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Financial Management 16e

Theory & Practice

Financial Management

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16e

EUGENE F. BRIGHAM
University of Florida

MICHAEL C. EHRHARDT
University of Tennessee

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***Financial Management: Theory and Practice*, 16th Edition**
Eugene F. Brigham and Michael C. Ehrhardt

Senior Vice President, Higher Ed Product, Content, and Market Development: Erin Joyner

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Learning Designer: Brittany Waitt

Product Assistant: Renee Schnee

Marketing Manager: Christopher Walz

Marketing Coordinator: Sean Messer

Production Service: MPS Limited

Art Director: Chris Doughman

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Intellectual Property Analyst: Reba Frederics

Intellectual Property Project Manager: Carly Belcher

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Cengage
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resource

Students: *Access the* Financial Management: Theory and Practice (16th Edition) *MindTap (**www.cengage.com/login**).*

Instructors: *Access the* Financial Management: Theory and Practice (16th Edition) *instructor resource center by going to **www.cengage.com/login**, logging in with your faculty account username and password, and using ISBN 9781337902601 to reach the site.*

When we wrote the first edition of *Financial Management: Theory and Practice*, we had four goals: (1) to create a text that would help students make better financial decisions; (2) to provide a book that could be used in the introductory MBA course but that was complete enough for use as a reference text in follow-on case courses and after graduation; (3) to motivate students by demonstrating that finance is both interesting and relevant; and (4) to make the book clear enough so that students could go through the material without wasting either their time or their professors' time trying to figure out what we were saying. We have an additional goal for this edition: to explain and apply the 2017 Tax Cuts and Jobs Act to the topics in this book.

We accomplish our goals through the structure and material in the textbook. In addition, MindTap™ for *Financial Management* is a fully integrated online portfolio of teaching tools and learning solutions that facilitate our objectives.

Intrinsic Valuation as a Unifying Theme

Our emphasis throughout the book is on the actions that a manager can and should take to increase the intrinsic value of the firm. Structuring the book around intrinsic valuation enhances continuity and helps students see how various topics are related to one another.

As its title indicates, this book combines theory and practical applications. An understanding of finance theory is essential for anyone developing and/or implementing effective financial strategies. But theory alone isn't sufficient, so we provide numerous examples in the book and the accompanying *Excel* spreadsheets to illustrate how theory is applied in practice. Indeed, we believe that the ability to analyze financial problems using *Excel* also is essential for a student's successful job search and subsequent career. Therefore, many exhibits in the book come directly from the accompanying *Excel* spreadsheets. Many of the spreadsheets also provide brief "tutorials" by way of detailed comments on *Excel* features that we have found to be especially useful, such as Goal Seek, Tables, and many financial functions.

The book begins with fundamental concepts, including background on the economic and financial environment, financial statements (with an emphasis on cash flows), the time value of money, bond valuation, risk analysis, and stock valuation. With this background, we go on to discuss how specific techniques and decision rules can be used to help maximize the value of the firm. This organization provides four important advantages:

1. Managers should try to maximize the intrinsic value of a firm, which is determined by cash flows as revealed in financial statements. Our early coverage of financial statements helps students see how particular financial decisions affect the various parts of the firm and the resulting cash flow. Also, financial statement analysis provides an excellent vehicle for illustrating the usefulness of spreadsheets.

2. Covering the time value of money early helps students see how and why expected future cash flows determine the value of the firm. Also, it takes time for students to digest TVM concepts and to learn how to do the required calculations, so it is good to cover TVM concepts early and often.
3. Most students—even those who do not plan to major in finance—are interested in investments. The ability to learn is a function of individual interest and motivation, so *Financial Management*'s early coverage of securities and security markets is pedagogically sound.
4. Once basic concepts have been established, it is easier for students to understand both how and why corporations make specific decisions in the areas of capital budgeting, raising capital, working capital management, mergers, and the like.

