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HUBBARD O'BRIEN

Money, Banking, and the Financial System

THIRD EDITION

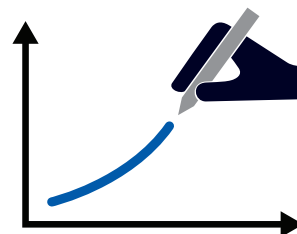


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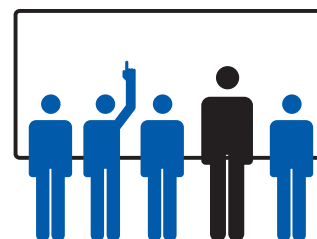
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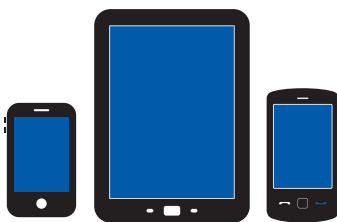
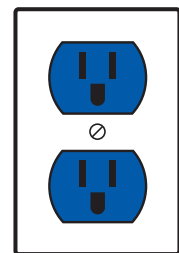
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MONEY, BANKING, AND THE FINANCIAL SYSTEM

THIRD EDITION

R. Glenn Hubbard

Columbia University

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New York, NY

Dedication

For Constance, Raph, and Will

—R. Glenn Hubbard

For Cindy, Matthew, Andrew, and Daniel

—Anthony Patrick O'Brien

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Preface

Do You Think This Might Be Important?

It's customary for authors to begin textbooks by trying to convince readers that their subject is important—even exciting. Following the events of recent years, with dramatic swings in stock prices, negative interest rates, unprecedented monetary policy actions, and a slow recovery from the devastating financial crisis of 2007–2009, we doubt anyone needs to be convinced that the study of money, banking, and financial markets is important. And it's exciting ... sometimes maybe a little too exciting. The past 10 years has seen dramatic changes to virtually every aspect of how money is borrowed and lent, how banks and other financial firms operate, and how policymakers regulate the financial system. As a colleague of ours remarked: "I believe if I gave students the same exam I gave 10 years ago, I would require different answers to most of the questions!" Our goal in this textbook is to provide instructors and students with tools to understand these changes in the financial system and in the conduct of monetary policy.

New to This Edition

We were gratified by the enthusiastic response of students and instructors who used the previous two editions of this book. The response confirmed our view that a modern approach, paying close attention to recent developments in policy and theory, would find a receptive audience. In this third edition, we retain the key features of our previous editions while making several changes to address feedback from instructors and students and also to reflect our own classroom experiences. Here is a summary of our key changes, which are discussed in detail in the pages that follow:

- Added new coverage of how interest rates are determined using the money market model in Section 4.4, "Interest Rates and the Money Market Model." The section on the loanable funds model, which appeared in the body of the text in the previous edition, has been moved to a new appendix.
- Expanded the discussion of stock market indexes in Section 6.1, "Stocks and the Stock Market."
- Changed the organization of topics in Chapter 8, "The Market for Foreign Exchange," by moving the section on hedging exchange rate risk to the last section of the chapter where it can be easily omitted by instructors who do not cover this material.
- Added new coverage of why economists believe economic performance depends on the financial system in Section 9.1, "The Financial System and Economic Performance."
- Added new coverage of the effect of the Wall Street Reform and Consumer Protection Act (Dodd-Frank) on the Federal Reserve's ability to act as a lender of last resort in Section 12.4, "Financial Crises and Financial Regulations."
- Added new coverage of how the huge increase in bank reserves has affected the determination of the federal funds rate in Section 15.2, "Monetary Policy Tools and the Federal Funds Rate."
- Added new coverage of how the Fed manages the federal funds rate now that reserves are no longer scarce in Section 15.3, "The Fed's Monetary Policy Tools and Its New Approach to Managing the Federal Funds Rate."
- Revised coverage of China's interventions in the exchange rate market in Section 16.4, "Exchange Rate Regimes and the International Financial System," and added coverage of the policy trilemma.

- Added new coverage of the shadow bank lending channel in Section 18.4, “Are Interest Rates All That Matter for Monetary Policy?”
- Replaced 11 chapter-opening cases and updated retained cases.
- Added 18 new *Making the Connection* features, including several that are relevant to students’ personal lives and decisions.
- Added 2 new *Solved Problem* features and updated retained *Solved Problems*. Some *Solved Problems* also involve subjects that are relevant to students’ personal lives and financial decisions.
- Added 23 new figures and 5 new tables and updated the remaining graphs and tables with the latest available data.
- Replaced or updated approximately one-half of the *Review Questions* and the *Problems and Applications*, which students can complete on MyEconLab.
- Retained 46 real-time data exercises that students can complete on MyEconLab, where students and instructors can view the very *latest data* from FRED, the online macroeconomic data bank of the Federal Reserve Bank of St. Louis.

New Key Coverage

- Chapter 4, “Determining Interest Rates,” includes new coverage of the determination of the short-run nominal interest rate using the money market model (also called the liquidity preference model) in Section 4.4, “Interest Rates and the Money Market Model.” Including this new section in an early chapter allows professors to cover the relationship between changes in the money supply and short-term interest rates as part of the initial discussion of how interest rates are determined. We moved the section “The Loanable Funds Model and the International Capital Market,” which appeared in the body of Chapter 4 in previous editions, to an appendix. This change is based on market feedback indicating that some instructors want the option to delay or skip covering the open-economy framework.
- Chapter 6, “The Stock Market, Information, and Financial Market Efficiency,” has expanded coverage of stock market indexes to carefully illustrate why economists, policymakers, and investors use averages of stock prices, rather than the prices of any one company, to evaluate the state of the stock market.
- Changed the organization of topics in Chapter 8, “The Market for Foreign Exchange.” The material in Section 8.2, “Foreign-Exchange Markets,” of the previous edition that covered the use of derivatives in foreign-exchange markets has been moved to the end of the chapter, Section 8.3, “A Demand and Supply Model of Short-Run Movements in Exchange Rates,” where it can be easily omitted by instructors who do not wish to cover this material. The remainder of the material from the previous edition’s Section 8.2 has been integrated into Section 8.1. The relationship between the demand and supply approach to analyzing exchange rates and the interest-rate parity approach in the final section has been rewritten and clarified.
- Chapter 9, “Transactions Costs, Asymmetric Information, and the Structure of the Financial System,” now covers why economists believe economic performance depends on the financial system in a new Section 9.1, “The Financial System and Economic Performance.” This topic remains central in the aftermath of the 2007–2009 financial crisis, and the discussion helps reinforce the importance of many of the topics discussed in this and other chapters.
- Chapter 12, “Financial Crises and Financial Regulation,” now includes a discussion of whether the Wall Street Reform and Consumer Protection Act (Dodd-Frank) has narrowed the Federal Reserve’s ability to act as a lender of last resort in the event of

another financial crisis (see the *Making the Connection* “Will Dodd-Frank Tie the Fed’s Hands in the Next Financial Crisis?” in Section 12.4, “Financial Crises and Financial Regulations”).

- The most important changes to this edition are in Chapter 15, “Monetary Policy.” In previous editions, we followed the conventional approach of showing the equilibrium federal funds rate as being determined by the demand and supply for reserves. This approach assumes that reserves are scarce, which was an accurate assumption until the financial crisis of 2007–2009. But with banks currently holding \$2 trillion in reserves, the traditional approach to explaining changes in the federal funds rate is no longer accurate. We explain the consequences of dropping the traditional assumption of scarce reserves in Section 15.2, “Monetary Policy Tools and the Federal Funds Rate.” Then, in Section 15.3, “The Fed’s Monetary Policy Tools and Its New Approach to Managing the Federal Funds Rate,” we provide a new discussion of how the Federal Reserve currently manages the federal funds rate. This new discussion focuses on how the Fed uses the interest rate it pays on reserve balances (IOER) and the interest rate it pays on overnight reverse repurchase agreements (the ON RPP rate) to change its target for the federal funds rate. The discussion is summarized in new Figure 15.8, “The Fed’s New Procedures for Managing the Federal Funds Rate.” We believe that our new approach is essential if students are to understand this crucial aspect of Fed policymaking.
- Chapter 16, “The International Financial System and Monetary Policy,” includes updated and revised coverage of China’s interventions in the exchange-rate market in Section 16.4, “Exchange Rate Regimes and the International Financial System.” This coverage is not only more current but points to the heightened risks facing China’s economy and financial system. Section 16.4 also includes new coverage and a figure on the policy trilemma, which is the hypothesis that it is impossible for a country to have exchange rate stability, monetary policy independence, and free capital flows at the same time.
- Chapter 18, “Monetary Theory II: The IS–MP Model,” includes new coverage of the shadow bank lending channel in Section 18.4, “Are Interest Rates All That Matter for Monetary Policy?” The role of shadow banking in the 2007–2009 financial crisis—and in the current financial system—makes this topic important for analyzing monetary policy.

