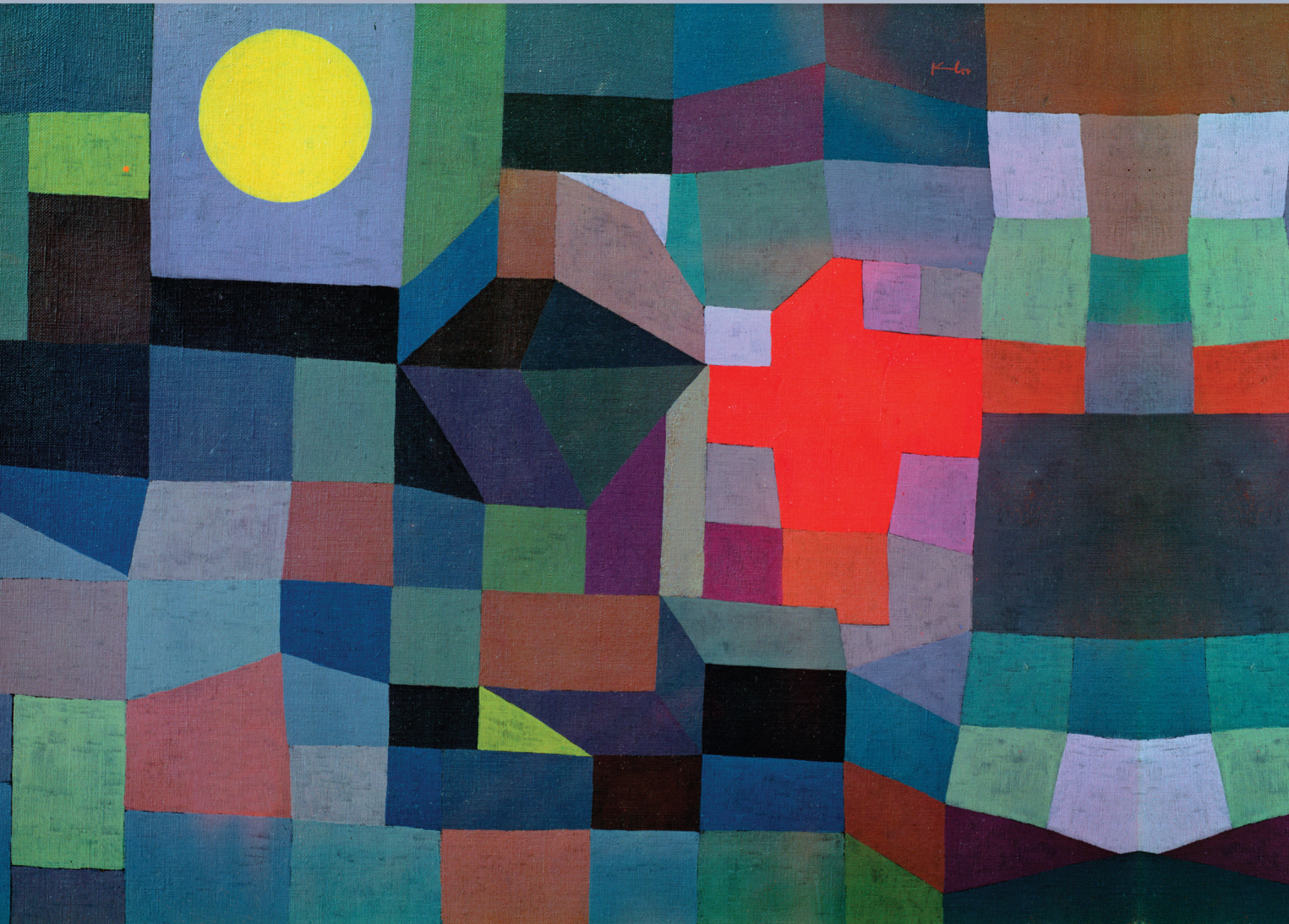


CECCHETTI AND SCHOENHOLTZ



# Money, Banking, and Financial Markets

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Fifth Edition

# Money, Banking, and Financial Markets

Fifth Edition

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## MONEY, BANKING, AND FINANCIAL MARKETS, FIFTH EDITION

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This book is printed on acid-free paper.

1 2 3 4 5 6 7 8 9 QVS 21 20 19 18 17 16

ISBN 978-1-259-74674-1

MHID 1-259-74674-7

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Cover Image: © *Paul Klee/Getty Images*

Compositor: *SPi Global*

Printer: *Quad/Versailles*

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### Library of Congress Cataloging-in-Publication Data

Names: Cecchetti, Stephen G. (Stephen Giovanni), author. | Schoenholtz, Kermit L., author.

Title: Money, banking, and financial markets / Stephen G. Cecchetti, Brandeis University,

Kermit L. Schoenholtz, Stern School of Business New York University.

Description: Fifth Edition. | Dubuque: McGraw-Hill Education, [2016] |

Revised edition of Money, banking, and financial markets, [2015] |

Includes index.

Identifiers: LCCN 2016038308 | ISBN 9781259746741 (alk. paper)

Subjects: LCSH: Money. | Banks and banking. | Finance. | Capital market.

Classification: LCC HG221 .C386 2016 | DDC 332—dc23 LC record available at

<https://lccn.loc.gov/2016038308>

# Dedication

To my father, Giovanni Cecchetti, who argued tirelessly that financial markets are not efficient; and to my grandfather Albert Schwabacher, who patiently explained why inflation is destructive.

*Stephen G. Cecchetti*

To my parents, Evelyn and Harold Schoenholtz, and my wife, Elvira Pratsch, who continue to teach me what is true, good, and beautiful.

*Kermit L. Schoenholtz*



## About the Authors



**Stephen G. Cecchetti** is Professor of International Economics at the Brandeis International Business School (<http://people.brandeis.edu/~cecchetti/>). He previously taught at Brandeis from 2003 to 2008. Before rejoining Brandeis in 2014, Cecchetti completed a five-year term as Economic Adviser and Head of the Monetary and Economic Department at the Bank for International Settlements in Basel, Switzerland. During his time at the Bank for International Settlements, Cecchetti was involved in numerous postcrisis global regulatory reform initiatives, including the work of the Basel Committee on Banking Supervision and the Financial Stability Board.

He has also taught at the New York University Leonard N. Stern School of Business and at The Ohio State University. In addition to his other appointments, Cecchetti served as Executive Vice President and Director of Research, Federal Reserve Bank of New York (1997–1999); Editor, *Journal of Money, Credit, and Banking* (1992–2001); Research Associate, National Bureau of Economic Research (1989–2011); and Research Fellow, Centre for Economic Policy Research (2008–present), among others.

Cecchetti's research interests include inflation and price measurement, monetary policy, macroeconomic theory, economics of the Great Depression, and the economics of financial regulation.

Cecchetti received an SB in Economics from the Massachusetts Institute of Technology in 1977 and a PhD in Economics from the University of California at Berkeley in 1982.



**Kermit L. Schoenholtz** is Professor of Management Practice in the Department of Economics of New York University's Leonard N. Stern School of Business, where he teaches courses on financial crises, money and banking, and macroeconomics (<http://pages.stern.nyu.edu/~kschoenh>). He also directs NYU Stern's Center for Global Economy and Business ([www.stern.nyu.edu/cgeb](http://www.stern.nyu.edu/cgeb)). Schoenholtz was Citigroup's global chief economist from 1997 until 2005.

Schoenholtz joined Salomon Brothers in 1986, working in their New York, Tokyo, and London offices. In 1997, he became chief economist at Salomon, after which he became chief economist at Salomon Smith Barney and later at Citigroup.

Schoenholtz has published extensively for the professional investment community about financial, economic, and policy developments; more recently, he has contributed to policy-focused scholarly research in economics. He is a member of the Financial Research Advisory Committee of the U.S. Treasury's Office of Financial Research, a panel member of the U.S. Monetary Policy Forum, and a member of the Council on Foreign Relations. He also has served as a member of the Executive Committee of the London-based Centre for Economic Policy Research.

From 1983 to 1985, Schoenholtz was a Visiting Scholar at the Bank of Japan's Institute for Monetary and Economic Studies. He received an MPhil in economics from Yale University in 1982 and an AB from Brown University in 1977.

# Preface

The world of money, banking, and financial markets is constantly evolving. Every year, people explore new ways to pay for purchases, save for the future, and borrow to meet current needs.

New technology is an ongoing source of change. Internet banking makes it easier than ever for individuals to take control of their finances. And smartphones not only allow American college students to pay for their morning coffee but also are giving hundreds of millions of people in poor countries their first access to the financial system.

In some instances, crises provided the impetus for change. For example, new regulations aimed at making the financial system safer have pushed many banks to take fewer risks than they did even five years ago. Financial markets also have become more resilient and less likely to need public support. And monetary policymakers, especially in places where economic growth has slowed and deflation is a risk, have adopted a slew of policies never seen before. In much of Europe and Japan, interest rates have fallen below zero—breaking through what had long been seen as a permanent barrier—while new policies are in place to boost bank lending and restore inflation and growth to precrisis levels.

The same things that are reshaping the global financial system also are transforming the study of money and banking. Some old questions are surfacing with new intensity: How can individuals use the changing financial system to improve their lives? How can governments ensure that the financial system remains stable? And how can monetary policymakers keep inflation low, employment high, and both of them stable?