Intended Market and Use

Financial Management is designed primarily for use in the introductory MBA finance course and as a reference text in follow-on case courses and after graduation. There is enough material for two terms, especially if the book is supplemented with cases and/or selected readings. The book can also be used as an undergraduate introductory text for exceptionally good students or where the introductory course is taught over two terms.

Improvements in the 16th Edition

As in every revision, we updated and clarified materials throughout the text, reviewing the entire book for completeness, ease of exposition, and currency. We made hundreds of small changes to keep the text up to date, with particular emphasis on updating the real-world examples and including the latest changes in the financial environment and financial theory. In addition, we made a number of larger changes. Some affect all chapters, some involve reorganizing sections among chapters, and some modify material covered within specific chapters.

Changes That Affect All Chapters

Following are some of the changes that affect all chapters.

THE 2017 TAX CUT AND JOBS ACT (TCJA)

This is a corporate finance book, and corporate taxes affect many topics. We have fully integrated the 2017 Tax Cut and Jobs Act (TCJA) into the text and all ancillaries.

CHANGES IN MICRODRIVE

For many editions we have used a hypothetical company, MicroDrive, as a running example. This provides continuity in the examples from chapter to chapter and helps students apply the material more quickly. When we changed MicroDrive's tax rate to reflect the TCJA, we lost many of the learning points we had built into MicroDrive. To retain those learning points after incorporating the TCJA, we had to revise several other items in MicroDrive's financial statements.

CONTINUED INTEGRATION WITH *EXCEL*

We have continued to integrate the textbook and the accompanying *Excel* ***Tool Kit*** spreadsheet models for each chapter. Many figures in the textbook show the appropriate area from the chapter's *Excel* ***Tool Kit*** model. This makes the analysis more transparent to the students and better enables them to follow the analysis in the *Excel* model.

Notable Changes within Selected Chapters

We made too many small improvements within each chapter to mention them all, but some of the more notable ones are discussed here.

CHAPTER 1: AN OVERVIEW OF FINANCIAL MANAGEMENT AND THE FINANCIAL ENVIRONMENT

We added a brief discussion of income-wealth inequality in Section 1-4b (Intrinsic Stock Value Maximization and Social Welfare). We rewrote much of Section 1-4c (Ethics and Intrinsic Stock Value Maximization), including discussion of illegal actions, alleged unethical actions, and whistleblower protections. In Section 1-6a we describe upcoming changes in the London Interbank Offering Rate (LIBOR) due to recent scandals in how it was reported. Also, we describe the Federal Reserve Board's new alternative to LIBOR, the Secured Overnight Financing Rate (SOFR).

CHAPTER 2: FINANCIAL STATEMENTS, CASH FLOW, AND TAXES

We added two new boxes. The first box, "A Matter of Opinion," highlights the leeway companies have in choosing how to present results and how that leeway complicates comparison. The second box, "Financial Statement Fraud," describes the SEC's Financial Reporting and Audit (FRAud) Group, including a recent case.

CHAPTER 4: TIME VALUE OF MONEY

We replaced the opening vignette with one focused on purchasing a car and how time value of money concepts are vital when getting an auto loan. In Section 4-17c we now show how to determine directly the remaining balance on an amortizing loan without building an entire amortization schedule. We added Section 4-17e to explain how the calculation of monthly interest expenses for many auto loans differs from that of mortgages.

CHAPTER 5: BONDS, BOND VALUATION, AND INTEREST RATES

We added a new box describing a 1648 perpetual bond, "You Can Take That to the Bank."

CHAPTER 7: CORPORATE VALUATION AND STOCK VALUATION

We added a section, 7-7d, showing how to calculate the value of operations at each year, not just at the horizon and at t = 0. We also added several new end-of-chapter problems on free cash flow valuation that will be ideal for homework assignments using the algorithmic feature in MindTap.