New Chapter-Opening Cases

Each chapter-opening case provides a real-world context for learning, sparks students’ interest in money and banking, and helps to unify the chapter. The third edition includes the following new chapter-opening cases:

- “You Get a Bright Idea ... but Then What?” (Chapter 1, “Introducing Money and the Financial System”)
- “The Federal Reserve: Good for Main Street or Wall Street—or Both?” (Chapter 2, “Money and the Payments System”)
- “Why Are Interest Rates So Low?” (Chapter 4, “Determining Interest Rates”)
- “The Long and the Short of Interest Rates” (Chapter 5, “The Risk Structure and Term Structure of Interest Rates”)
- “You, Too, Can Buy and Sell Crude Oil ... But Should You?” (Chapter 7, “Derivatives and Derivative Markets”)
- “Who Is Mario Draghi, and Why Should Proctor & Gamble Care?” (Chapter 8, “The Market for Foreign Exchange”)
- “Small Businesses Flock to the Bank of Bird-in-Hand” (Chapter 10, “The Economics of Banking”)
- “Wells Fargo Owns Part of the Fed. Does It Matter?” (Chapter 13, “The Federal Reserve and Central Banking”)

- “The End of ‘Normal’ Monetary Policy?” (Chapter 15, “Monetary Policy”)
- “Why Did Employment Grow Slowly After the Great Recession?” (Chapter 17, “Monetary Theory I: The Aggregate Demand and Aggregate Supply Model”)
- “Forecasting the Federal Funds Rate Is Difficult ... Even for the Fed!” (Chapter 18, “Monetary Theory II: The IS–MP Model”)


New *Making the Connection* Features and Supporting End-of-Chapter Exercises

Each chapter includes two or more *Making the Connection* features that provide real-world reinforcement of key concepts. Several of these *Making the Connections* cover topics that apply directly to the personal lives and decisions that students make and include the subtitle *In Your Interest*. The following are the new *Making the Connections*:

- “The Rise of Peer-to-Peer Lending and Fintech” (Chapter 1, “Introducing Money and the Financial System”)
- “Will Sweden Become the First Cashless Society?” (Chapter 2, “Money and the Payments System”)
- “*In Your Interest*: Does Your Portfolio Have Enough Risk?” (Chapter 4, “Determining Interest Rates”)
- “*In Your Interest*: If Stock Prices Can’t Be Predicted, Why Invest in the Market?” (Chapter 6, “The Stock Market, Information, and Financial Market Efficiency”)
- “Brexit, Exchange Rates, and the Profitability of British Firms” (Chapter 8, “The Market for Foreign Exchange”)
- “*In Your Interest*: FICO: Can One Number Forecast Your Financial Life—and Your Romantic Life?” (Chapter 10, “The Economics of Banking”)
- “*In Your Interest*: Starting a Small Business? See Your Community Banker” (Chapter 10, “The Economics of Banking”)
- “Will Dodd-Frank Tie the Fed’s Hands in the Next Financial Crisis?” (Chapter 12, “Financial Crises and Financial Regulation”)
- “Should Bankers Have a Role in Running the Fed?” (Chapter 13, “The Federal Reserve and Central Banking”)
- “Are Negative Interest Rates an Effective Monetary Policy Tool?” (Chapter 15, “Monetary Policy”)
- “The ‘Exorbitant Privilege’ of the U.S. Dollar?” (Chapter 16, “The International Financial System and Monetary Policy”)
- “Free Fannie and Freddie?” (Chapter 18, “Monetary Theory II: The IS–MP Model”)

46 Retained Real-Time Data Exercises That Students Can Complete on MyEconLab Using the Latest FRED Data

MyEconLab is a powerful assessment and tutorial system that works hand-in-hand with *Money, Banking, and the Financial System*. MyEconLab includes comprehensive homework, quiz, test, and tutorial options, allowing instructors to manage all assessment needs in one program. Key innovations in the MyEconLab course for *Money, Banking, and the Financial System*, third edition, include the following:

- Real-time *Data Analysis Exercises*, marked with , allow students and instructors to use the very latest data from FRED, the online macroeconomic data bank from the Federal Reserve Bank of St. Louis. By completing the exercises, students become familiar with a key data source, learn how to locate data, and develop skills to interpret data.

- In the Multimedia Library available in MyEconLab, select figures labeled **MyEconLab Real-time data** allow students to display a popup graph updated with real-time data from FRED.
- Current News Exercises provide a turn-key way to assign gradable news-based exercises in MyEconLab. Every week, Pearson locates a current news article, creates an exercise around the article, and adds it to MyEconLab.

Other Changes

- New *Solved Problems* have been added. Many students have difficulty handling problems in applied economics. We help students overcome this hurdle by including worked-out problems in each chapter. The following *Solved Problems* are new to this edition:
 - “Political Uncertainty and Bond Yields” (Chapter 5, “The Risk Structure and Term Structure of Interest Rates”)
 - “The Bank of Japan Counters the Rising Yen” (Chapter 16, “The International Financial System and Monetary Policy”)
- Approximately one-half of the *Review Questions* and *Problems and Applications* at the end of each chapter have been replaced or updated.
- Graphs and tables have been updated with the latest available data.

Our Approach

In this book, we provide extensive analysis of the financial events of recent years. We believe these events are sufficiently important to be incorporated into the body of the text rather than just added as boxed features. In particular, we stress a lesson policymakers learned the hard way: What happens in the shadow banking system is as important to the economy as what happens in the commercial banking system.

We realize, however, that the details of the financial crisis and recession will eventually pass into history. In this text, we don’t want to just add to the laundry list of facts that students must memorize. Instead, we lead students through the economic analysis of why the financial system is organized as it is and how the financial system is connected to the broader economy. We are gratified by the success of our principles of economics textbook, and we have employed a similar approach in this textbook: We provide students with a framework that allows them to apply the theory that they learn in the classroom to the practice of the real world. By learning this framework, students will have the tools to understand developments in the financial system during the years to come. To achieve this goal, we have built four advantages into this text:

1. A framework for understanding, evaluating, and predicting
2. A modern approach
3. Integration of international topics
4. A focus on the Federal Reserve

Framework of the Text: Understand, Evaluate, Predict

The framework underlying all discussions in this text has three levels:

- First, students learn to *understand* economic analysis. “Understanding” refers to students developing the economic intuition they need to organize concepts and facts.
- Second, students learn to *evaluate* current developments and the financial news. Here, we challenge students to use financial data and economic analysis to think critically about how to interpret current events.

- Finally, students learn to use economic analysis to *predict* likely changes in the economy and the financial system.

Having just come through a period in which Federal Reserve officials, members of Congress, heads of Wall Street firms, and nearly everyone else failed to predict a huge financial crisis, the idea that we can prepare students to predict the future of the financial system may seem overly ambitious—to say the least. We admit, of course, that some important events are difficult to anticipate. But knowledge of the economic analysis we present in this book does make it possible to predict many aspects of how the financial system will evolve. For example, in Chapter 12, “Financial Crises and Financial Regulation,” we discuss the ongoing cycle of financial crisis, regulatory response (such as the 2010 Wall Street Reform and Consumer Protection Act [Dodd-Frank]), financial innovation, and further regulatory response. We also cover the continuing debate over whether the Fed has retained sufficient authority as a lender of last resort to stabilize the financial system in the event of another crisis. With our approach, students learn not just the new regulations contained in Dodd-Frank but, more importantly, the key lesson that over time innovations by financial firms are likely to supersede many of the provisions of Dodd-Frank. In other words, students will learn that the financial system is not static but evolves in ways that can be understood using economic analysis.

A Modern Approach

Textbooks are funny things. Most contain a mixture of the current and the modern alongside the traditional. Material that is helpful to students is often presented along with material that is not so helpful or that is—frankly—counterproductive. We believe the ideal is to produce a textbook that is modern and incorporates the best of recent research on monetary policy and the financial system without chasing every fad in economics or finance. In writing this book, we have looked at the topics in the money and banking course with fresh eyes. We have pruned discussion of material that is less relevant to the modern financial system or no longer considered by most economists to be theoretically sound. We have also tried to be as direct as possible in informing students of what is and is not important in the financial system and policymaking as they exist today.

For example, rather than include the traditional long discussion of the role of reserve requirements as a monetary policy tool, we provide a brief overview and note that the Federal Reserve has not changed reserve requirements since 1992. Perhaps the most important distinction between our text and other texts is that we provide a complete discussion of how the Fed changes its target for the federal funds rate at a time when reserves are no longer scarce. The Fed’s new procedures are at the center of monetary policy, and students need an accurate and up-to-date discussion.