Against this background, students who memorize the operational details of today's financial system are investing in a short-lived asset. Our purpose in writing this book is to focus on the basic functions served by the financial system while deemphasizing its current structure and rules. Learning the economic rationale behind current financial tools, rules, and structures is much more valuable than concentrating on the tools, rules, and structures themselves. It is an approach designed to give students the lifelong ability to understand and evaluate whatever financial innovations and developments they may one day confront.

## The Core Principles Approach

Toward that end, the entire content of this book is based on five *core principles*. Knowledge of these principles is the basis for understanding what the financial system does, how it is organized, how it is linked to the real economy, and how it is changing. If you understand these five principles, you will understand the future:

1. Time has value.
2. Risk requires compensation.
3. Information is the basis for decisions.
4. Markets determine prices and allocate resources.
5. Stability improves welfare.

These five core principles serve as a framework through which to view the history, current status, and future development of money and banking. They are discussed in

detail in Chapter 1; throughout the rest of the text, marginal icons remind students of the principles that underlie particular discussions.

Focusing on core principles has created a book that is both concise and logically organized. This approach does require some adjustments to the traditional methodology used to teach money and banking, but for the most part they are changes in emphasis only. That said, some of these changes have greatly improved both the ease of teaching and the value students draw from the course. Among them are the emphasis on risk and on the lessons from the financial crisis; use of the term *financial instrument*; parallel presentation of the Federal Reserve and the European Central Bank; a streamlined, updated section on monetary economics; and the adoption of an integrated global perspective.

## Innovations in This Text

In addition to the focus on core principles, this book introduces a series of innovations designed to foster coherence, relevance, and timeliness in the study of money and banking.

### The Money and Banking Blog

The global economy and financial system of the 21st century is evolving quickly. Changes in technology, in the structure of financial institutions and markets, and in monetary and regulatory policy are occurring at a pace that far outstrips the normal three- or four-year cycle at which textbooks are revised. To keep examples and applications current, we have introduced the *Money and Banking* blog. Available at [www.moneyandbanking.com](http://www.moneyandbanking.com), the blog provides timely commentary on events in the news and on questions of more lasting interest.

The blog is closely linked to this book. Like the book, it aims to enhance students' understanding of the world around them. Based on the five core principles of money and banking, each blog entry is associated with a specific chapter. Students following the blog will learn how current events affect the various parts of the financial system—money, financial instruments, financial markets, financial institutions, financial regulators, and central banks.

Starting with the fifth edition, the material from the blog is integrated into the book in two ways. First, each chapter includes an “In the Blog” boxed reading. These are short versions of postings that have appeared on [www.moneyandbanking.com](http://www.moneyandbanking.com) since the publication of the previous edition of this book. These excerpts describe current issues that highlight the lessons in the body of the chapter. Second, the website includes a listing of the posts by chapter. This listing allows students and instructors alike to find new, up-to-date material that illustrates the lessons and core principles emphasized in each chapter.

To receive the latest commentary as it is posted every week or so, subscribe to the blog at [www.moneyandbanking.com](http://www.moneyandbanking.com). You can also follow the authors on Twitter (@MoneyBanking1).



### Federal Reserve Economic Data (FRED)

*Money, Banking, and Financial Markets* systematically integrates the use of economic and financial data from FRED, the online database provided free of charge to the public by the Federal Reserve Bank of St. Louis. As of this writing, FRED offers more than 400,000 data series from 80 sources, including indicators for about 200 countries. Information on using FRED appears in Appendix B to Chapter 1 and at [www.mhhe.com/moneyandbanking5e](http://www.mhhe.com/moneyandbanking5e) (refer to the FRED Resources).

Through frequent use of FRED, students will gain up-to-date knowledge of the U.S. and other economies and an understanding of the real-world challenges of economic measurement; they will also gain skills in analysis and data manipulation that will serve them well for years to come. Many of the graphs in this book were produced (and can be easily updated) using FRED. In addition, end-of-chapter Data Exploration problems call on students to use FRED to analyze key economic and financial indicators highlighted in that chapter. (For detailed instructions for using FRED online to answer the Data Exploration problems in Chapters 1 to 10, visit [www.mhhe.com/moneyandbanking5e](http://www.mhhe.com/moneyandbanking5e) and click on Data Exploration Hints.) Students can even do some assignments using the FRED app for their mobile devices.

## Impact of the Crises

The effects of the global financial crisis of 2007–2009 and the euro-area crisis that began in 2010 are transforming money, banking, and financial markets. Accordingly, from beginning to end, the book integrates the issues raised by these crises and by the responses of policymakers.

The concept of a liquidity crisis surfaces in Chapter 2, and the risks associated with leverage and the rise of shadow banking are introduced in Chapter 3. Issues specific to the 2007–2009 crisis—including securitization, rating agencies, subprime mortgages, over-the-counter trading, and complex financial instruments like credit-default swaps—are included in the appropriate intermediate chapters of the text. Chapter 16 explores the role of the European Central Bank in managing the euro-area crisis. More broadly, the sources of threats to the financial system as a whole are identified throughout the book, and there is a focused discussion on regulatory initiatives to limit such systemic threats. Finally, we present—in a logical and organized manner—the unconventional monetary policy tools, including the use of negative interest rates and the concept of the effective lower bound, that have become so prominent in postcrisis policy debates and remain relevant today.

## Early Introduction of Risk

It is impossible to appreciate how the financial system works without understanding risk. In the modern financial world, virtually all transactions transfer some degree of risk between two or more parties. These risk trades can be extremely beneficial, as they are in the case of insurance markets. But there is still potential for disaster. In 2008, risk-trading activity at some of the world’s largest financial firms threatened the stability of the international financial system.

Even though risk is absolutely central to an understanding of the financial system, most money and banking books give very little space to the topic. In contrast, this book devotes an entire chapter to defining and measuring risk. Chapter 5 introduces the concept of a risk premium as compensation for risk and shows how diversification can reduce risk. Because risk is central to explaining the valuation of financial instruments, the role of financial intermediaries, and the job of central bankers, the book returns to this concept throughout the chapters.

## Emphasis on Financial Instruments

Financial instruments are introduced early in the book, where they are defined based on their economic function. This perspective leads naturally to a discussion of the uses



of various instruments and the determinants of their value. Bonds, stocks, and derivatives all fit neatly into this framework, so they are all discussed together.

This approach solves one of the problems with existing texts, use of the term *financial market* to refer to bonds, interest rates, and foreign exchange. In its conventional microeconomic sense, the term *market* signifies a place where trade occurs, not the instruments that are traded. This book follows standard usage of the term *market* to mean a place for trade. It uses the term *financial instruments* to describe virtually all financial arrangements, including loans, bonds, stocks, futures, options, and insurance contracts. Doing so clears up the confusion that can arise when students arrive in a money and banking class fresh from a course in the principles of economics.

## Parallel Presentation of the Federal Reserve and the European Central Bank

To foster a deeper understanding of central banking and monetary policy, the presentation of this material begins with a discussion of the central bank's role and objectives. Descriptions of the Federal Reserve and the European Central Bank follow. By starting on a theoretical plane, students gain the tools they need to understand how all central banks work. This avoids focusing on institutional details that may quickly become obsolete. Armed with a basic understanding of what central banks do and how they do it, students will be prepared to grasp the meaning of future changes in institutional structure.

Another important innovation is the parallel discussion of the two most important central banks in the world, the Federal Reserve and the European Central Bank (ECB). Students of the 21st century are ill-served by books that focus entirely on the U.S. financial system. They need a global perspective on central banking, the starting point for which is a detailed knowledge of the ECB.

## Modern Treatment of Monetary Economics

The discussion of central banking is followed by a simple framework for understanding the impact of monetary policy on the real economy. Modern central bankers think and talk about changing the interest rate when inflation deviates from its target and output deviates from its normal level. Yet traditional treatments of monetary economics employ aggregate demand and aggregate supply diagrams, which relate output to the *price level*. Our approach is consistent with that in the most recent editions of the leading macroeconomics textbooks and directly links output to *inflation*, simplifying the exposition and highlighting the role of monetary policy. Because this book also skips the IS-LM framework, its presentation of monetary economics is several chapters shorter. Only those topics that are most important in a monetary economics course are covered: long-run money growth and inflation and short-run monetary policy and business cycles. This streamlined treatment of monetary theory is not only concise but more modern and more relevant than the traditional approach. It helps students to see monetary policy changes as part of a strategy rather than as one-off events, and it gives them a complete understanding of business cycle fluctuations.

## Integrated Global Perspective

Technological advances have dramatically reduced the importance of a bank's physical location, producing a truly global financial system. Twenty years ago money and

banking books could afford to focus primarily on the U.S. financial system, relegating international topics to a separate chapter that could be considered optional. But in today's financial world, even a huge country like the United States cannot be treated in isolation. The global financial system is truly an integrated one, rendering separate discussion of a single country's institutions, markets, or policies impossible. This book incorporates the discussion of international issues throughout the text, emphasizing when national borders are important to bankers and when they are not.

## Organization

This book is organized to help students understand both the financial system and its economic effects on their lives. That means surveying a broad series of topics, including what money is and how it is used; what a financial instrument is and how it is valued; what a financial market is and how it works; what a financial institution is and why we need it; and what a central bank is and how it operates. More important, it means showing students how to apply the five core principles of money and banking to the evolving financial and economic arrangements that they inevitably will confront during their lifetimes.

**Part I: Money and the Financial System.** Chapter 1 introduces the core principles of money and banking, which serve as touchstones throughout the book. It also presents FRED, the free online database of the Federal Reserve Bank of St. Louis. The book often uses FRED data for figures and tables, and every chapter calls on students to use FRED to solve end-of-chapter problems. Chapter 2 examines money both in theory and in practice. Chapter 3 follows with a bird's-eye view of financial instruments, financial markets, and financial institutions. (Instructors who prefer to discuss the financial system first can cover Chapters 2 and 3 in reverse order.)