CHAPTER 9: THE COST OF CAPITAL

We added Section 9-3c, which discusses the difference between the yield to maturity and the expected rate of return based on projected default rates, showing that the difference between the yield and the expected rate of return is so small that it can be ignored for the vast majority of bonds. Sections 9-3d and 9-3e describe how to estimate the after-tax cost for newly issued debt that has large flotation costs.

CHAPTER 11: CASH FLOW ESTIMATION AND RISK ANALYSIS

We revised the example company so that it reflects the TCJA but retains key learning points. We added a description of bonus depreciation to Appendix 11A and used the Scenario Manager to create scenarios in the ***Tool Kit*** showing the impact of

different depreciation methods. We also added bonus depreciation to the Mini-Case and *PowerPoint* show because it is part of the TCJA.

CHAPTER 15: CAPITAL STRUCTURE DECISIONS

We describe the impact that the TCJA's reduced corporate tax rate has on the value of the tax shield with respect to the M&M models and the Miller model. We incorporated the new tax rate into Section 15-6 and our discussion of the optimal capital structure. Due to the TCJA's lower corporate tax rate and its limitation on interest expense deductions, the optimal capital structure will have less debt than before the TCJA. We moved our discussion of bond refunding operations to the new ***Web Extension 15B***.

CHAPTER 16: SUPPLY CHAINS AND WORKING CAPITAL MANAGEMENT

We added a new opening vignette focusing on the companies that are best at managing the cash conversion cycle.

CHAPTER 17: MULTINATIONAL FINANCIAL MANAGEMENT

We added a new box, "Meet Me at the Car Wash," describing international bribery by several Brazilian companies. We reorganized and rewrote much of Section 17-3, "Exchange Rates," to explicitly describe exchanges among all combinations of direct and indirect currencies. Section 17-5a, "Determinants of Floating Exchange Rates," now includes Table 17-3 showing U.S. trade balances with key trading partners.

CHAPTER 18: PUBLIC AND PRIVATE FINANCING: INITIAL OFFERINGS, SEASONED OFFERINGS, AND INVESTMENT BANKS

We expanded Section 18-1 to address carried interest, unicorns, investment firms that manage multiple venture capital funds, and publicly traded companies with divisions/subsidiaries that provide funding to start-ups.

CHAPTER 19: LEASE FINANCING

We rewrote Sections 19-2 and 19-3 to reflect the virtual elimination of off-balance sheet accounting due to Accounting Standards Update (ASU) 2016-02. We added a new section, 19-7, to explicitly address the TCJA: "Leases, Taxes, and the 2017 Tax Cuts and Jobs Act."

CHAPTER 20: HYBRID FINANCING: PREFERRED STOCK, WARRANTS, AND CONVERTIBLES

We added a new opening vignette discussing Tesla's convertible bonds, Elon Musk's tweets about going private, and the subsequent actions by the SEC and Tesla.

CHAPTER 22: MERGERS AND CORPORATE CONTROL

We reorganized and rewrote much of the chapter to better integrate changes due to the TCJA. Parts of Section 22-1, "Rationale for Mergers," now include the impact of the TCJA regarding restrictions on carry-forward losses from potential targets and limits on interest expense deductions in highly levered acquisitions. Section 22-2, "Types of Mergers," now includes a brief explanation of roll-up mergers and a new section explaining the relationship between acquisition method (exchange of stock, cash offer to purchase assets, and cash offer to purchase shares) and responsibility for any hidden liabilities. We consolidated our coverage of takeover defenses into Section 22-4b, "Hostile Takeovers." Section 22-13, "Merger Tax Treatments," explains the tax treatments of the types of mergers from Section 22-4.

Digging Deeper with *Web Extensions*

Many chapters have Adobe PDF "appendices" that provide more detailed coverage of specialized topics related to the chapter's content. For example, ***Web Extension 9A*** explains how to estimate the required rate of return for stocks that have nonconstant dividends and repurchases prior to the forecast horizon.