Similarly, it has been several decades since the Fed paid serious attention to targets for M1 and M2. Therefore, in Chapter 18, “Monetary Theory II: The IS–MP Model,” we replace the IS–LM model—which assumes that the central bank targets the money stock rather than an interest rate—with the IS–MP model, first suggested by David Romer more than 15 years ago. We believe that our modern approach helps students make the connection between the text material and the economic and financial world they read about. (For those instructors who wish to cover the IS–LM model, we provide an appendix on that model at the end of Chapter 18.)

By cutting out-of-date material, we have achieved two important goals: (1) We provide a much briefer and more readable text, and (2) we have made room for discussion of essential topics, such as the shadow banking system of investment banks, hedge funds, and mutual funds, as well as the origins and consequences of financial crises. See Chapter 11, “Beyond Commercial Banks: Shadow Banks and Nonbank Financial Institutions,” and Chapter 12, “Financial Crises and Financial Regulation.” Other texts either omit these topics or cover them only briefly.

We have taught money and banking to undergraduate and graduate students for many years. We believe that the modern, real-world approach in our text will engage students in ways that no other text can.

Integration of International Topics

When the crisis in subprime mortgages began, Federal Reserve Chairman Ben Bernanke famously observed that it was unlikely to cause much damage to the U.S. housing market, much less the wider economy. As it turned out, of course, the subprime crisis devastated not only the U.S. housing market but the U.S. financial system, the U.S. economy, and the economies of most of the developed world. That a problem in one part of one sector of one economy could cause a worldwide crisis is an indication that a textbook on money and banking must take seriously the linkages between the U.S. and other economies. We devote two full chapters to international topics: Chapter 8, “The Market for Foreign Exchange,” and Chapter 16, “The International Financial System and Monetary Policy.” In these chapters, we discuss such issues as the European sovereign debt crisis, the use of a negative interest rate policy by the European Central Bank, the Bank of Japan, and some other foreign central banks, and the increased coordination of monetary policy actions among central banks. We realize, however, that, particularly in this course, what is essential to one instructor is optional to another. So, we have written the text in a way that allows instructors to skip one or both of the international chapters.

A Focus on the Federal Reserve

We can hardly claim to be unusual in focusing on the Federal Reserve in a money and banking textbook ... but we do! Of course, all money and banking texts discuss the Fed, but generally not until near the end of the book—and the semester. After speaking to instructors in focus groups and based on our own years of teaching, we believe that approach is a serious mistake. In our experience, students often have trouble integrating the material in the money and banking course. To them, the course can seem a jumble of unrelated topics. The role of the Fed can serve as a unifying theme for the course. Accordingly, we provide an introduction and overview of the Fed in Chapter 1, “Introducing Money and the Financial System,” and in each subsequent chapter, we expand on the Fed’s role in the financial system. So, by the time students read Chapter 13, “The Federal Reserve and Central Banking,” where we discuss the details of the Fed’s operation, students already have a good idea of the Fed’s importance and its role in the system.

Special Features

We can summarize our objective in writing this textbook as follows: to produce a streamlined, modern discussion of the economics of the financial system and of the links between the financial system and the economy. To implement this objective, we have developed a number of special features. Some are similar to the features that have proven popular and effective aids to learning in our principles of economics textbook, while others were developed specifically for this book.

Key Issue and Question Approach

We believe that having a key issue and related key question in each chapter provides us with an opportunity to explain how the financial system works in the context of topics students read about online and in newspapers and discuss among themselves and with their families. In Chapter 1, “Introducing Money and the Financial System,” we cover the key components

KEY ISSUE AND QUESTION

Issue: Some economists and policymakers believe that bond rating agencies have a conflict of interest because they are paid by the firms whose bonds they are rating.

Question: Should the government more closely regulate the credit rating agencies?

Answered on page 167

of the financial system, introduce the Federal Reserve, and preview the important issues facing the financial system. At the end of Chapter 1, we present 17 key issues and questions that provide students with a roadmap for the rest of the book and help them to understand that learning the principles of money, banking, and the financial system will allow them to analyze the most important issues about the financial system and monetary policy. The goal here is not to make students memorize a catalog of facts. Instead, we use these key issues and questions to demonstrate that an economic analysis of the financial system is essential to understanding recent events. See pages 19–21 in Chapter 1 for a complete list of the issues and questions.

We start each subsequent chapter with a key issue and key question and end each of those chapters by using the concepts introduced in the chapter to answer the question.

Contemporary Opening Cases

Each chapter-opening case provides a real-world context for learning, sparks students' interest in money and banking, and helps to unify the chapter. For example, Chapter 11, "Beyond Commercial Banks: Shadow Banks and Nonbank Financial Institutions," opens with a discussion of the rise of the shadow banking system in a case study entitled "When Is a Bank Not a Bank? When It's a Shadow Bank!" We revisit this topic throughout the chapter.

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new role of nonbank financial firms. A year later, the term became well known after Timothy Geithner used it in a speech to the Economic Club of New York. Geithner was then the president of the Federal Reserve Bank of New York and later became secretary of the Treasury in the Obama administration. He cited a Federal Reserve study indicating that by 2008, the shadow banking system had grown to be more than 50% larger than the commercial banking system.

As the financial crisis worsened, two large investment banks—Bear Stearns and Lehman Brothers—and an insurance company—American International Group (AIG)—were at the center of the storm. Although many commercial banks were also drawn into the crisis, 2007–2009 represented the first time in U.S. history that a major financial crisis had originated outside of the commercial banking system. Problems with nonbanks made dealing with the crisis more difficult because U.S. policymaking and regulatory structures were based on the assumption that commercial banks were the most important financial firms. In particular, the Federal Reserve System had been established in 1914 to regulate the commercial banking system and to

use discount loans to help banks suffering from short-run liquidity problems. Similarly, the Federal Deposit Insurance Corporation (FDIC) had been established in 1934 to insure deposits in commercial banks. As we will see in this chapter, the FDIC does not insure short-term borrowing by shadow banks, and shadow banks are normally not eligible to receive loans from the Fed when they suffer liquidity problems. As a result, the shadow banking system can be subject to some of the same sources of instability that afflicted the commercial banking system before the establishment of the Fed and the FDIC.

Partly as a result of the financial crisis, the size of the shadow banking system has declined relative to the size of the commercial banking system, although shadow banking remains larger. Following the financial crisis, in 2010 Congress passed the Wall Street Reform and Consumer Protection Act, or the Dodd-Frank Act, which to some extent increased federal regulation of the shadow banking system by creating the Federal Stability Oversight Council. But some policymakers and economists continue to believe that shadow banking remains a source of instability in the financial system.

Making the Connection Features

Each chapter includes two to four *Making the Connection* features that present real-world reinforcement of key concepts and help students learn how to interpret what they read online and in newspapers. Most *Making the Connection* features use relevant, stimulating, and provocative news stories, many focused on pressing policy issues. Several of these *Making the Connections* cover topics that apply directly to the personal lives and decisions that students make and include the subtitle *In Your Interest*.

ANSWERING THE KEY QUESTION

Continued from page 139

At the beginning of this chapter, we asked:

"Should the government more closely regulate credit rating agencies?"

Like some other policy questions we will encounter in this book, this one has no definitive answer. We have seen in this chapter that investors often rely on the credit rating agencies for important information on the default risk on bonds. During the financial crisis of 2007–2009, many bonds—particularly mortgage-backed securities—turned out to have much higher levels of default risk than the credit rating agencies had indicated. Some economists and members of Congress argued that the rating agencies had given those bonds inflated ratings because the agencies have a conflict of interest in being paid by the firms whose bond issues they rate. Other economists, though, argued that the ratings may have been accurate when given, but the creditworthiness of the bonds declined rapidly following the unexpected severity of the housing bust and the resulting financial crisis. Despite increased regulation of the rating agencies following the financial crisis, the companies and governments that issue bonds continue to pay the agencies that rate them. It seems unlikely at this point that significant further changes in regulations will occur in the absence of another financial crisis.

CHAPTER

11

Beyond Commercial Banks: Shadow Banks and Nonbank Financial Institutions

Learning Objectives

After studying this chapter, you should be able to:

- 11.1** Explain how investment banks operate (pages 345–362)
- 11.2** Distinguish between mutual funds and hedge funds and describe their roles in the financial system (pages 362–369)
- 11.3** Explain the roles that pension funds and insurance companies play in the financial system (pages 369–374)
- 11.4** Explain the connection between the shadow banking system and systemic risk (pages 374–378)

When Is a Bank Not a Bank? When It's a Shadow Bank!