**Part II: Interest Rates, Financial Instruments, and Financial Markets.** Part II contains a detailed description of financial instruments and the financial theory required to understand them. It begins with an explanation of present value and risk, followed by specific discussions of bonds, stocks, derivatives, and foreign exchange. Students benefit from concrete examples of these concepts. In Chapter 7 (The Risk and Term Structure of Interest Rates), for example, students learn how the information contained in the risk and term structure of interest rates can be useful in forecasting. In Chapter 8 (Stocks, Stock Markets, and Market Efficiency), they learn about stock bubbles and how those anomalies influence the economy. And in Chapter 10 (Foreign Exchange), they study the Big Mac index to understand the concept of purchasing power parity. Throughout this section, two ideas are emphasized: that financial instruments transfer resources from savers to investors, and that in doing so, they transfer risk to those best equipped to bear it.

**Part III: Financial Institutions.** In Part III, the focus shifts to financial institutions. Chapter 11 introduces the economic theory that is the basis for our understanding of the role of financial intermediaries. Through a series of examples, students see the problems created by asymmetric information as well as how financial intermediaries can mitigate those problems. The remaining chapters in Part III put theory into practice. Chapter 12 presents a detailed discussion of banking, the bank balance sheet, and the risks that banks must manage. Chapter 13 provides a brief overview of the financial industry's structure, and Chapter 14 explains financial regulation, including a discussion of regulation to limit threats to the financial system as a whole.

### **Part IV: Central Banks, Monetary Policy, and Financial Stability.**

Chapters 15 through 19 survey what central banks do and how they do it. This part of the book begins with a discussion of the role and objectives of central banks, which leads naturally to the principles that guide central bank design. Chapter 16 applies those principles to the Federal Reserve and the European Central Bank, highlighting the strategic importance of their numerical inflation objectives and their communications. Chapter 17 presents the central bank balance sheet, the process of multiple deposit creation, and the money supply. Chapters 18 and 19 cover operational policy, based on control of both the interest rate and the exchange rate. Chapter 18 also introduces the monetary transmission mechanism and presents a variety of unconventional monetary policy tools, including negative interest rates and the concept of the effective lower bound, that have become so prominent in recent years. The goal of Part IV is to give students the knowledge they will need to cope with the inevitable changes that will occur in central bank structure.

### **Part V: Modern Monetary Economics.**

The last part of the book covers modern monetary economics. While most books cover this topic in six or more chapters, this one does it in four. This streamlined approach concentrates on what is important, presenting only the essential lessons that students truly need. Chapter 20 sets the stage by exploring the relationship between inflation and money growth. Starting with inflation keeps the presentation simple and powerful, and emphasizes the way monetary policy-makers think about what they do. A discussion of aggregate demand, aggregate supply, and the determinants of inflation and output follows. Consistent with the presentation in recent editions of leading macroeconomic textbooks, Chapter 21 presents a complete macroeconomic model with a dynamic aggregate demand curve that integrates monetary policy directly into the presentation, along with short- and long-run aggregate supply curves. In Chapter 22 the model is used to help understand the sources of business cycles, as well as a number of important applications that face monetary policymakers in the world today. Each application stands on its own, and the applications are ordered in increasing difficulty to allow maximum flexibility in their use. Finally, Chapter 23 explores the monetary transmission mechanism in some detail and addresses key challenges facing central banks, such as asset price bubbles, the effective lower bound for nominal rates, and the evolving structure of the financial system.

For those instructors who have the time, we recommend closing the course with a rereading of the first chapter and a review of the core principles. What is the future likely to hold for the six parts of the financial system: money, financial instruments, financial markets, financial institutions, regulatory agencies, and central banks? How do students envision each of these parts of the system 20 or even 50 years from now?

## **Organizational Alternatives**

While this book greatly streamlines the traditional approach to money and banking, it remains flexible enough to be used in a broad variety of courses; up to 19 of the book's 23 chapters can be assigned in the following courses:

*General Money and Banking Course.* Chapters 1–8, 11, 12, 15, 16, the first section of 17 (through page 463), 18, and 20–22

This course covers the primary material needed to appreciate the connections between the financial system and the economy.

*General Money and Banking Course with International Emphasis.* Chapters 1–8, 10–12, 15–19, and 20

This alternative to the general money and banking course substitutes chapters on foreign exchange and exchange-rate policy for the macroeconomic model included in courses with less international emphasis.

*Financial Markets and Institutions.* Chapters 1–9, 11–18

The traditional financial markets and institutions course covers money, financial instruments and markets, financial institutions, and central banking. The focus is on Parts II and III of the book.

*Monetary Economics and Monetary Policy.* Chapters 1–7, 10–12, 15–23

A course called monetary economics and monetary policy uses the material in Parts II and III as a foundation for understanding the material in Parts IV and V.

A half-semester course for students with a background in financial instruments and institutions might cover only Chapters 1–3 and 15–23.

## What's New in the Fifth Edition?

Many things have happened since the last edition. For that reason, all of the figures and data have been updated to reflect the most recent available information. In addition, the authors have made major changes to enhance the fifth edition of *Money, Banking, and Financial Markets*. In quantity terms, the changes in this edition are the most extensive since the first edition was published in 2005. What follows is only a sample of these changes.

### New Topics in the Integrated Global Perspective

The fifth edition reflects the wide range of monetary and regulatory developments that have taken place since 2015. New topics introduced or discussed in much greater detail include:

- The role of paper money and virtual currencies
- Mobile banking and financial inclusion
- Peer-to-peer lending
- Bond market liquidity
- Conflicts of interest in finance
- Reforming LIBOR
- High-frequency trading
- Stress testing banks to ensure resilience
- The size of central bank balance sheets
- Negative interest rates
- Chinese exchange-rate policy
- Narrow banking
- Big data and the macroeconomy
- Secular stagnation

The most extensive changes are in Chapter 14, which includes a discussion of continued reforms to financial regulation in the aftermath of the financial crisis; Chapter 18, which includes a full treatment of the Federal Reserve's new operational policy regime; and Chapters 21 and 22, where the macroeconomic model has been further enhanced so that it now conforms to the recently revised treatment in leading intermediate macroeconomics textbooks.

### Changes at the Federal Reserve and the ECB

The discussion of the Federal Reserve and the ECB now considers their evolving communications strategy (Chapter 16); the use of unconventional policy tools, including negative interest rates and the dramatic growth in central bank balance sheets, aimed



at addressing first the financial crisis and then the weak economic recoveries that followed (Chapter 18); the interactions between monetary policy and financial stability (Chapter 18); and the impairment of the monetary transmission process during the crisis (Chapter 23). It also reflects recent challenges to Fed independence, including the role of central bank capital (Chapter 15).

## Updated Coverage of Current Events

The biggest change since the fourth edition is the new and updated Learning Tools inserts. Each chapter now contains an In the Blog excerpt from the authors' *Money and Banking* blog ([www.moneyandbanking.com](http://www.moneyandbanking.com)). In addition, one-quarter of the other features have been updated. Overall, more than 50 of the 140 inserts in the previous edition have been replaced or altered substantially. These changes capture new developments in the key areas of technological change, the financial crisis, regulatory reform, and monetary policy.

Here is a partial list of the new features:

### **In the Blog**

- Virtual Frenzies: Bitcoin and the Blockchain (Chapter 2)
- Banking the Masses (Chapter 3)
- Bond Market Liquidity: Should We Be Worried (Chapter 6)
- In Search of Better Credit Assessments (Chapter 7)
- To RMB or not to RMB? Lessons from Currency History (Chapter 10)
- The Cloudy Future of Peer-to-Peer Lending (Chapter 12)
- Narrow Banks Won't Stop Bank Runs (Chapter 14)
- Do Central Banks Need Capital? (Chapter 15)
- How Big Should Central Balance Sheets Be? (Chapter 18)
- Is 2 Percent Still the Right Inflation Target? (Chapter 22)
- A Guide to "Secular Stagnation" (Chapter 23)

### **Applying the Concept**

- Basics of High-Frequency Trading (Chapter 3)
- How Much Is the Distant Future Worth? (Chapter 4)
- Do U.S. Households Benefit When Growth Is Stable? (Chapter 5)
- China's Stock Market Boom and Bust (Chapter 8)
- Truth or Consequences: Ponzi Schemes and Other Frauds (Chapter 11)
- Shadow Banking in China (Chapter 12)
- Reforming LIBOR (Chapter 13)
- Negative Nominal Interest Rates: Blast from the Past? (Chapter 17)
- Alternative Monetary Policy Targets: Inflation, Price Level, and Nominal GDP (Chapter 18)

### **Your Financial World**

- Why You Are Obligated to Buy Health Insurance (Chapter 13)
- Making Finance Safe (Chapter 14)
- Has Paper Money Outlived Its Purpose? (Chapter 17)
- Is International Diversification Dead? (Chapter 19)

### **Lessons from the Crisis**

- Threats to Fed Independence (Chapter 15)
- The Euro-Area Crisis and the ECB (Chapter 16)
- The Financial Stability–Monetary Policy Nexus (Chapter 18)

## Learning Tools

In a sense, this book is a guide to the principles students will need to critically evaluate and use what they read in the financial press. Reading a newspaper or a blog and applying the information it contains require some basic knowledge. Supplying that knowledge is the purpose of the five types of inserts that complement the chapters, providing a break from the more technical material in the body of the text:

- **Applying the Concept**
- **In the Blog**
- **Lessons from the Crisis**
- **Tools of the Trade**
- **Your Financial World**

For a complete listing of the boxed features and their page references, refer to the detailed table of contents. At the start of each chapter, the book now includes more comprehensive *learning objectives*, to which the end-of-chapter problems are linked.