Four additional chapters are available online for those instructors wishing to cover in depth several other financial issues. For example, a detailed discussion of pension plan management is in ***Web Chapter 29***.

Digital Course Solutions for Instructors and Students

MindTap is Cengage Learning's fully online, highly personalized learning experience that combines readings, assessments, multimedia, and activities into a singular Learning Path. Using MindTap, an instructor can easily organize a course that guides students through the class with ease and engagement. Instructors can personalize the Learning Path for their students by customizing the robust suite of *Financial Management's* resources and adding their own content via apps that integrate into the MindTap framework seamlessly with Learning Management Systems.

Instructors: You can access all resources by going to **www.cengage.com/login**, logging in with a faculty account username and password, and using ISBN 9781337902601 to search for and add resources to your account.

Enriching the Student Learning Experience

MindTap provides multiple learning resources that enable students to understand each chapter's concepts and financial applications.

MBA Refresher Pre-/Post-Test

These diagnostic multiple-choice questions will allow students to review specific topics within key prerequisite disciplines—finance, accounting, statistics, economics, and algebra/math—while testing skills in using *Excel* and a financial calculator. Once feedback from the pre-test is reviewed, the post-test will confirm mastery of key topics.

ConceptClips

Available in MindTap and its eBook, finance ConceptClips present fundamental key topics to students in an entertaining and memorable way via short animated video clips. Developed by Mike Brandl of The Ohio State University, these vocabulary animations provide students with a memorable auditory and visual representation of the important terminology for the course.

Excel Tool Kits

Proficiency with spreadsheets is an absolute necessity for all MBA students. With that in mind, we created *Excel* spreadsheets for each chapter, called ***Tool Kits***, that calculate all numerical examples, tables, and figures. In addition to greater transparency within numerical examples, the ***Tool Kits*** explain in detail many of *Excel*'s most useful features and functions that students will find invaluable in their courses and careers.

Excel Online

In addition to the *Excel* ***Tool Kit*** files that directly explain examples in the text, **Microsoft® *Excel* Online** activities provide students with an opportunity to work auto-gradable, algorithmic homework problems directly in their browser. Students receive instant feedback on their *Excel* work, including the "by hand" calculations and a solution file containing a recommended way of solving the problem. Students' *Excel* work is saved in real time in the cloud; is platform, device, and browser independent; and is always accessible with their homework without cumbersome file uploads and downloads. This unique integration represents a direct collaboration between Cengage and Microsoft to strengthen and support the development of Microsoft Office education skills for success in the workplace.

Blueprint Problems

Blueprint Practice Problems available in MindTap teach students finance concepts and their associated building blocks—going beyond memorization. By going through the problem step by step, they reinforce foundational concepts and allow students to demonstrate their understanding of the problem-solving process and business impact of each topic. Blueprints include rich feedback and explanations, providing students with an excellent learning resource to solidify their understanding.

Exploring Finance

Exploring Finance offers instructors and students interactive visualizations that engage with "lean forward" interactivity. Instructors can use these visual, interactive tools to help students "see" the financial concept being presented directly within MindTap.

Problem Walk-Through Videos

Nearly 260 **Problem Walk-Through** videos are embedded in the online homework. Each video walks students through solving a problem from start to finish, and students can play and replay the tutorials as they work through homework assignments or prepare for quizzes and tests, almost as though they had an instructor by their side the whole time.

Adaptive Test Prep (ATP)

Adaptive Test Prep allows students to create practice quizzes covering multiple chapters in a low-stakes environment. Students receive immediate feedback so they know where they need additional help. In addition, the questions have the same formats as those in the actual test bank, prepare students for what to expect on an exam. With many questions offered per chapter, students can create multiple unique practice quizzes within MindTap.