What is a hedge fund? What is the difference between a commercial bank and an investment bank? At the beginning of the financial crisis of 2007–2009, most Americans and even many members of Congress would have been unable to answer these questions. Most people were also unfamiliar with mortgage-backed securities (MBSs), collateralized debt obligations (CDOs), credit default swaps (CDSs), and other ingredients in the alphabet soup of new financial securities. During the financial crisis, these terms became all too familiar, as economists, policymakers, and the general public came to realize that commercial banks no longer

to borrowers. Instead, a variety of "nonbank" financial institutions, including mutual funds, hedge funds, and investment banks, were acquiring funds that had previously been deposited in banks. They were then using these funds to provide credit that banks had previously provided. These nonbanks were using newly developed financial securities that even long-time veterans of Wall Street often did not fully understand.

At a conference hosted by the Federal Reserve Bank of Kansas City in 2007, just as the financial crisis was beginning, Paul McCulley, a managing director of Pacific Investment Management Company (PIMCO),

MAKING THE CONNECTION IN YOUR INTEREST

How Much Volatility Should You Expect in the Stock Market?

You may be reluctant to invest in the stock market because of the volatility of stock prices. After all, the larger the swings in an asset's price, the greater the risk to you as an investor. But it is possible to measure the degree of volatility that investors expect in the future? Such a measure might give you a way of comparing investing in stocks with investing in other financial assets.

One way to construct such a measure is by using the prices of options. In 1993, Robert E. Whaley, now of Vanderbilt University, noted that the prices of options on stock market indexes—such as the S&P 500—implicitly include a measure of investors' expectations of future market volatility. The measure of volatility is implicit, rather than explicit, because an option's price includes the option's intrinsic value plus other factors, including volatility, that affect the likelihood of an investor exercising the option. Whaley suggested a method to isolate the part of the option's price that represents investors' forecast of volatility.

Using the prices of put and call options on the S&P 500 index, the Chicago Board Options Exchange (CBOE) constructed the Market Volatility Index, called the VIX, to measure the expected volatility in the U.S. stock market over the following 30 days. Many people refer to the VIX as the "fear gauge" because when investors expect volatility in stock prices to increase, they increase their demand for options, thereby driving up their prices and increasing the value of the VIX. The following graph shows movements in the VIX from January 2004 to June 2016:

Volatility: The VIX did not spike in May 2010 and again in 2011, but it did spike in 2008, 2009, and 2015. In February 2006, volatility investors are

Sources: Robert E. Whaley, "Understanding the VIX," *Journal of Portfolio Management*, Vol. 35, No. 3, Spring 2009, pp. 98–105; Robert E. Whaley, "Derivatives on Market Volatility: Hedging Tools Long Overdue," *Journal of Derivatives*, Vol. 1, Fall 1993, pp. 71–84; Saumya Vaishampayan, "Fear Flashes in Options Market, VIX Nearly Doubles," *Wall Street Journal*, August 21, 2015; and Federal Reserve Bank of St. Louis.

See related problem 4.12 at the end of the chapter.

Here are examples:

- “In Your Interest: Interest Rates and Student Loans” (Chapter 3, page 65)
- “In Your Interest: Does Your Portfolio Have Enough Risk?” (Chapter 4, page 100)
- “In Your Interest: Should You Invest in Junk Bonds?” (Chapter 5, page 151)
- “In Your Interest: If Stock Prices Can’t Be Predicted, Why Invest in the Market?” (Chapter 6, page 194)
- “In Your Interest: How Much Volatility Should You Expect in the Stock Market?” (Chapter 7, page 233)
- “In Your Interest: Corporations Are Issuing More Bonds; Should You Buy Them?” (Chapter 9, page 299)
- “In Your Interest: Starting a Small Business? See Your Community Banker” (Chapter 10, page 332)
- “In Your Interest: So, You Want to Be an Investment Banker?” (Chapter 11, page 360)
- “In Your Interest: If You Are Worried About Inflation, Shoud You Invest in Gold?” (Chapter 14, page 484)

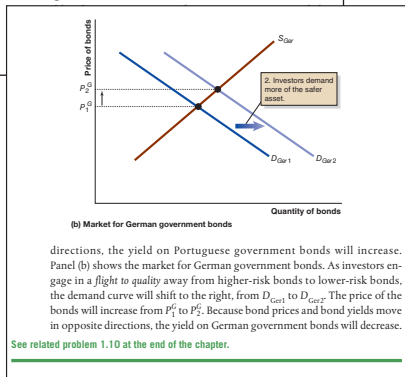
Each *Making the Connection* has at least one supporting end-of-chapter problem to allow students to test their understanding of the topic discussed.

SOLVED PROBLEM 5.1

Political Uncertainty and Bond Yields

In the summer of 2016, as Great Britain voted to leave the European Union (EU), some investors feared that economic instability might increase in the EU as a result of one of its key members leaving. An article in the *Wall Street Journal* noted that, in

particular, investors had become more concerned with the default risk on bonds issued by the governments of Portugal and Greece relative to the default risk on bonds



Solved Problem Features

Many students have difficulty handling problems in applied economics. We help students overcome this hurdle by including worked-out problems in each chapter. Our goals are to keep students focused on the main ideas of each chapter and to give them a model of how to solve an economic problem by breaking it down step by step. Several of these *Solved Problems* cover topics that apply directly to the personal lives and decisions that students make and include the subtitle *In Your Interest*.

Additional exercises in the end-of-chapter *Problems and Applications* section are tied to every *Solved Problem*. Students can also complete related *Solved Problems* on www.myeconlab.com. (See pages xxv-xxvi of this preface for more on MyEconLab.)

Figure 4.4 shows how an increase in firms' expectations of the profitability of investment in physical capital will, holding all other factors constant, shift the supply curve for bonds to the right as firms issue more bonds at any given price. In the figure, as the supply curve for bonds shifts to the right, from S_1 to S_2 , the equilibrium price of bonds falls from \$960 to \$940, and the equilibrium quantity of bonds increases from \$500 billion to \$575 billion. During a recession, firms often become pessimistic about

FIGURE 4.4
Shifts in the Supply Curve of Bonds

An increase in firms' expectations of the profitability of investments in physical capital will, holding all other factors constant, shift the supply curve for bonds to the right as firms issue more bonds at any given price. As the supply curve for bonds shifts to the right, the equilibrium price of bonds falls from \$960 to \$940, and the equilibrium quantity of bonds increases from \$500 billion to \$575 billion. If firms become pessimistic about the profits they could earn from investing in physical capital, then, holding all other factors constant, the supply curve for bonds will shift to the left. As the supply for bonds shifts to the left, the equilibrium price increases from \$960 to \$975, and the equilibrium quantity of bonds decreases from \$500 billion to \$400 billion.

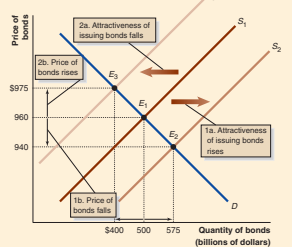


TABLE 4.2 Factors That Shift the Demand Curve for Bonds

All else being equal, an increase in ...	causes the demand for bonds to ...	because ...	Graph of effect on equilibrium in the bond market
wealth	increase	more funds are allocated to bonds.	
expected returns on bonds	increase	holding bonds is relatively more attractive.	
expected inflation	decrease	holding bonds is relatively less attractive.	
expected returns on other assets	decrease	holding bonds is relatively more attractive.	
riskiness of bonds relative to other assets	decrease	holding bonds is relatively less attractive.	
liquidity of bonds relative to other assets	increase	holding bonds is relatively more attractive.	
information costs of bonds relative to other assets	decrease	holding bonds is relatively less attractive.	

Graphs and Summary Tables

We use four devices to help students read and interpret graphs:

1. Detailed captions
2. Boxed notes
3. Color-coded curves
4. Summary tables with graphs


Review Questions and Problems and Applications—Grouped by Learning Objective to Improve Assessment

The end-of-chapter *Review Questions* and *Problems and Applications* are grouped under learning objectives. The goals of this organization are to make it easier for instructors to assign problems based on learning objectives, both in the book and in MyEconLab, and to help students efficiently review material that they find difficult. If students have difficulty with a particular learning objective, an instructor can easily identify which end-of-chapter questions and problems support that objective and assign them as homework or discuss them in class. Exercises in a chapter's *Problems and Applications* section are available in MyEconLab. Using MyEconLab, students can complete these and many other exercises online, get tutorial help, and receive instant feedback and assistance on exercises they answer incorrectly. Each major section of the chapter, paired with a learning objective, has at least two review questions and three problems.

We include one or more end-of-chapter problems that test students' understanding of the content presented in each *Solved Problem*, *Making the Connection*, and chapter opener. Instructors can cover a feature in class and assign the corresponding problem for homework. The *Test Item File* also includes test questions that pertain to these special features.

Data Exercises

Each chapter ends with at least two *Data Exercises* that help students become familiar with a key data source, learn how to locate data, and develop skills to interpret data.