The end-of-chapter material is divided into five sections: *Key Terms*, *Chapter Lessons*, *FRED Data Codes*, *Conceptual and Analytical Problems*, and *Data Exploration*. Key Terms lists all the technical terms introduced and defined in the chapter. The key terms are defined in full in the glossary at the end of the book. To aid student comprehension and retention, Chapter Lessons lists key lessons in an outline that matches the chapter's headings.

For a detailed description of FRED Data Codes, Data Exploration material, and Conceptual and Analytical Problems, as well as the aforementioned boxed features, please refer to the walkthrough on the pages that follow.

## Supplements for Instructors

The following ancillaries are available for quick download and convenient access via the Instructor Resource material available through McGraw-Hill Connect<sup>®</sup>.

### Solutions Manual

Prepared by James Fackler (University of Kentucky) and Roisin O'Sullivan (Smith College), this manual contains detailed solutions to the end-of-chapter questions—Conceptual and Analytical Problems and Data Exploration Problems.

### Test Bank

The revised test bank of more than 2,500 multiple-choice and 600 short-answer and essay questions. The test bank can be used both as a study guide and as a source for exam questions. It has been computerized to allow for both selective and random generation of test questions.

### PowerPoint Slides

Updated presentation slides outline the main points in each chapter and reproduce major graphs and charts. This handy, colorful supplement can be edited, printed, or rearranged to fit the needs of your course.

# Learning Tools Walkthrough

## Learning Objectives

The learning objectives (LOs) introduced at the start of each chapter highlight the material and concepts to be mastered. Every end-of-chapter problem is denoted by the LO to which it relates for reinforcement.

### Learning Objectives

After reading this chapter, you should be able to:

- LO1** Explain what financial instruments are, how they are used, and how they are valued.
- LO2** Discuss the role and structure of financial markets and identify the characteristics of a well-run financial market.
- LO3** Describe the role of financial institutions and structure of the financial industry.

## Core Principle Icons

The entire text discussion is organized around the following five core principles: *Time* has value; *risk* requires compensation; *information* is the basis for decisions; *markets* set prices and allocate resources; and *stability* improves welfare. Exploring these principles is the basis for learning what the financial system does, how it is organized, and how it is linked to the real economy. They are discussed in detail in Chapter 1; throughout the rest of the text, marginal icons remind students of the principles that underlie particular discussions.

any way that one might want.<sup>3</sup> When you encounter a financial instrument for the first time, try to figure out whether it is used primarily for storing value or for transferring risk. Then try to identify which characteristics determine its value.



### Financial Markets

**Financial markets** are the places where financial instruments are bought and sold. They are the economy's central nervous system, relaying and reacting to information quickly, allocating resources, and determining prices. In doing so, financial markets

<sup>3</sup>For an introduction to how asset-backed securities work, see Andreas Jobst, "What Is Securitization?" *Finance and Development*, International Monetary Fund, September 2008.

## Lessons from the Crisis

These boxes explain concepts or issues that are both integral to the chapter and central to understanding how the financial crisis of 2007–2009 and the subsequent crisis in the euro area transformed the world of money, banking, and financial markets. The topics range from specific aspects of the crisis such as shadow banks and central bank policy responses to broad concepts like liquidity, leverage, sovereign default, and systemic risk.



### LESSONS FROM THE CRISIS SHADOW BANKS

Over the past few decades, financial intermediation and leverage in the United States has shifted away from traditional banks<sup>4</sup> and toward other financial institutions that are less subject to government rules. These other intermediaries include brokerages, consumer and mortgage finance firms, insurers, investment organizations (such as hedge funds and private equity firms), money-market mutual funds (MMMFs), and even bank-created asset management firms, such as special investment vehicles (SIVs).

These other intermediaries have come to be known as shadow banks because they provide services that compete with or substitute for those supplied by traditional banks. Unlike banks, however, shadow banks do not accept deposits. In addition, the leverage and risk taking of shadow banks can be greater than that of traditional banks while being less transparent.

Beginning in the 1970s, financial innovation sped the shift of intermediation to the shadow banks and was, in turn, stimulated by it. Broader markets, plunging information costs, new profit opportunities, and government practices all encouraged the development of new financial instruments

risks at low cost (see Chapter 9). After 2000, the use of customized derivatives that do not trade in open markets (so-called over-the-counter, or OTC, derivatives) rose dramatically. Those derivatives permitted some large financial institutions to take risks that were unknown to their investors and trading partners and to the public officials who were supposed to monitor them. The spillover from the failure of these firms during the financial crisis nearly sank the entire system.

The financial crisis of 2007–2009 transformed shadow banking. During the fateful week that began with the failure of Lehman Brothers on Monday, September 15, 2008, the largest U.S. brokerages failed, merged, or converted themselves into traditional banks in order to secure access to funding. In the same month, the loss of confidence in MMMFs required a U.S. government guarantee to halt withdrawals. During the crisis, many SIVs failed or were reabsorbed by the banks that created them. Many hedge funds chose to shrink or close as investors fled.

The future of shadow banking remains highly uncertain. The crisis has encouraged governments to scrutinize any financial institution that could, by its risk taking, pose a threat to the financial system. Partly as a result, the scope for leverage and risk taking is lower for now, but incentives to take risk—at others' expense—still can fuel future disruptions.

## YOUR FINANCIAL WORLD

### Debit Cards versus Credit Cards

When you go shopping, should you pay with a credit card or a debit card? To decide, you need to understand the difference between the two. First make sure you know which one of your cards is which. Usually an ATM card (the one that you got from the bank when you opened your checking account) is a debit card. But check to make sure.

What's the real difference, from the shopper's point of view? A debit card works just like a check—only faster. When you write a paper check, it usually takes a day or two to go through the system. A debit card transaction goes through right away. The electronic message gets to your bank on the same day, and your account is debited immediately. So, if you want to use your debit card, your account balance has to be higher than the payment you want to make. During and after the financial crisis that began in 2007, debit card use sharply outpaced credit card activity, as lenders and borrowers sought to slow the expansion (or even reduce the outstanding level) of household debt.

A credit card creates a deferred payment. The issuer agrees to make the payment for you, and you repay the debt later. That sounds good, but there's a catch. If you're late paying, there's a late fee. And if you don't pay the entire debt every month, you pay interest on the balance—at what is usually a very high interest rate. If you do pay your entire credit card debt every month, however, there is no late fee and no interest charge. Hence, you get an interest-free loan from the time you make the purchase to the time you pay the balance. If you can pay off your credit cards in full and on time, it's to your advantage to use them.

Credit cards have another advantage over debit cards. They help you to build a credit history, which you'll need when the time comes to buy a car or a house. Because debit cards are just extensions of your bank account, they don't show potential lenders that you are creditworthy. In fact, some businesses, like car rental companies, require their customers to use credit cards for this reason.

## Your Financial World

These boxes show students that the concepts taught in the text are relevant to their everyday lives. Among the topics covered are the importance of saving for retirement, the risk in taking on a variable-rate mortgage, the desirability of owning stocks, and techniques for getting the most out of the financial news.



## IN THE BLOG

### Virtual Frenzies: Bitcoin and the Block Chain

Bitcoin is one of several new “virtual currency schemes” that devotees hope will revolutionize everyday payments. By one definition, Bitcoin is “a decentralized peer-to-peer network that allows for the proof and transfer of ownership without the need for a trusted third party.”\* The technology used to record Bitcoin ownership—the block chain—is an ever-growing public ledger of transactions that is encrypted and distributed over a network of computers. Promoters of the block chain technology believe that it will have broad applications in supporting payments in any currency.

Advocates view Bitcoin as a new form of digital money with two important advantages: (1) its value cannot be undermined by government fiat (because its value is created and controlled by the network of users and a set of unchanging rules, not by government), and (2) its users can remain

transactions globally, compared with more than 500 million in the United States alone.

Bitcoin’s value is extremely unstable: the dollar value of a single Bitcoin surged from just pennies in 2010 to nearly \$1.150 at the peak in 2013, before plunging back below \$300 for most of 2015. Since 2012, the *daily* percentage change in Bitcoin’s U.S. dollar value has ranged from –31 percent to +42 percent. Had Bitcoin been employed as a unit of account over this period, all other prices would have been subject to enormous day-to-day swings.

Bitcoin’s use was initially fed by those seeking anonymity—including money launderers, tax evaders, and drug traffickers. Perhaps the most notorious users of Bitcoin were participants in the online black market known as Silk Road, which the U.S. government shut down in 2013. In 2015, most Bitcoin currency transactions were against China’s

## In the Blog

One article per chapter is featured from the authors’ blog at [www.moneyandbanking.com](http://www.moneyandbanking.com). These readings show how concepts introduced in the chapter are applied to contemporary issues in money and banking, including changes in technology, regulation, and the mechanisms of monetary policy.



### APPLYING THE CONCEPT HOW MUCH IS OUR DISTANT FUTURE WORTH?

Many people worry about the challenges their descendants will face. There are plenty of things to fret about, ranging from the threat of rising sea levels in this century to the long-range challenge of managing radioactive waste, which can be toxic for many thousands of years. Physicist Stephen Hawking has argued that human beings “won’t survive another 1,000 years without escaping our fragile planet.”