Classroom Activities

Many of the preceding resources provide an excellent basis for classroom discussions. In addition, each chapter has a Mini Case describing a business situation spanning the chapter's topics. Some professors choose to assign the Mini Cases as graded assignments due at the beginning of class, whereas others use the Mini Cases to provide structure for class discussions or lectures.

Mini Case *PowerPoint* Slides

Each chapter has a set of *PowerPoint* slides that present graphs, tables, lists, and calculations for use in lectures. Although the slides correspond to the Mini Cases at the end of the chapter, the slides are completely self-contained in the sense that they can be used for discussions and lectures regardless of whether students have read the Mini Cases. In fact, we often don't assign the Mini Case, but we do use the *PowerPoint* slides.

Instructors can easily customize the slides and convert them quickly into any *PowerPoint* Design Template.[1] If you add some of your own slides or modify the existing slides to better illustrate important concepts, please share your changes with us—many of our best learning points have come from instructors, and we appreciate all suggestions for ways to improve learning experiences for students.

Mini Case *Excel* Spreadsheets

In addition to the *PowerPoint* slides, we also provide *Excel* spreadsheets that perform the calculations required in the Mini Cases. These spreadsheets are similar to the ***Tool Kits*** but with two differences. (1) The numbers correspond to the Mini Cases rather than to the chapter examples. (2) We added some features that enable what-if analysis on a real-time basis in class.

We usually begin class with the *PowerPoint* presentation, but after we have explained a basic concept, we "toggle" to the Mini Case *Excel* file and show how the analysis can be done in *Excel*.[2] For example, when teaching bond pricing, we begin with the *PowerPoint* show and cover the basic concepts and calculations. Then we toggle to *Excel* and use a sensitivity-based graph to show how bond prices change as interest rates and time to maturity vary. We encourage students to bring their laptops to class so that they can follow along and do the what-if analysis for themselves.

Evaluating the Student Learning Experience

MindTap provides multiple resources enabling instructors to measure student learning. Some are ideal for online assignments, and others are best as hand-graded cases and exercises.

Algorithmic Homework Assignments That Are Unique to Each Student

One of our favorite MindTap features allows us to quickly create a homework assignment drawn from end-of-chapter problems and test bank problems. We usually include numerical fill-in-the-blank problems that algorithmically generate different inputs for each student.

When our primary objective is to foster learning, we enable students to check their answer for a problem before moving on to the next problem. We allow either three attempts or unlimited attempts, depending on the problem's difficulty. Sometimes we allow a problem to provide hints and feedback if the student's answer is wrong.

[1]To convert into a different design template in *PowerPoint* for Office 365, select Design, Theme, and choose a theme. Always double-check the conversion; some templates use fonts of different sizes, which can cause some slide titles to run over their allotted space.

[2]To toggle between two open programs, such as *Excel* and *PowerPoint*, hold the Alt key down and hit the Tab key until you have selected the program you want to show.

When our primary objective is assessment, we disable the multiple attempts feature. We always allow feedback on each question after the assignment's due date.

MindTap automatically grades the assignment and posts grades to the MindTap gradebook. MindTap can also post grades to learning management systems such as Canvas.

We assign homework early and often: Each assignment covers only several class periods and is due shortly after covering those classes. We find that this encourages students to keep up with the course, which enhances their learning experience.

Finance in Action

MindTap offers a series of Finance in Action analytical cases that assess students' ability to perform at a higher level of understanding, critical thinking, and decision making.

End-of-Chapter Spreadsheet Problems

Each chapter has a *Build a Model* problem, where students start with a spreadsheet that contains financial data plus general instructions for solving a specific problem. The *Excel* model is available in MindTap and is partially completed, with headings but no formulas—the student must literally build a model. This structure guides the student through the problem, minimizes unnecessary typing and data entry, and also makes it easy to grade the work because all students' answers are in the same locations on the spreadsheet.

The completed solutions to the *Build a Model*s are located in the Instructor Resource Center.