Real-time *Data Analysis Exercises*, marked with , allow students and instructors to use the very latest data from FRED, the online macroeconomic data bank from the Federal Reserve Bank of St. Louis.

Supplements

The authors and Pearson Education have worked together to integrate the text, print, and media resources to make teaching and learning easier.

MyEconLab

MyEconLab is a powerful assessment and tutorial system that works hand-in-hand with *Money, Banking, and the Financial System*, third edition. MyEconLab includes comprehensive homework, quiz, test, and tutorial options, allowing instructors to manage all assessment needs in one program. Key innovations in the MyEconLab course for this edition include the following:

Key Terms and Problems

Key Terms

Bond rating, p. 141	Liquidity premium theory (or preferred habitat theory), p. 162	Segmented markets theory, p. 161
Default risk (or credit risk), p. 141	Municipal bonds, p. 149	Term premium, p. 162
Expectations theory, p. 155	Risk structure of interest rates, p. 140	Term structure of interest rates, p. 152

5.1 The Risk Structure of Interest Rates

Explain why bonds with the same maturity can have different interest rates.

Review Questions

- 1.1 Briefly explain why bonds that have the same maturities often do not have the same interest rates.
 - 1.2 How is a bond's rating related to the bond issuer's creditworthiness?
 - 1.3 How does the interest rate on an illiquid bond compare with the interest rate on a liquid bond? How does the interest rate on a bond with high information costs compare with the interest rate on a bond with low information costs?
 - 1.4 What are the two types of income an investor can earn on a bond? How is each taxed?
 - 1.5 Compare the tax treatment of the coupons on the following three bonds: a bond issued by the city
- a. Do these ratings help explain the difference in the yields on the firms' bonds noted in the chapter opener? Briefly explain.
 - b. At the same time that AMD's bonds had yields above 10%, an article in the *Wall Street Journal* noted that AMD "is angling to lower the cost of virtual reality, targeting the field with a new line of graphics hardware priced at \$199—half or less the cost of comparable products." If AMD is successful in earning large profits from selling its new virtual reality hardware, what is the effect likely to be on its bond yields? Illustrate your answer with a graph showing the market for AMD's bonds.

Source: Don Clark, "AMD Prices 3-D Tech to Spur Virtual Reality Market," *Wall Street Journal*, Mar. 31, 2016.

Problems

- 1.6

5.2 The Term Structure of Interest Rates

Explain why bonds with different maturities can have different interest rates.

Review Questions

- 2.1 In his memoir, former Federal Reserve Chair Ben Bernanke remarked: "In setting longer-term rates, market participants take into account their expectations for the evolution of short-term rates." Explain what he meant.
Source: Ben S. Bernanke, *The Courage to Act: A Memoir of a Crisis and Its Aftermath*, New York: W.W. Norton, & Company, 2015, p. 75.
- 2.2 How does the Treasury yield curve illustrate the term structure of interest rates?
- 2.3 What are three key facts about the term structure?
- 2.4 Briefly describe the three theories of the term structure.

Problems and Applications

- 2.5 [Related to the Chapter Opener on page 139] The chapter opener noted that in mid-2016, you could earn an interest rate of 0.25% by buying that bond matures into a one-year bond with an interest rate of 7% or (c) buy a three-year bond with an interest rate of 8.5%. Assuming annual compounding, no coupon payments, and no cost of buying or selling bonds, which option should you choose?
- 2.7 Suppose that you have \$1,000 to invest in the bond market on January 1, 2018. You could buy a one-year bond with an interest rate of 4%, a two-year bond with an interest rate of 5%, a three-year bond with an interest rate of 6%. You expect interest rates on one-year bonds in the future to be 6.5% on January 1, 2019, 7% on January 1, 2020, and 9% on January 1, 2021. You want to hold your investment until January 1, 2022. Which of the following investment alternatives gives you the highest return by 2022: (a) Buy a four-year bond on January 1, 2014; (b) buy a three-year bond January 1, 2014, and a one-year bond Janu-


Data Exercises

- D5.1: [The yield curve and recessions] Go to the web site of the Federal Reserve Bank of St. Louis (FRED) (fred.stlouisfed.org) and for the period from January 1957 to the present download to the same graph the data series for the 3-month Treasury bill (TB3MS) and the 10-year Treasury note (GS10). Go to the web site of the National Bureau of Economic Research (nber.org) and find the dates for business cycle peaks and troughs (the period between a business cycle peak and trough is a recession). During which months was the yield curve inverted? How many of these periods were followed within a year by a recession?

- D5.2: [Predicting with the yield curve] Go to www.treasury.gov and find the page "Daily Treasury Yield Curve Rates." Briefly describe the current shape of the

yield curve. Can you use the yield curve to draw any conclusion about what investors in the bond market expect will happen to the economy in the future?

- D5.3: [The spread between high-grade bonds and junk bonds] Go to the web site of the Federal Reserve Bank of St. Louis (FRED) (fred.stlouisfed.org) and for the period from January 1997 to the present, download to the same graph the data series for the BofA Merrill Lynch US Corporate AAA Effective Yield (BAMLCOA1CAAAY) and the BofA Merrill Lynch US High Yield CCC or Below Effective Yield (BAMLH0A3HYCEY). Describe how the difference between the yields on high-grade corporate bonds and on junk bonds have changed over this period.

- Real-time *Data Analysis Exercises*, marked with , allow students and instructors to use the very latest data from FRED, the online macroeconomic data bank from the Federal Reserve Bank of St. Louis. By completing the exercises, students become familiar with a key data source, learn how to locate data, and develop skills to interpret data.
- In the Multimedia Library available in MyEconLab, select figures labeled **MyEconLab Real-time data** allow students to display a popup graph updated with real-time data from FRED.
- Current News Exercises provide a turn-key way to assign gradable news-based exercises in MyEconLab. Each week, Pearson locates a current news article, creates an exercise around this article, and then automatically adds it to MyEconLab. Assigning and grading current news-based exercises that deal with the latest macro events and policy issues has never been more convenient.

Other features of MyEconLab include:

- All end-of-chapter *Review Questions* and *Problems and Application*, including algorithmic, graphing, and numerical questions and problems, are available for student practice and instructor assignment. *Test Item File* multiple-choice questions are available for assignment as homework.
- The Custom Exercise Builder allows instructors the flexibility of creating their own problems or modifying existing problems for assignment.
- The powerful Gradebook records each student's performance and time spent on the Tests and Study Plan and generates reports by student or chapter.

A more detailed walk-through of the student benefits and features of MyEconLab can be found at the beginning of this book. Visit www.myeconlab.com for more information and an online demonstration of instructor and student features.

MyEconLab content has been created through the efforts of Melissa Honig, digital studio producer, and Noel Lotz and Courtney Kamauf, digital content project leads.

Access to MyEconLab can be bundled with your printed text or purchased directly with or without the full eText, at www.myeconlab.com.

Instructor's Resource Manual

Ed Scahill of the University of Scranton prepared the *Instructor's Resource Manual*, which includes chapter-by-chapter summaries, learning objectives, extended examples and class exercises, teaching outlines incorporating key terms and definitions, teaching tips, topics for class discussion, and additional applications. The *Instructor's Resource Manual* also contains solutions to the end-of-chapters problems revised by J. Robert Gillette of the University of Kentucky. The *Instructor's Resource Manual* is available for download from the Instructor's Resource Center (www.pearsonhighered.com).

Test Item File

Randy Methenitis of Richland College prepared the *Test Item File*, which includes more than 1,500 multiple-choice and short-answer questions. Test questions are annotated with the following information:

- **Difficulty:** 1 for straight recall, 2 for some analysis, and 3 for complex analysis
- **Type:** Multiple-choice, short-answer, and essay
- **Topic:** The term or concept that the question supports
- **Learning objective:** The major sections of the main text and its end-of-chapter questions and problems are organized by learning objective. The *Test Item File* questions

continue with this organization to make it easy for instructors to assign questions based on the objective they wish to emphasize.

- **Advanced Collegiate Schools of Business (AACSB) Assurance of Learning Standards:**

Communication

Ethical Reasoning

Analytic Skills

Use of Information Technology

Multicultural and Diversity

Reflective Thinking

- **Page number:** The page in the main text where the answer appears allows instructors to direct students to where supporting content appears.
- **Special features in the main book:** Chapter-opening story, *Key Issue and Question*, *Solved Problems*, and *Making the Connections*.

The *Test Item File* is available for download from the Instructor's Resource Center (www.pearsonhighered.com).

TestGen

TestGen is a computerized test generation program, available exclusively from Pearson, that allows instructors to easily create and administer tests on paper, electronically, or online. Instructors can select test items from the publisher-supplied test bank, which is organized by chapter and based on the associated textbook material, or create their own questions from scratch. With both quick-and-simple test creation and flexible and robust editing tools, TestGen is a complete test generator system for today's educators.