How much ought we be willing to spend now to avoid damage 100 years from now that will cost \$1 at that time? The answer depends on many factors, including the relative affluence of our descendants, the degree of uncertainty about the future, and the possibility of existential threats.

To simplify the question, suppose that the only thing we care about is the present value of the expected losses associated with a preventable future disaster. In that case, the discount rate we use is critical for determining what we should do today. For example, for a disaster that is 100 years away, the value today of a \$1 future loss at an annual discount rate of 1 percent is \$0.37. But at a discount rate of 2 percent, the present value drops to \$0.14. And at 4 percent, it is less than

\$0.02. Spending more than these amounts today would not make economic sense.

What discount rate should we use to value things in the distant future? For questions like this, economists usually look at market prices.

One possibility is to adjust the yield on ultra-long-term debt—like British consols, which never repay principal—for the level of inflation. In 2014, the consol with a coupon of 2½ percent (first issued in 1751) yielded on average just over 4 percent. Assuming inflation of 2 percent, that is equivalent to a discount rate of about 2 percent.

Policy disagreements among serious analysts of climate change are closely related to their views on the appropriate discount rate. One well-known report applied a relatively low discount rate of 1.4 percent and called for a large tax on carbon emissions to limit future losses from climate change. A different analysis used a relatively high 4.3 percent discount rate and called for a carbon tax only about one-tenth the level implied by the 1.4 percent rate analysis. Why? The low discount rate puts a great deal more weight on losses that are predicted to occur hundreds of years in the future.

Of course, it’s not just about discount rates. It’s about the scale of future losses, too. If policy actions today can prevent a calamity that threatens life on earth, then people might judge the appropriate discount rate to be quite low because they would not weight the value of future lives any lower than their own.

## Applying the Concept

These sections showcase history and examine issues relevant to the public policy debate to illustrate how ideas introduced in the chapter can be applied to the world around us. Subjects include the LIBOR scandal; why Long-Term Capital Management caused a near collapse of the world financial system; and what monetary policymakers learned from the Great Depression of the 1930s.



## TOOLS OF THE TRADE

### The Consumer Price Index

Understanding how to measure inflation is central to understanding economics and finance. Most of us keep a close eye on measures like the consumer price index (CPI) to help gauge the value of our salary increases or the purchasing power of the money we hold. And adjusting interest rates for inflation is critical for making investment decisions. (See Chapter 4.)

The CPI is designed to answer the following question: How much more would it cost for people to purchase today the same basket of goods and services that they actually bought at some fixed time in the past?

To calculate the CPI, every few years statisticians at the Bureau of Labor Statistics (BLS) survey people to find out what they bought. This gives us the basket of goods and services bought by the typical consumer. Next, every month the BLS collects information on the prices of thousands of goods and services—everything from breakfast cereal to gasoline to washing machines to the cost of cable television. Combining the expenditure and price surveys allows statisticians to compute the current cost of the basket. Finally, this current cost is compared to a benchmark to yield an index. And the percentage change in this index is a measure of inflation.

To see how this works, let’s look at an example. Assume people spend 25 percent of their income on food, 50 percent on housing, and 25 percent on transportation. That’s the survey information. Examples of the prices are in Table 2.2. Importantly, these are the prices of exactly the same bundle of food, the same size and quality of housing, and the same transportation for each year.

Using the numbers in Table 2.2 we can compute the cost of the basket of goods in each year:

$$\begin{aligned} \text{Cost of the basket in 2017} &= 0.25 \times \text{Price of food} + 0.5 \times \text{Price of housing} \\ &\quad + 0.25 \times \text{Price of transportation} \\ &= 0.25 \times \$100 + 0.5 \times \$200 + 0.25 \times \$100 \\ &= \$150 \end{aligned}$$

Table 2.2 Computing the Consumer Price Index

Year	Price of Food	Price of Housing	Price of Transportation	Cost of the Basket	Consumer Price Index
2017	\$100	\$200	\$100	\$150	100
2018	110	205	140	165	110
2019	120	210	180	180	120

And for 2018, we get \$165. Choosing 2017 as the base year, the index level in each year equals

$$\text{CPI} = \frac{\text{Cost of the basket in current year}}{\text{Cost of the basket in base year}} \times 100$$

The result of this computation is the fifth column of the table. Finally, we can use the index number to compute the inflation rate from the previous year. From 2017 to 2018, this means that

$$\text{Inflation rate 2018} = \frac{\text{CPI in 2018} - \text{CPI in 2017}}{\text{CPI in 2017}}$$

Using the numbers from Table 2.2 to compute the inflation rate in 2018, we get that

$$\frac{110 - 100}{100} \times 100 = 10\%$$

and for 2019 the result is

$$\frac{120 - 110}{110} \times 100 = 9.1\%$$

(These numbers are just for illustration. The U.S. inflation rate is closer to 2 percent.)

Inflation measured using the CPI tells us how much more money we need to give people to restore the purchasing power they had in the earlier period when the survey was done. But adjustments in wages based on fixed-expenditure-weight inflation indexes like the CPI are known to overcompensate people in an unintended way. This overstatement of inflation comes from what is known as substitution bias. Because inflation is not uniform, the prices of some products will increase by more than the prices of others. People can escape some of the inflation by substituting goods and services that have sustained less inflation for those that have sustained more. By assuming that any substitution makes people worse off, the index overstates the impact of price changes. To address this problem, and take into account changes in spending patterns, the Bureau of Labor Statistics in 2002 began changing the weights every two years. Nevertheless, many economists believe that the CPI still overstates inflation.

## Tools of the Trade

These boxes teach useful skills, including how to read bond and stock tables, how to read charts, and how to do some simple algebraic calculations. Some provide brief reviews of material from the principles of economics course, such as the relationship between the current account and the capital account in the balance of payments.



# End-of-Chapter Features

## Using FRED: Codes for Data in This Chapter

Data Series	FRED Data Code
Price of gold (U.S. dollars)	GOLDAMGBD228NLBM
Consumer price index	CPIAUCSL
M1	M1SL
M2	M2SL
Currency in circulation	CURRSL
Traveler's checks	TVCKSSL
Demand deposits	DEMDEPSL
Other checkable deposits	OCDSL
Small-denomination time deposits	STDCBSL
Savings deposits and MMDAs*	SAVINGSL
Retail MMMFs**	RMFSL
Nominal GDP	GDP

\*Money market deposit accounts

\*\*Money market mutual funds

## FRED Data Codes

The FRED table lists key economic and financial indicators relevant to the chapter and the codes by which they are accessed in FRED, the free online database provided by the Federal Reserve Bank of St. Louis. With the data codes, students can use FRED to analyze key economic patterns and illuminate the ideas in the chapter. See Appendix B to Chapter 1 for help using FRED.

## Data Exploration

New, detailed end-of-chapter questions ask students to use FRED to analyze economic and financial data relevant to the chapter. Appendix B to Chapter 1 provides information on using FRED and sets the stage for its use thereafter.



## Data Exploration

For detailed instructions on using Federal Reserve Economic Data (FRED) online to answer each of the following problems, visit [www.mhhe.com/moneyandbanking5e](http://www.mhhe.com/moneyandbanking5e) and refer to the FRED Resources and Data Exploration Hints.

1. Find the most recent level of M2 (FRED code: M2SL) and of the U.S. population (FRED code: POP). Compute the quantity of money divided by the population. (Note that M2 is measured in billions of dollars and population is in thousands of individuals.) Do you think your answer is large? Why? (LO1)
2. Reproduce Figure 2.3 from 1960 to the present, showing the percent change from a year ago of M1 (FRED code: M1SL) and M2 (FRED code: M2SL). Comment on the pattern over the last five years. Would it matter which of the two monetary aggregates you looked at? (LO4)
3. Which usually grows faster: M1 or M2? Produce a graph showing M2 divided by M1. When this ratio rises, M2 outpaces M1 and vice versa. What is the long-run pattern? Is the pattern stable? (LO4)
4. Traveler's checks are a component of M1 and M2. Produce a graph of this component of the monetary aggregates (FRED code: TVCKSSL). Explain the pattern you see. (LO1)

## Conceptual and Analytical Problems

1. Describe at least three ways you could pay for your morning cup of coffee. What are the advantages and disadvantages of each? (LO2)
2. You are the owner of a small sandwich shop. A buyer may offer one of several payment methods: cash, a check drawn on a bank, a credit card, or a debit card. Which of these is the least costly for you? Explain why the others are more expensive. (LO2)
3. Explain how money encourages specialization, and how specialization improves everyone's standard of living. (LO4)
- 4.\* Could the dollar still function as the unit of account in a totally cashless society? (LO2)
5. Give four examples of ACH transactions you might make. (LO2)
6. As of July 2016, 19 European Union countries have adopted the euro, while the remaining member countries have retained their own currencies. What are the advantages of a common currency for someone who is traveling through Europe? (LO1)
7. Why might each of the following commodities not serve well as money? (LO2)
  - a. Tomatoes
  - b. Bricks
  - c. Cattle

## Conceptual and Analytical Problems

Each chapter contains at least 18 conceptual and analytic problems at varying levels of difficulty, which reinforce the lessons in the chapter. All of the problems are available as assignable content within Connect, McGraw-Hill's homework management platform, organized around learning objectives to make it easier to plan, track, and analyze student performance across different learning outcomes.