Cognero™ Test Bank and Testing Software

Cengage Learning Testing Powered by Cognero™ is a flexible online system that allows you to author, edit, and manage test bank content from multiple Cengage Learning solutions; create multiple test versions in an instant; deliver tests from your LMS, your classroom, or wherever you want. The Cognero™ Test Bank contains the same questions that are in the Microsoft *Word* Test Bank. All question content is now tagged according to Tier I (Business Program Interdisciplinary Learning Outcomes) and Tier II (finance-specific) standards topic, Bloom's Taxonomy, and difficulty level.

CengageCompose

More than 100 cases, written by Eugene F. Brigham, Linda Klein, and Chris Buzzard, are available via CengageCompose, Cengage Learning's online case library. These cases are in a customized case database that allows instructors to select cases and create their own customized casebooks. Most of the cases have accompanying spreadsheet models that, while not essential for working the case, do reduce number crunching and thus leave more time for students to consider conceptual issues. The models also show students how computers can be used to make better financial decisions. Cases that we have found particularly useful for the different chapters are listed in the end-of-chapter references. The cases, case solutions, and spreadsheet models can be previewed and ordered by professors at **http://compose.cengage.com.**

Cengage Learning Custom Solutions

Whether you need print, digital, or hybrid course materials, Cengage Learning Custom Solutions can help you create your perfect learning solution. Draw from Cengage Learning's extensive library of texts and collections, add your own original work, and/or

create customized media and technology to match your learning and course objectives. Our editorial team will work with you through each step, allowing you to concentrate on the most important thing—your students. Learn more about all our services at **www.cengage.com/custom.**

Solutions Manual

This comprehensive manual contains worked-out solutions to all end-of-chapter questions and problems. It also includes additional explanatory notes with its answers to the end-of-chapter Mini Cases. It is available at the Instructor Resource Center.

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Errors in the Text

At this point, authors generally say something like this: "We appreciate all the help we received from the people just listed, but any remaining errors are, of course, our own responsibility." And in many books, there are plenty of remaining errors. Having experienced difficulties with errors ourselves, both as students and as instructors, we resolved to avoid this problem in *Financial Management*. As a result of our error-detection procedures, we are convinced that the book is relatively free of mistakes.

Partly because of our confidence that few such errors remain, but primarily because we want to detect any errors in the textbook that may have slipped by so that we can correct them in subsequent printings, we decided to offer a reward of $10 per error to the first person who reports a textbook error to us. For purposes of this reward, errors in the textbook are defined as misspelled words, nonrounding numerical errors, incorrect statements, and any other error that inhibits comprehension. Typesetting problems such as irregular spacing and differences in opinion regarding grammatical or punctuation conventions do not qualify for this reward. Also, given the ever changing nature of the Internet, changes in Web addresses do not qualify as errors, although we would appreciate reports of changed Web addresses. Finally, any qualifying error that has follow-through effects is counted as two errors only. **Please report any errors to Michael C. Ehrhardt at the e-mail address shown next in the Conclusion.**

Conclusion

Finance is, in a real sense, the cornerstone of the free enterprise system. Good financial management is therefore vitally important to the economic health of business firms, hence to the nation and the world. Because of its importance, corporate finance should be thoroughly understood. However, this is easier said than done—the field is relatively complex, and it is undergoing constant change in response to shifts in economic conditions. All of this makes corporate finance stimulating and exciting but also challenging and sometimes perplexing. We sincerely hope that *Financial Management: Theory and Practice* will help readers understand and solve the financial problems businesses face today.

Michael C. Ehrhardt
University of Tennessee
Ehrhardt@utk.edu

Eugene F. Brigham
University of Florida
Gene.Brigham@cba.ufl.edu

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PART 1

The Company and Its Environment

CHAPTER 1

An Overview of Financial Management and the Financial Environment

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See **http://fortune.com/worlds-most-admired-companies** *for updates on the rankings.*

In a global beauty contest for companies, the winner is . . . Apple.