PowerPoint Lecture Presentation

Jim Lee of Texas A&M University–Corpus Christi prepared the PowerPoint slides, which instructors can use for classroom presentations and students can use for lecture preview or review. These slides include all the graphs, tables, and equations from the textbook. Student versions of the PowerPoint slides are available as PDF files. These files allow students to print the slides and bring them to class for note taking. Instructors can download these PowerPoint presentations from the Instructor's Resource Center (www.pearsonhighered.com).

This title is available as an eBook and can be purchased at most eBook retailers.

Third Edition Reviewers and Accuracy Checkers

The guidance and recommendations of the following instructors helped us revise the content and features of this text. While we could not incorporate every suggestion from every reviewer, we carefully considered each piece of advice we received. We are grateful for the hard work that went into their reviews and truly believe that the feedback was indispensable in revising this text. We appreciate their assistance in making this the best text it could be; they have helped teach a new generation of students about the exciting world of money and banking:

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First Edition Accuracy Checkers, Class Testers, and Reviewers

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First Edition Reviewers and Focus Group Participants

We appreciate the thoughtful comments of our first edition reviewers and focus group participants. They brought home to us once again that there are many ways to teach a money and banking class. We hope that we have written a text with sufficient flexibility to meet the needs of most instructors. We carefully read and considered every comment and suggestion we received and incorporated many of them into the text. We believe that our text has been greatly improved as a result of the reviewing process.

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A good part of the burden of a project of this magnitude is borne by our families, and we appreciate their patience, support, and encouragement.

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Introducing Money and the Financial System

Learning Objectives

After studying this chapter, you should be able to:

- 1.1** Identify the key components of the financial system (pages 2–15)
- 1.2** Provide an overview of the financial crisis of 2007–2009 (pages 16–19)
- 1.3** Explain the key issues and questions concerning the financial system (pages 19–21)

You Get a Bright Idea ... but Then What?

Suppose it was impossible to borrow or lend money. Maybe life would be better. A character in Shakespeare’s play *Hamlet* advises his son: “Neither a borrower nor a lender be.” Some financial advisers suggest that new college graduates should buy things only with cash—no taking out a loan to buy a car and no putting the purchase of a new bed or refrigerator on a credit card. But could an economy operate successfully without borrowing or lending? We don’t have to guess at the answer because we have examples of economies both in the modern world and in the past where there was little borrowing or lending. The results have been low incomes and very little economic progress.

To see the importance of borrowing and lending to an economy, suppose that you come up with an idea for a company: You design a smartphone application (“app”) that will deliver a textbook chapter to a student’s phone for a limited time for a low price. For example, if a student hasn’t purchased her assigned calculus text but needs to use Chapter 10 to do her homework, the app will make that chapter available for six hours for \$5.¹ You have a lot of work to do to

get your company off the ground—perfecting the software, designing the page in the app store where you will sell it, negotiating with textbook publishers to gain access to their books, and marketing your idea to students. You will have to spend a lot of money before you receive any revenue from sales of the app. Where will you get this money?

You face the same challenge as nearly every other entrepreneur around the world—both today and in the past. The role of the *financial system* is to channel funds from households and other savers to businesses. Businesses need access to funds in order to launch, survive, and grow. They depend on funds the way farms depend on water. For example, consider the large areas of southern Arizona and California’s central valley that have rich soils but receive very little rain. Without an elaborate irrigation system of reservoirs and canals, water would not flow to these areas, and farmers could not raise their vast crops of lettuce, asparagus, cotton, and more. The financial system is like an irrigation system, although money, not water, flows through the financial system.

¹ If you start this company and it succeeds, please remember where you got the idea!

During the economic crisis that began in 2007, the financial system was disrupted, and large sections of the U.S. economy were cut off from the flow of funds they needed to thrive. Just as cutting off the irrigation water in California's San Joaquin Valley would halt the production of crops, the financial crisis resulted in a devastating decline in production of goods and services throughout the economy. The result was the worst economic recession the world had experienced since the Great Depression of the 1930s.

Like engineers trying to repair a damaged irrigation canal to restore the flow of water, officials of the

U.S. Treasury Department and the Federal Reserve (the Fed) took strong actions during the financial crisis to restore the flow of money through banks and financial markets to the firms and households that depend on it. Although some of these policies were controversial, most economists believe that some government intervention was necessary to pull the economy out of a deep recession.

Few households or firms escaped the fallout from the financial crisis and the recession it caused, giving them further evidence that the financial system affects everyone's lives.

In this chapter, we provide an overview of the important components of the financial system and introduce key issues and questions that we will explore throughout the book.

1.1 Key Components of the Financial System

LEARNING OBJECTIVE: Identify the key components of the financial system.

The purpose of this book is to provide you with the tools you need to understand the modern financial system. First, you should be familiar with the three major components of the financial system:

1. Financial assets
2. Financial institutions
3. The Federal Reserve and other financial regulators

We will briefly consider each of these components now and then return to them in later chapters.

Asset Anything of value owned by a person or a firm.

Financial asset An asset that represents a claim on someone else for a payment.

Security A financial asset that can be bought and sold in a financial market.

Financial market A place or channel for buying or selling stocks, bonds, and other securities.

Financial Assets

An **asset** is anything of value owned by a person or a firm. A **financial asset** is a financial claim, which means that if you own a financial asset, you have a claim on someone else to pay you money. For instance, a bank checking account is a financial asset because it represents a claim you have against a bank to pay you an amount of money equal to the dollar value of your account. Economists divide financial assets into those that are *securities* and those that aren't. A **security** is *tradable*, which means it can be bought and sold in a *financial market*. **Financial markets** are places or channels for buying and selling stocks, bonds, and other securities, such as the New York Stock Exchange. If you own a share of stock in Apple or Facebook, you own a security because you can sell that share in the stock market. If you have a checking account at Citibank or Wells Fargo, you can't sell it. So, your checking account is an asset but not a security.

In this book, we will discuss many financial assets. It is helpful to place them into the following five key categories:

1. Money
2. Stocks
3. Bonds
4. Foreign exchange
5. Securitized loans

Money Although we typically think of “money” as coins and paper currency, even the narrowest government definition of *money* includes funds in checking accounts. In fact, economists have a very general definition of **money**: Anything that people are willing to accept in payment for goods and services or to pay off debts. The **money supply** is the total quantity of money in the economy. As we will see in Chapter 2, money plays an important role in the economy, and there is some debate about the best way to measure it.

Stocks **Stocks**, also called *equities*, are financial securities that represent partial ownership of a corporation. When you buy a share of Microsoft stock, you become a Microsoft *shareholder*, and you own part of the firm, although only a tiny part because Microsoft has issued millions of shares of stock. When a firm sells additional stock, it is doing the same thing that the owner of a small firm does when taking on a partner: increasing the funds available to the firm, its *financial capital*, in exchange for increasing the number of the firm’s owners. As an owner of a share of stock in a corporation, you have a legal claim to a part of the corporation’s assets and to a part of its profits, if there are any. Firms keep some of their profits as *retained earnings* and pay the remainder to shareholders in the form of **dividends**, which are payments corporations typically make every quarter.

Bonds When you buy a **bond** issued by a corporation or a government, you are lending the corporation or the government a fixed amount of money. The **interest rate** is the cost of borrowing funds (or the payment for lending funds), usually expressed as a percentage of the amount borrowed. For instance, if you borrow \$1,000 from a friend and pay him back \$1,100 a year later, the interest rate on the loan was $\$100/\$1,000 = 0.10$, or 10%. Bonds typically pay interest in fixed dollar amounts called *coupons*. When a bond *matures*, the seller of the bond repays the principal. For example, if you buy a \$1,000 bond issued by IBM that has a coupon of \$40 per year and a maturity of 30 years, IBM will pay you \$40 per year for the next 30 years, at the end of which IBM will pay you the \$1,000 principal. A bond that matures in one year or less is a *short-term bond*. A bond that matures in more than one year is a *long-term bond*. Bonds can be bought and sold in financial markets, so bonds are securities just as stocks are.

Foreign Exchange Many goods and services purchased in a country are produced outside that country. Similarly, many investors buy financial assets issued by foreign governments and firms. To buy foreign goods and services or foreign assets, a domestic business or a domestic investor must first exchange domestic currency for foreign currency. For example, consumer electronics giant Best Buy exchanges U.S. dollars for

Money Anything that is generally accepted in payment for goods and services or to pay off debts.

Money supply The total quantity of money in the economy.

Stock Financial securities that represent partial ownership of a corporation; also called *equities*.

Dividend A payment that a corporation makes to its shareholders.

Bond A financial security issued by a corporation or a government that represents a promise to repay a fixed amount of money.

Interest rate The cost of borrowing funds (or the payment for lending funds), usually expressed as a percentage of the amount borrowed.