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## Acknowledgments

I owe thanks to many more people than I can possibly list, including a large number of academics, central bankers, and financial market participants around the world. A few of these deserve special mention. I would like to thank Robert M. Solow, who set me on the path doing economics as a 20-year-old undergraduate; George A. Akerlof, whose inspiration still guides me, even more than 25 years after he signed my dissertation; William J. McDonough, who gave me the opportunity to watch and ask questions from inside the Federal Reserve; Peter R. Fisher, who was my day-to-day guide to what I was seeing during my time at the Fed; and Jaime Caruana and Hervé Hannoun, whose patience and understanding helped me appreciate the global central bank community.

Of my numerous collaborators and colleagues over the years, Nelson Mark (now at the University of Notre Dame) is the most important. His encouragement, counsel, and friendship have guided me for more than 15 years. In addition, Michael Bryan of the Federal Reserve Bank of Atlanta has been a constant source of help and encouragement, as have numerous friends throughout the central banking world.

Among all of the professional colleagues who took the time to read early versions of the manuscript, I would like to single out Jim Fackler for his insight and patience. This book is much better for the time he generously devoted to correcting my logical mistakes and helping ensure that the exercises would reinforce the lessons in each chapter.

Without all the people at McGraw-Hill this book would never have been written. Gary Burke and Paul Shensa first convinced me that I could write this book, and then taught me how. Erin Strathmann worked tirelessly (and daily) to improve the book. Betty Morgan made my sentences and paragraphs readable. And all of the people in production and design turned the words and charts into a beautiful, readable book. Starting with the third edition, Gregg Forte has made notable contributions through his skilled editing of the manuscript. And, for the last two editions, Christina Kouvelis has done the hard work of ensuring everyone maintained the high standard.

Without students, universities would not exist. And without a class in money and banking to teach, I would not have written this book. I owe a debt to every student who has sat in a classroom with me. Several deserve special mention for the time and effort they put into helping with the manuscript: Margaret Mary McConnell of the Federal Reserve Bank of New York, Roisin O’Sullivan of Smith College, Stefan Krause formerly of the Banque de France, Lianfa Li of Peking University, Craig Evers of Brevan Howard, and Georgios Karras of the University of Illinois at Chicago.

And finally, there is my family; my wife Ruth and our sons Daniel and Ethan. For years they put up with my daily routine of writing, rewriting, and rewriting again and again. To them I owe the biggest thanks.

**Stephen G. Cecchetti**

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There is not enough space here to thank the many people who taught me about financial markets and institutions during my more than two decades of work as a market economist, but a few deserve special mention. Hugh Patrick was an inspiration in graduate school and remains a friend and guide. In the financial markets, I benefited especially from the wisdom of Henry Kaufman and the economists he gathered at Salomon Brothers in the 1980s—Richard Berner, Robert DiClemente, John Lipsky, and Nicholas Sargen. The members of the economics team that I was privileged to lead at Salomon (and later at Citi) continued my education, including (among many others) Lewis Alexander, Robert DiClemente, Don Hanna, Michael Saunders, Christopher Wiegand, and Jeffrey Young.

I also owe an extraordinary debt to my colleagues at the New York University Leonard N. Stern School of Business, who welcomed me, gave me the privilege of teaching excellent students, and entrusted me with the honor of directing Stern’s Center for Global Economy and Business ([www.stern.nyu.edu/cgeb](http://www.stern.nyu.edu/cgeb)). For their sustained support and guidance, I thank former Dean Thomas Cooley, current Dean Peter Henry, former Vice Dean Ingo Walter, and the distinguished current and former chairmen of the Department of Economics—the late David Backus, Luis Cabral, Paul Wachtel, Lawrence White, and Stanley Zin. David Backus, Kim Ruhl, and Michael Waugh gave me

the tools to teach MBA students. Jennifer Carpenter has been my partner as Associate Director of the Center for Global Economy and Business, while John Asker, Thomas Philippon, Kim Ruhl, Laura Veldkamp, Paul Wachtel, and Michael Waugh have all served as Center research group coordinators and my advisors. Jonathan Robidoux keeps the Center operating efficiently and with a smile each day. Many others deserve thanks for making Stern the thriving research and teaching environment that it is today, but I am especially grateful for the support of Viral Acharya, Gian Luca Clementi, Robert Engle, Mervyn King, Matthew Richardson, Bruce Tuckman, Stijn van Nieuwerburgh, and Robert Whitelaw. Finally, many thanks to Brian LeBlanc for his research assistance in the preparation of this fifth edition.

Of course, my greatest debt is to my wife, Elvira Pratsch. I also thank my parents, Harold and Evelyn, as well as my sister and brother, Sharon and Andy.

**Kermit L. Schoenholtz**

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Thank you to the following contributing reviewers for this and previous editions.

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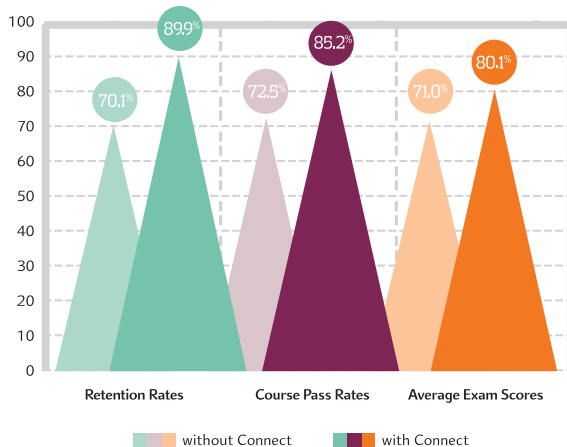
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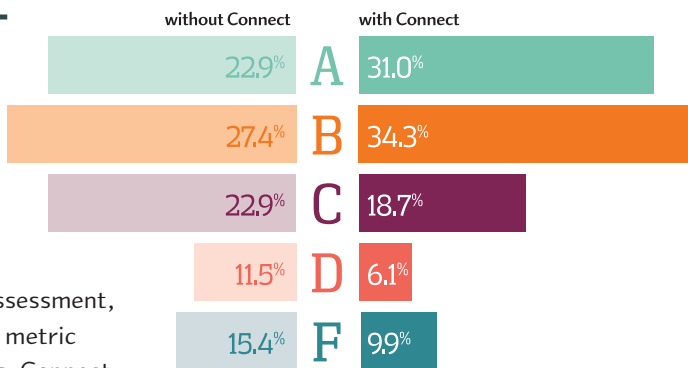
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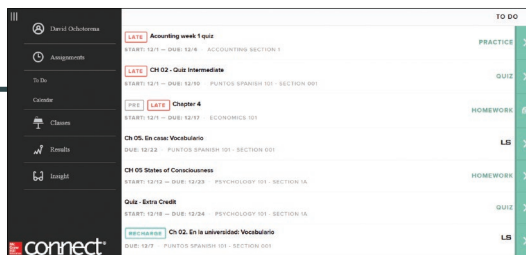
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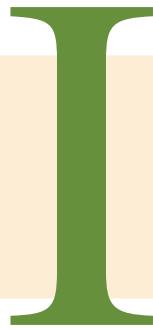
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Part



# Money and the Financial System

## Chapter 1

An Introduction to Money and the Financial System

## Chapter 2

Money and the Payments System

## Chapter 3

Financial Instruments, Financial Markets, and Financial Institutions

# Chapter 1

## An Introduction to Money and the Financial System

### Learning Objectives

*After reading this chapter, you should be able to:*

- LO1\*** List and explain the six parts of the financial system.
- LO2** Identify the five core principles of money and banking.
- LO3** Describe the special features and organization of the book.

This morning, a typical American college student bought coffee at the local café, paying for it with an ATM card. Then she jumped into her insured car and drove to the university, which she attends thanks to her student loan. She may have left her parents' home, which is mortgaged, a few minutes early to avoid construction work on a new dormitory, financed by bonds issued by the university. Or perhaps she needed to purchase this book online, using her credit card, before her first money and banking class began.

Beneath the surface, the financial transactions embedded in this story—even the seemingly simple ones—are quite complicated. If the café owner and the student use different banks, paying for the coffee will require an interbank funds transfer. The company that insures the student's car has to invest the premiums she pays until they are needed to pay off claims. The student's parents almost surely obtained their home mortgage through a mortgage broker, whose job was to find the cheapest mortgage available. And the bonds the university issued to finance construction of the new dormitory were created with the aid of an investment bank.

This brief example hints at the complex web of interdependent institutions and markets that is the foundation for our daily financial transactions. The system is so efficient that most of us rarely take note of it. But a financial system is like air to an economy: If it disappeared suddenly, everything would grind to a halt.

In the autumn of 2008, we came closer to such a financial meltdown than at any time since the 1930s. In the earlier episode, the collapse of the banking system led to the Great Depression. In the recent crisis, some of the world's largest financial institutions failed. Key markets stopped functioning. Credit dried up, even for sound borrowers. As a result, vibrant companies that relied on short-term loans to pay their employees and buy materials faced potential ruin. Even some fundamental ways that we make payments for goods and services were threatened.

\*LO Learning Objective

Gasping for air in this financial crisis, the global economy during 2008 and 2009 sank into the deepest, broadest, and longest downturn since the 1930s. Around the world, tens of millions of people lost their jobs. In the United States, millions lost their homes and their life's savings. Others became unable to borrow to buy a home or go to college. And the weakness added to financial fragility elsewhere, especially in Europe, where the viability of the euro, the world's leading currency after the U.S. dollar, was threatened. The chances are good that you know someone—in your neighborhood, your school, or your family—whose life was changed for the worse by the crisis.