Or at least Apple is the most admired company in the world, according to *Fortune* magazine's annual survey. The others in the global top ten are Amazon.com, Starbucks, Berkshire Hathaway, Disney, Alphabet (formerly Google), General Electric, Southwest Airlines, Facebook, and Microsoft. What do these companies have that separates them from the rest of the pack?

Based on a survey of executives, directors, and security analysts, these companies have very high average scores across nine attributes: (1) innovativeness, (2) quality of management, (3) long-term investment value, (4) social responsibility, (5) people management, (6) quality of products and services, (7) financial soundness, (8) use of corporate assets, and (9) effectiveness in doing business globally. After culling weaker companies, the final rankings are then determined by over 3,800 experts from a wide variety of industries.

What makes these companies special? In a nutshell, they reduce costs by having innovative production processes, they create value for customers by providing high-quality products and services, and they create value for employees by training and fostering an environment that allows employees to utilize all of their skills and talents. As you will see throughout this book, the resulting cash flow and superior return on capital also create value for investors.

resource

The textbook's Web site has tools for teaching, learning, and conducting financial research.

This chapter should give you an idea of what financial management is all about, including an overview of the financial markets in which corporations operate. Before going into details, let's look at the big picture.

1-1 The Five-Minute MBA

Okay, we realize you can't get an MBA in five minutes, but we can sketch the key elements of an MBA education. The primary objective of an MBA program is to provide managers with the knowledge and skills they need to run successful companies, so we start there.

First, *successful companies have skilled people* at all levels inside the company, including leaders, managers, and a capable workforce. Skilled people enable a company to identify, create, and deliver products or services that are highly valued by customers—so highly valued that customers choose to purchase from them rather than from their competitors.

Second, *successful companies have strong relationships* with groups outside the company. For example, successful companies develop win–win relationships with suppliers and excel in customer relationship management.

Third, *successful companies have enough funding* to execute their plans and support their growing operations. Companies can reinvest a portion of their earnings, but most growing companies also must raise additional funds externally by some combination of selling stock and/or borrowing in the financial markets. To do this, a company must provide investors with high enough returns to compensate them for the use of their money and their exposure to risk.

To help your company succeed, you must have the skills necessary to evaluate any proposal or idea, whether it relates to marketing, supply chains, production, strategy, mergers, or any other area. In a nutshell, that is what we will do in this book.

SELF-TEST

What are three attributes of successful companies?

What financial skills must every successful manager have?

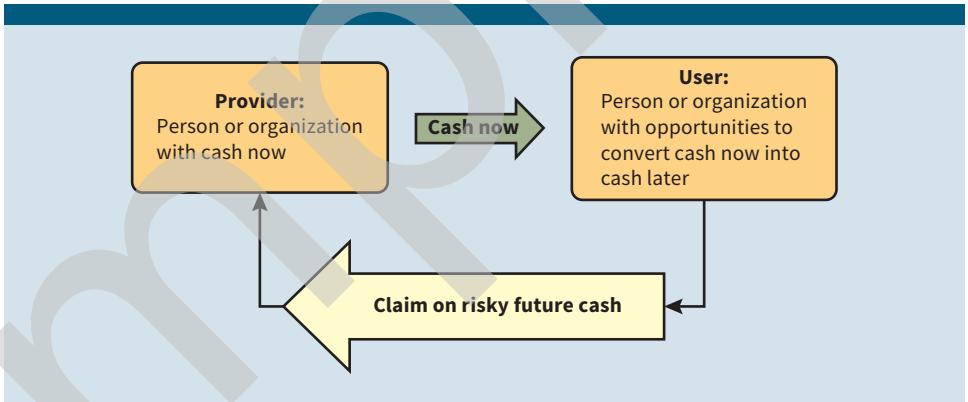
1-2 Finance from 40,000 Feet Above

A bird's-eye view showing the big picture of finance will help you keep track of its individual components. It all starts with individuals or organizations that have more cash than they presently want to spend (i.e., providers of cash now) and others with opportunities to generate cash in the future (i.e., users of cash now). For example, providers of cash include individuals who are saving for retirement, banks willing to make loans, and many other types of investors. Users of cash include: (1) students wishing to borrow money for tuition and planning to repay it with future earnings after graduating, (2) entrepreneurs with ideas, and (3) corporations with growth plans.