Foreign exchange Units of foreign currency.

Japanese yen when importing Sony televisions. **Foreign exchange** refers to units of foreign currency. The most important buyers and sellers of foreign exchange are large banks. Banks engage in foreign currency transactions on behalf of investors who want to buy foreign financial assets. Banks also engage in foreign currency transactions on behalf of firms that want to import or export goods and services or to invest in physical assets, such as factories, in foreign countries.

Securitization The process of converting loans and other financial assets that are not tradable into securities.

Securitized Loans If you don't have the cash to pay the full price of a car or a house, you can apply for a loan at a bank. Similarly, if a developer wants to build a new office building or shopping mall, the developer can also take out a loan with a bank. Until about 30 years ago, banks made loans with the intention of earning a profit by collecting interest payments on a loan until the borrower paid off the loan. It wasn't possible to sell most loans in financial markets, so loans were financial assets but not securities. Then, the federal government and some financial firms created markets for many types of loans, as we will discuss in Chapter 11. Loans that banks could sell on financial markets became securities, so the process of converting loans into securities is known as **securitization**.

For example, a bank might grant a *mortgage*, which is a loan a borrower uses to buy a home, and sell it to a government agency or a financial firm that will bundle the mortgage together with similar mortgages that other banks granted. This bundle of mortgages will form the basis of a new security called a *mortgage-backed security* that will function like a bond. Just as an investor can buy a bond from IBM, the investor can buy a mortgage-backed security from the government agency or financial firm. The bank that grants, or *originates*, the original mortgages will still collect the interest paid by the borrowers and send those interest payments to the government agency or financial firm to distribute to the investors who have bought the mortgage-backed security. The bank will receive fees for originating the loan and for collecting the loan payments from borrowers and sending them to the issuers of the mortgage-backed securities.

Financial liability A financial claim owed by a person or a firm.

Note that what a saver views as a financial asset a borrower views as a *financial liability*. A **financial liability** is a financial claim owed by a person or a firm. For example, if you take out a car loan from a bank, the loan is an asset from the viewpoint of the bank because it represents your promise to make a certain payment to the bank every month until the loan is paid off. But the loan is a liability to you, the borrower, because you owe the bank the payments specified in the loan.

Financial intermediary A financial firm, such as a bank, that borrows funds from savers and lends them to borrowers.

Financial Institutions

The financial system matches savers and borrowers through two channels: (1) banks and other *financial intermediaries* and (2) *financial markets*. These two channels are distinguished by how funds flow from savers, or lenders, to borrowers and by the financial institutions involved.² Funds flow from lenders to borrowers indirectly through **financial intermediaries**, such as banks, or directly through financial markets, such as the New York Stock Exchange.

² Note that for convenience, we sometimes refer to households, firms, and governments that have funds they are willing to lend or invest as *lenders*, and we refer to households, firms, and governments that wish to use those funds as *borrowers*. These labels are not strictly accurate because the flow of funds does not always take the form of loans. For instance, investors who buy stock are buying part ownership in a firm, not lending money to the firm.

If you get a loan from a bank to buy a car, economists refer to this flow of funds as *indirect finance*. The flow is indirect because the funds the bank lends to you come from people who have put money in checking or savings deposits in the bank; in that sense, the bank is not lending its own funds directly to you. On the other hand, if you buy stock that a firm has just issued, the flow of funds is *direct finance* because the funds are flowing directly from you to the firm.

Savers and borrowers can be households, firms, or governments, both domestic and foreign. Figure 1.1 shows that the financial system channels funds from savers to borrowers, and it channels *returns* back to savers, both directly and indirectly. Savers receive their returns in various forms, including dividend payments on stock, coupon payments on bonds, and interest payments on loans. Funds also flow between financial intermediaries and financial markets as, for example, when a commercial bank buys a bond in a financial market. Figure 1.1 is intended to give an overview of how funds flow

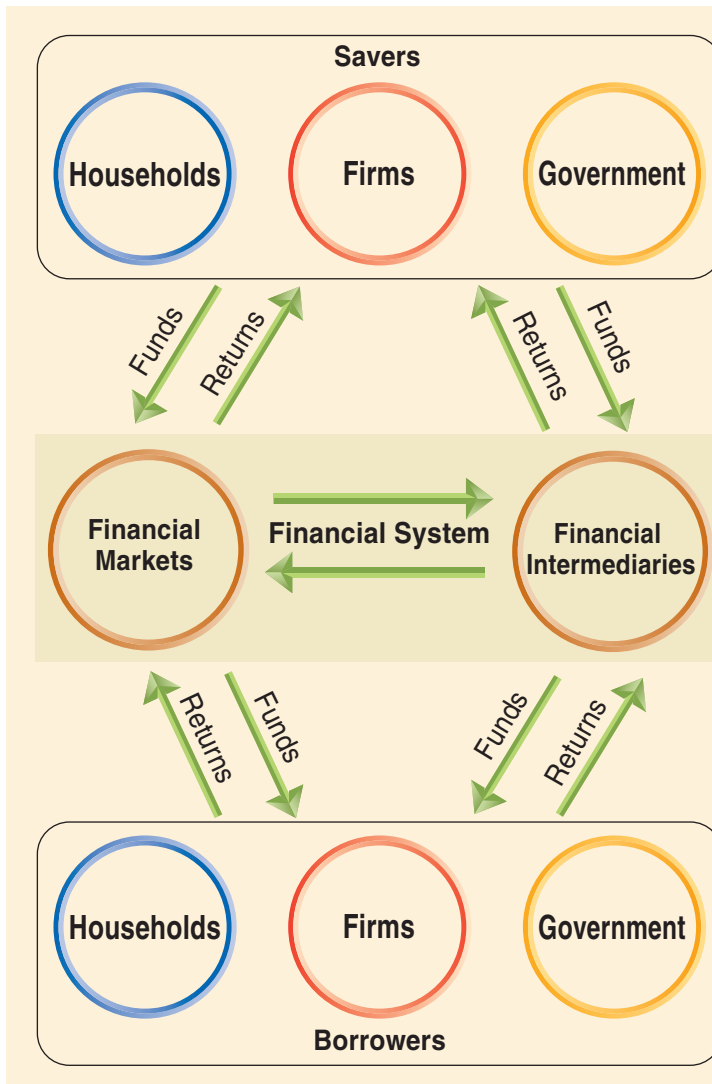


FIGURE 1.1

Moving Funds Through the Financial System

The financial system sends funds from savers to borrowers. Borrowers send returns back to savers through the financial system. Savers and borrowers include domestic and foreign households, businesses, and governments.

through the financial system. We will explain some of the key concepts below, but most of the discussion will be in later chapters.

Commercial bank A financial firm that serves as a financial intermediary by taking in deposits and using them to make loans.

Financial Intermediaries **Commercial banks** are the most important financial intermediaries. Commercial banks play a key role in the financial system by taking in deposits from households and firms and investing most of those deposits, either by making loans to households and firms or by buying securities, such as government bonds or securitized loans. Most households rely on borrowing money from banks when they purchase “big-ticket items,” such as cars or homes. Similarly, many firms rely on bank loans to meet their short-term needs for *credit*, such as funds to pay for inventories (which are goods firms have produced or purchased but not yet sold) or to meet their payrolls. Many firms rely on bank loans to bridge the gap between the time they must pay for inventories or meet their payrolls and when they receive revenues from the sales of goods and services. Some firms also rely on bank loans to meet their long-term credit needs, such as funds they require to physically expand the firm.

In each chapter, the *Making the Connection* feature discusses a news story or another application related to the chapter material. Read the following *Making the Connection* for a discussion of how advances in technology and the difficulty that some households and firms had borrowing money following the financial crisis of 2007–2009 led to the rise of peer-to-peer lending.

MAKING THE CONNECTION

The Rise of Peer-to-Peer Lending and Fintech

Large businesses can raise funds in financial markets by selling stocks and bonds, but small businesses and households don't have this option. Because it's costly for investors to gather information on small businesses, these businesses cannot sell stocks and bonds and must rely instead on loans from banks. Similarly, when individuals and families (which economists refer to as *households*) borrow to buy homes, they typically rely on bank loans. When households borrow to buy cars, appliances, and furniture, they have three options: They can rely on bank loans, on loans provided by the sellers of those goods, or on their own personal credit cards.

At one time, government regulations resulted in most banks being small. Loan officers employed by these small banks often relied on their own judgment and experience in deciding whether to grant loans to local businesses and households. By the 2000s, changes in banking law meant that many small businesses and households were receiving loans from large banks that operated on a regional, or even national, basis. These large banks typically used fixed guidelines for granting loans that left little room for the personal judgment traditionally exercised by loan officers of small banks.