So, what happens in the financial system—whether for good or for bad—matters greatly for all of us. To understand the system—both its strengths and its vulnerabilities—let's take a closer look.

## The Six Parts of the Financial System

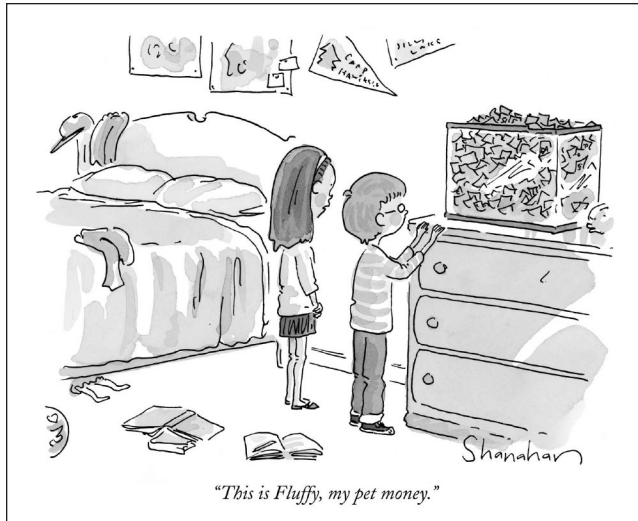
The **financial system**<sup>1</sup> has six parts, each of which plays a fundamental role in our economy. Those parts are money, financial instruments, financial markets, financial institutions, government regulatory agencies, and central banks.

We use the first part of the system, **money**, to pay for our purchases and to store our wealth. We use the second part, **financial instruments**, to transfer resources from savers to investors and to transfer risk to those who are best equipped to bear it. Stocks, mortgages, and insurance policies are examples of financial instruments. The third part of our financial system, **financial markets**, allows us to buy and sell financial instruments quickly and cheaply. The New York Stock Exchange is an example of a financial market. **Financial institutions**, the fourth part of the financial system, provide a myriad of services, including access to the financial markets and collection of information about prospective borrowers to ensure they are creditworthy. Banks, securities firms, and insurance companies are examples of financial institutions. Government **regulatory agencies** form the fifth part of the financial system. They are responsible for making sure that the elements of the financial system—including its instruments, markets, and institutions—operate in a safe and reliable manner. Finally, **central banks**, the sixth part of the system, monitor and stabilize the economy. The **Federal Reserve System** is the central bank of the United States.

While the essential functions that define these six categories endure, their form is constantly evolving. *Money* once consisted of gold and silver coins. These were eventually replaced by paper currency, which today is being eclipsed by electronic funds transfers. Methods of accessing means of payment have changed dramatically as well. As recently as 1970, people customarily obtained currency from bank tellers when they cashed their paychecks or withdrew their savings from the local bank. Today, they can get cash from practically any ATM anywhere in the world. To pay their bills, people once wrote checks and put them in the mail, and then waited for their monthly bank statements to make sure the transactions had been processed correctly. Today, payments can be made automatically, and account holders can check the transactions at any time on their bank's website or on their smartphone.

*Financial instruments* (or securities, as they are often called) have evolved just as much as currency. In the last few centuries, investors could buy individual stocks through stockbrokers, but the transactions were costly. Furthermore, putting together a portfolio of even a small number of stocks and bonds was extremely time

<sup>1</sup>Throughout the book, terms in bold red are “key terms” listed at the end of each chapter and defined in the glossary.



SOURCE: 1999 © Danny Shanahan/The New Yorker Collection/[www.cartoonbank.com](http://www.cartoonbank.com).

consuming; just collecting the information necessary to evaluate a potential investment was a daunting task. As a result, investing was an activity reserved for the wealthy. Today, financial institutions offer people with as little as \$1,000 to invest the ability to purchase shares in *mutual funds*, which pool the savings of a large number of investors. Because of their size, mutual funds can construct portfolios of hundreds or even thousands of different stocks and/or bonds.

The markets where stocks and bonds are sold have undergone a similar transformation. Originally, *financial markets* were located in coffeehouses and taverns where individuals met to exchange financial instruments. The next step was to create organized markets, like the New York Stock Exchange—trading places specifically dedicated to the buying and selling of stocks and bonds. Today, most of the activity that once

occurred at these big-city financial exchanges is handled by electronic networks. Buyers and sellers obtain price information and initiate transactions from their desktop computers or from handheld devices. Because electronic networks have reduced the cost of processing financial transactions, even small investors can afford to participate in them. Just as important, today's financial markets offer a much broader array of financial instruments than those available even 50 years ago.

*Financial institutions* have changed, as well. Banks began as vaults where people could store their valuables. Gradually, they developed into institutions that accepted deposits and made loans. For hundreds of years, in fact, that was what bankers did. Today, a bank is more like a financial supermarket. Walk in and you will discover a huge assortment of financial products and services for sale, from access to the financial markets to insurance policies, mortgages, consumer credit, and even investment advice.

The activities of government regulatory agencies and the design of **regulation** have been evolving and have entered a period of more rapid change, too. In the aftermath of the financial crisis of 1929–1933, when the failure of thousands of banks led to the Great Depression, the U.S. government introduced regulatory agencies to provide wide-ranging financial regulation—rules for the operation of financial institutions and markets—and **supervision**—oversight through examination and enforcement. The U.S. agencies established in the 1930s to issue and enforce these financial rules still operate.

Yet, the evolution of financial instruments, institutions, and markets has led to many changes in the ways that regulatory agencies work. A bank examiner used to count the money in the cash drawers and call borrowers to see if the loans on a bank's books were real. The examiner might even visit workplaces to see if the loans were used as designed to buy equipment or build a factory. Today, banks engage in millions of transactions, many of which are far more complex and difficult to understand than a loan or a mortgage. So, a government examiner also looks at the systems that a bank uses to manage its various risks. In doing so, regulators try to encourage best practices throughout the financial industry.

However, the failure of regulators in the United States and elsewhere around the world to anticipate or prevent the financial crisis of 2007–2009 has led many governments to undertake far-reaching changes to financial regulation and the regulatory



agencies. The Dodd-Frank Wall Street Reform and Consumer Protection Act, adopted in 2010 and known as the **Dodd-Frank Act**, is the largest U.S. regulatory change since the 1930s. Also in 2010, regulators of many nations agreed on a third, major update of standards for internationally active banks—known as **Basel III** after the Swiss city where the policymakers meet. Both reforms will take years to implement, and their influence will shape the financial system for decades.

Finally, *central banks* have changed a great deal. They began as large private banks founded by monarchs to finance wars. For instance, King William of Orange created the Bank of England in 1694 for the express purpose of raising taxes and borrowing to finance a war between Austria, England, and the Netherlands on one side and Louis XIV's France on the other. Eventually, these government treasuries grew into the modern central banks we know today. While only a few central banks existed in 1900, now nearly every country in the world has one, and they have become one of the most important institutions in government. Central banks control the availability of money and credit to promote low inflation, high growth, and the stability of the financial system. Because their current mission is to serve the public at large rather than land-hungry monarchs, their operating methods have changed as well. A central bank's decisions used to be shrouded in mystery, but today's policymakers strive for transparency in their operations. Officials at the **European Central Bank** and the U.S. Federal Reserve—two of the most important central banks in the world—go out of their way to explain the rationale for their decisions.

Though the changing nature of our financial system is a fascinating topic, it poses challenges for both students and instructors. How can we teach and learn about money and banking in a way that will stand the test of time, so that the knowledge we gain won't become outmoded? The answer is that we must develop a way to understand and adapt to the evolutionary structure of the financial system. That means discussing money and banking within a framework of core principles that do not change over time. The next section introduces the five core principles that will guide our studies throughout this book.

## The Five Core Principles of Money and Banking

Five core principles will inform our analysis of the financial system and its interaction with the real economy. Once you have grasped these principles, you will have a better understanding not only of what is happening in the financial world today but of changes that will undoubtedly occur in the future. The five principles are based on **Time, Risk, Information, Markets, and Stability**.

### Core Principle 1: Time Has Value

The first principle of money and banking is that *time has value*. At some very basic level, everyone knows this. If you take a job at the local supermarket, you will almost surely be paid by the hour. An hour's worth of work equals a certain number of dollars. Literally, your time has a price.

On a more sophisticated level, **time** affects the value of financial transactions. Most loan contracts allow the borrower to spread out the payments over time. If you take out an auto loan, for example, the lender will allow you to make a series of monthly payments over three, four, or even five years. If you add up the payments, you'll discover that the total exceeds the amount of the loan. At an interest rate of 4 percent,



a four-year, \$10,000 car loan will require 48 monthly payments of \$226 each. That means you will repay a total of \$10,848 (48 times \$226). The reason your repayments total more than the loan amount is that you are paying interest to compensate the lender for the time during which you use the funds. That is, the resources you borrowed have an opportunity cost to the lender so you have to pay rent on them.

Interest payments are fundamental to a market economy. In Chapter 4, we will develop an understanding of interest rates and how to use them. Then, throughout the remainder of Part II, we will apply the principle that time has value in our discussion of the valuation of bonds, stocks, and other financial instruments involving future payments. How much should you be willing to pay for a particular stock or bond? Figuring out what alternative investments are worth, and comparing them, means valuing payments made on different future dates. The same principle applies to the question of how much you must invest today to achieve a particular financial objective in the future. How much of your salary, for example, do you need to save each month to meet your goal of buying a house? The length of time your savings will be earning interest is a key to answering this question.



## Core Principle 2: Risk Requires Compensation

The world is filled with uncertainty. More events, both good and bad, *can* happen than *will* happen. Some of the possibilities, such as the likelihood of your home doubling in value after you buy it, are welcome. Other possibilities, such as the chance that you might lose your job and not be able to make your car payments, are distinctly unwelcome. Dealing effectively with **risk** requires that you consider the full range of possibilities in order to eliminate some risks, reduce others, pay someone to assume particularly onerous risks, and just live with what's left. Needless to say, no one will assume your risks for free, which brings us to the second core principle of money and banking: *Risk requires compensation*. In the financial world, compensation is made in the form of explicit payments. That is, investors must be paid to assume risk; the higher the risk, the bigger the required payment.

Car insurance is a common example of paying someone else to shoulder a risk you don't want to take. If your car is wrecked in an accident, you will want to be able to repair it. But beyond that, auto insurance shelters drivers from the possibility of losing all their wealth in the event that they cause an accident in which someone is seriously injured. Although the chances of causing such an accident are quite small, the results can be so serious that, even if the government didn't require it, most of us would voluntarily purchase auto insurance. Driving without it just isn't worth the risk. The insurance company pools the premiums that policyholders pay and invests them. Even though some of the premiums will be spent to settle claims when cars are stolen or damaged by collisions, the chance to make a profit is good. So both the insurance company and the drivers who buy policies are ultimately better off.

Bearing in mind that time has value and risk requires compensation, we can begin to see the rationale behind the valuation of a broad set of financial instruments. For example, a lender will charge a higher interest rate on a loan if there is a chance that the borrower will not repay. In Chapters 6 and 7, we will use this principle when we examine the interest rates on bonds. As we will see, a company or a government that is on the verge of being unable to pay its bills may still be able to issue bonds (called *junk bonds*), but it will have to pay an extremely high interest rate to do so. The reason is that the lender must be compensated for the substantial risk that the company will not repay the loan. Risk requires compensation.

### Core Principle 3: Information Is the Basis for Decisions

Most of us collect **information** before making decisions. The more important the decision, the more information we gather. Think of the difference between buying a \$5 sandwich and a \$10,000 used car. You will surely spend more time comparing cars than comparing sandwiches.

What's true for sandwiches and cars is true for finance as well. That is, *information is the basis for decisions*. In fact, the collection and processing of information is the foundation of the financial system. In Chapter 11, we will learn how financial institutions like banks funnel resources from savers to investors. Before a bank makes a loan, a loan officer will investigate the financial condition of the individual or firm seeking it. Banks want to provide loans only to the highest-quality borrowers. Thus, they spend a great deal of time gathering the information needed to evaluate the creditworthiness of loan applicants.

To understand the problem faced by the two parties to any financial transaction, think about a home mortgage. Before making the loan, the mortgage broker examines the applicant's finances and researches the home's value to make sure the applicant can afford the monthly payments and the property is more valuable than the loan.

And before the broker transfers the funds to the seller, the new homeowner must purchase fire insurance. All these requirements arise from the fact that the lender doesn't know much about the borrower and wants to make sure the loan will be repaid. When lenders fail to assess creditworthiness properly, they end up with more borrowers who are unable to repay their loans in the future. Large mistakes like these were a key factor in the wave of U.S. mortgage delinquencies and defaults that preceded the financial crisis of 2007–2009. Even as recently as 2016, mortgages on four million U.S. homes still exceeded the underlying property value.

Information plays a key role in other parts of the financial system as well. In Chapters 2 and 3, we'll see that many types of transactions are arranged so that the buyer doesn't need to know anything about the seller. When merchants accept cash, they don't need to worry about the customer's identity. When stocks change hands, the buyer doesn't need to know anything about the seller, or vice versa. Stock exchanges are organized to eliminate the need for costly information gathering, facilitating the exchange of securities. In one way or another, information is the key to the financial system.

### Core Principle 4: Markets Determine Prices and Allocate Resources

**Markets** are the core of the economic system. They are the place, physical or virtual, where buyers and sellers meet, where firms go to issue stocks and bonds, and where individuals go to trade assets. Financial markets are essential to the economy, channeling its resources and minimizing the cost of gathering information and making transactions. In fact, well-developed financial markets are a necessary precondition for healthy economic growth. For the most part, the better developed a country's financial markets, the faster the country will grow.

The reason for this connection between markets and growth is that *markets determine prices and allocate resources*. Financial markets gather information from a large number of individual participants and aggregate it into a set of prices that signals what is valuable and what is not. Thus, markets are sources of information. By attaching prices to different stocks or bonds, they provide a basis for the allocation of capital.



To see how prices in the financial markets allocate capital, think about a large firm wishing to finance the construction of a new factory costing several hundred million dollars. To raise the funds, the firm can go directly into the financial markets and issue stocks or bonds. The higher the price investors are willing to pay in the market, the more appealing the idea will be, and the more likely it is that the firm will issue securities to raise the capital for the investment.

We will refer to the financial markets throughout much of this book. While our primary focus in Part II will be the nature of financial instruments, we will also study the markets in which those instruments are traded. Chapters 6 through 10 describe the markets for bonds, stocks, derivatives, and foreign currencies.

Importantly, financial markets do not arise by themselves—at least, not the large, well-oiled ones we see operating today. Markets like the New York Stock Exchange, where billions of shares of stock change hands every day, require rules in order to work properly, as well as authorities to police them. Otherwise, they will not function. For people to be willing to participate in a market, they must perceive it as fair. As we will see, this creates an important role for the government. Regulators and supervisors of the financial system make and enforce the rules, punishing people who violate them. When the government protects investors, financial markets work well and help promote economic growth; otherwise they don't.

Finally, even well-developed markets can break down. When they do—as some did during the financial crisis of 2007–2009—the financial system as a whole can be at risk. So today, governments must also play a role in promoting the healthy operation of markets.



## Core Principle 5: Stability Improves Welfare

Most of us prefer stable to variable incomes. We like getting raises, but the prospect of a salary cut is not a pleasant one. This brings us to the fifth core principle of money and banking: *Stability improves welfare*. **Stability** is a desirable quality, not just in our personal lives but in the financial system as a whole. As we saw at the start of this chapter, financial instability in the autumn of 2008 brought us closer to a collapse of the system than at any time since the 1930s, triggering the worst global downturn since the Great Depression. And the banking and government debt crisis in the euro area partly reversed Europe's financial integration, a cornerstone of its successful economic and political framework in recent decades.

If you are wondering whether this principle is related to Core Principle 2 (risk requires compensation), you are right. Because volatility creates risk, reducing volatility reduces risk. But while individuals can eliminate many risks on their own (we'll see how when we study financial instruments in Part II), some risks can only be reduced by government policymakers. Business cycle fluctuations are an example of the sort of instability individuals can't eliminate on their own. And though "automatic stabilizers" like unemployment insurance and the income tax system reduce the burden of recessions on individuals, they cannot eliminate an economic slowdown. Monetary policymakers can moderate these downswings by carefully adjusting interest rates. Central banks also have powerful tools to steady fragile financial systems and to repair or support dysfunctional markets. In stabilizing the economy as a whole, they eliminate risks that individuals can't, improving everyone's welfare in the process.

As we will learn in Part IV of this book, stabilizing the economy is a primary function of central banks like the Federal Reserve and the European Central Bank. Officials of these institutions are charged with controlling inflation and reducing business cycle fluctuations. That is, they work to keep inflation low and stable and to keep growth

high and stable. They also have key roles in securing financial stability. When they are successful, they reduce both the risk that individuals will lose their jobs and the uncertainty that firms face in making investment decisions. Not surprisingly, a stable economy grows faster than an unstable economy. Stability improves welfare.



Throughout the book you will notice icons like this in the margin in various places. These will guide you to the core principle that provides the foundation for what is being discussed at that point in the text.

## Special Features of This Book

The very first special feature of every chapter in this book is its introduction—each one presents a real-world example that leads to the big questions the chapter is designed to answer, such as: What is money? What do banks do? How does the bond market work? What does the Federal Reserve do to prevent or limit financial crises?

After that real-world setup, the text of each chapter presents the economic and financial theory you need to understand the topics covered. Learning objectives listed at the beginning of the chapter outline the core concepts that are discussed and should be mastered. Each chapter also contains a series of inserts that apply the theory. There are five types of inserts: Your Financial World, Applying the Concept, Lessons from the Crisis, In the Blog, and Tools of the Trade. Finally, the end of each chapter is divided into four sections: Key Terms, Using FRED, Chapter Lessons, and Problems. Here are some guidelines for using the inserts and end-of-chapter materials.

### Your Financial World

When most people decide to make a major purchase, they begin by collecting information. If they are considering buying a car, they will first try to decide which model is best for them and then work hard to pay the lowest price possible. Even for smaller purchases, like clothes or groceries, people first gather information and then buy.

Financial transactions should be no different from consumer purchases. Become informed first, and then buy. If you're thinking, "That's easier said than done," you're right. The problem is that most people have very little knowledge of the financial system, so they don't know how to start or what kind of information to collect.

That's where Your Financial World comes in. These inserts provide basic guidelines for applying economic theory to the bread-and-butter financial decisions you make nearly every day. Your Financial World answers questions about:

- Banking and Payments
  - What's the difference between credit and debit cards?
  - How should you pick a bank?
- Investments
  - Should you own stocks or bonds or gold?
  - Should you invest in the company you work for?
- Credit, Loans, and Mortgages
  - What do you need to know about your mortgage?
  - What is your credit score and why is it important?
- Insurance
  - How much life insurance do you need?
  - How much car insurance do you need?