By the mid-2000s, many banks became convinced that it would be profitable to loosen their loan guidelines to make more borrowers eligible to receive credit. These banks believed that the larger number of borrowers who would *default* on their loans because of the looser guidelines would be more than offset by the payments received from the additional borrowers who would now qualify for loans. Unfortunately, during the financial crisis that began in 2007, the number of borrowers defaulting on loans turned out to be much higher than banks had predicted. Loan losses began rising, and by the end of 2009 they were four times greater than at the end of 2007.

In fact, the loan losses during 2007–2009 were by far the largest since the Great Depression of the 1930s. In response to these losses, federal government regulators began pushing banks to tighten their loan guidelines. Banks also became more cautious in making loans as they tried to avoid further losses. As a result of these factors, it became much more difficult for businesses and households to qualify for loans.

New firms, known as *peer-to-peer lenders*, or *marketplace lenders*, began to fill the demand for loans that banks were no longer meeting. Peer-to-peer lending sites, such as LendingClub, Prosper, and SoFi, allow small businesses and households to apply for loans online. The funds for those loans come from three key sources: individuals, other businesses, and—increasingly—financial firms, including insurance companies and pension funds. Banks have traditionally earned a profit on loans by paying a lower interest rate to depositors than they charge to borrowers. In contrast, peer-to-peer lenders make a profit by charging borrowers a one-time fee and charging the people providing funds a fee for collecting the payments from borrowers.

Like banks, peer-to-peer lenders are able to estimate the likelihood that borrowers will pay back loans by using data on a borrower's income, record of paying bills on time, and other aspects of her credit history. Because peer-to-peer lenders take advantage of software that rapidly evaluates information on borrowers, and because they rely heavily on smartphone technology in the loan application process, the lending sites are an example of *financial technology*, or *fintech*. Many borrowers find peer-to-peer lending attractive because the interest rates are lower than those on credit cards. Instead of paying 18% on a credit card balance, a borrower might pay only 10% on a peer-to-peer loan. Following the financial crisis, interest rates on bonds, bank savings accounts, and other financial assets had fallen to historically low levels. So, many investors were willing to make loans at the higher interest rates available on peer-to-peer lending sites even though they could lose money if borrowers defaulted on the loans.

By 2017, peer-to-peer lending was expanding rapidly, although it still remained much smaller than bank lending to small businesses and households. The industry had begun to experience some growing pains. LendingClub and some of the other marketplace lenders had begun securitizing the loans they were making and selling them to investors. In May 2016, LendingClub fired Renaud Laplanche, its chief executive officer (CEO), when the firm's board of directors discovered that LendingClub had not been disclosing all the required information to the investors it sold some loans to. The U.S. Treasury Department was also evaluating whether peer-to-peer lending might require further regulation to protect both borrowers and the investors providing the funds lent on these sites.

It remains to be seen how extensively peer-to-peer lending and the other examples of fintech that we will discuss in this book will affect the flow of funds from lenders to borrowers in the financial system.

Sources: U.S. Department of the Treasury, *Opportunities and Challenges in Online Marketplace Lending*, May 10, 2016; Peter Rudegeair and Anne Steele, "LendingClub CEO Fired over Faulty Loans," *Wall Street Journal*, May 19, 2016; "From the People, for the People," *Economist*, May 9, 2015; and Amy Cortese, "Loans That Avoid Banks? Maybe Not," *New York Times*, May 3, 2014.

See related problem 1.8 at the end of the chapter.

Nonbank Financial Intermediaries Some financial intermediaries, such as *savings and loans*, *savings banks*, and *credit unions*, are legally different from banks, although these “nonbanks” operate in a very similar way by taking in deposits and making loans. Other financial intermediaries include investment banks, insurance companies, pension funds, mutual funds, and hedge funds. Although these institutions don’t at first glance appear to be very similar to banks, they fulfill a similar function in the financial system by channeling funds from savers to borrowers.

Investment Banks Investment banks, such as Goldman Sachs and Morgan Stanley, differ from commercial banks in that they do not take in deposits and until very recently rarely lent directly to households. (In late 2016, Goldman Sachs began engaging in fintech online lending, offering loans of up to \$30,000 to households with high credit card balances but good credit histories.) Instead, they concentrate on providing advice to firms issuing stocks and bonds or considering mergers with other firms. They also engage in *underwriting*, in which they guarantee a price to a firm issuing stocks or bonds and then make a profit by selling the stocks or bonds at a higher price. In the late 1990s, investment banks increased their importance as financial intermediaries by becoming heavily involved in the securitization of loans, particularly mortgage loans. Investment banks also began to engage in *proprietary trading*, which involves earning profits by buying and selling securities.

Insurance Companies Insurance companies specialize in writing contracts to protect their policyholders from the risk of financial losses associated with particular events, such as automobile accidents or fires. Insurance companies collect *premiums* from policyholders, which the companies then invest to obtain the funds necessary to pay claims to policyholders and to cover their other costs. So, for instance, when you buy an automobile insurance policy, the insurance company may lend the premiums you pay to a hotel chain that needs funds to expand.

Pension Funds For many people, saving for retirement is the most important form of saving. Pension funds invest contributions from workers and firms in stocks, bonds, and mortgages to earn the money necessary to pay pension benefit payments during workers’ retirements. With over \$18 trillion in assets in 2016, private and state and local government pension funds are an important source of demand for financial securities.

Mutual Funds A mutual fund, such as Fidelity Investment’s Magellan Fund, obtains money by selling shares to investors. The mutual fund then invests the money in a **portfolio** of financial assets, such as stocks and bonds, typically charging a small management fee for its services. By buying shares in a mutual fund, savers reduce the costs they would incur if they were to buy many individual stocks and bonds. Small savers who have only enough money to buy a few individual stocks and bonds can also lower their investment risk by buying shares in a mutual fund because most mutual funds hold a large number of stocks and bonds. If a firm issuing a stock or a bond declares bankruptcy, causing the stock or bond to lose all of its value, the effect on a mutual fund’s portfolio is likely to be small. The effect might be devastating, though, on a small investor who had invested most of his or her savings in the stock or bond. Because most mutual funds are willing to buy back their shares at any time, they also provide savers with easy access to their money.

Portfolio A collection of assets, such as stocks and bonds.

Hedge Funds Hedge funds, such as Bridgewater, run by Ray Dalio, are similar to mutual funds in that they accept money from investors and use the funds to buy a portfolio of assets. However, a hedge fund typically has no more than 99 investors, all of whom are wealthy individuals or institutions such as pension funds. Hedge funds usually make riskier investments than do mutual funds, and they charge investors much higher fees.

Financial Markets Financial markets are places or channels for buying and selling stocks, bonds, and other securities. Traditionally, financial markets have been physical places, such as the New York Stock Exchange, which is located on Wall Street in New York City, or the London Stock Exchange, which is located in Paternoster Square in London. On these exchanges, dealers would meet face-to-face to trade stocks and bonds. Today, most securities trading takes place electronically between dealers linked by computers and is called “over-the-counter” trading. NASDAQ, which originally stood for the *National Association of Securities Dealers Automated Quotation System*, is an over-the-counter market on which the stocks of many high-tech firms such as Apple and Intel are traded. Stocks and bonds sold in a particular market are “listed” on that market. For instance, General Electric is listed on the New York Stock Exchange, and Apple is listed on NASDAQ.

Economists make a distinction between *primary markets* and *secondary markets*. A **primary market** is a financial market in which stocks, bonds, and other securities are sold for the first time. An *initial public offering (IPO)* refers to a company selling its stock for the first time in the primary market. For example, Facebook’s IPO took place in May 2012. A **secondary market** is a financial market in which investors buy and sell existing securities. For example, if you purchase Facebook stock today and sell it next year, that sale takes place in the secondary market. Primary and secondary markets can be in the same physical—or virtual—place, as when an IPO takes place for a stock listed on the New York Stock Exchange or on NASDAQ.

Primary market A financial market in which stocks, bonds, and other securities are sold for the first time.

Secondary market A financial market in which investors buy and sell existing securities.

MAKING THE CONNECTION

What Do People Do with Their Savings?

If you’re like most college students, your primary financial asset is your checking account. After you begin your career, though, you’ll accumulate a variety of different assets. The Federal Reserve System publishes data on household holdings of financial assets that shows how households divide up their total financial wealth. The following figure compares households’ holdings of financial assets in 1978 and 2016. Some assets, such as stocks and bonds, are supplied by financial markets. Other assets, such as bank deposits and mutual fund shares, are supplied by financial intermediaries.

The figure shows that there have been significant changes over the decades in how households hold their financial wealth. The categories of wealth held in assets supplied by financial markets show that households increased their holdings of stocks issued by corporations from about 14% of their total wealth in 1978 to nearly 19% in 2016. But households now have only about half as much equity in *unincorporated businesses*, which include *partnerships* (businesses that are owned by two or more people