Figure 1-1 shows the relationship between providers and users.

Two problems immediately present themselves. First, how do the providers and users identify one another and exchange cash now for claims on risky future cash? Second, how can potential providers evaluate the users' opportunities? In other words, are the claims on risky future cash flows sufficient to compensate the providers for giving up their cash today? At the risk of oversimplification, **financial markets** are simply ways of connecting providers with users, and **financial analysis** is a tool to evaluate risky opportunities.

FIGURE 1-1
Providers and Users: Cash Now versus Claims on Risky Future Cash



We cover many topics in this book, and it can be easy to miss the forest for the trees. As you read about a particular topic, think about how the topic is related to the role played by financial markets or the tools used to evaluate claims on future cash flows.

We begin with an especially important type of user: companies that are incorporated.

SELF-TEST

What do providers supply? What do providers receive?

What do users receive? What do users offer?

What two problems are faced by providers and users?

1-3 The Corporate Life Cycle

Apple began life in a garage, and Facebook started in a dorm room. How is it possible for such companies to grow into the giants we see today? The following sections describe some typical stages in the corporate life cycle.

1-3a Starting Up as a Proprietorship

Many companies begin as a **proprietorship**, which is an unincorporated business owned by one individual. Starting a business as a proprietor is easy—obtain any required city or state business licenses and begin business operations. The proprietorship has three important advantages: (1) It is easy and inexpensive to start. (2) Relatively few government regulations affect it. (3) It pays no corporate income tax on profits—instead, they are included in the proprietor's personal taxable income.

However, the proprietorship also has three important limitations: (1) It may be difficult for a proprietorship to obtain the funding needed for growth. (2) The proprietor has unlimited personal liability for the business's debts, which can result in losses that exceed the money invested in the company. (Creditors may even be able to seize a proprietor's house or other personal property!) (3) The life of a proprietorship is limited to the life of its founder. Therefore, usually only small businesses operate as sole proprietorships. In fact, about 73% of all companies are proprietorships, accounting for less than 5% of all sales revenue.

1-3b More Than One Owner: A Partnership

Some companies start with more than one owner, and some proprietors decide to add a partner as the business grows. A **partnership** exists whenever two or more persons or entities associate to conduct a noncorporate business for profit. Partnerships may operate under different degrees of formality, ranging from informal, oral understandings to formal agreements filed with the secretary of the state in which the partnership was formed. Partnership agreements define the ways any profits and losses are shared between partners. A partnership's advantages and disadvantages are similar to those of a proprietorship.

Regarding liability, partners potentially can lose all of their personal assets in the event of bankruptcy because each partner is liable for the business's debts. To avoid this, the liabilities of some of the partners can be limited by establishing a **limited partnership**. **Limited partners** can lose only the amount of their investment in the partnership, but the **general partners** have unlimited liability. However, the limited partners typically have no control—which rests solely with the general partners—and their returns are likewise limited. Limited partnerships are common in real estate, oil, equipment-leasing ventures, and venture capital. However, they are not widely used in other businesses because usually no partner is willing to be the general partner due to the risk, and no partners are willing to be limited partners with no control.

In regular and limited partnerships, at least one partner is liable for the partnership's debts. However, in a **limited liability partnership (LLP)** and a **limited liability company (LLC)**, all partners' (or members') potential losses are limited to their investment in the LLP. Of course, this arrangement increases the risk faced by an LLP's lenders, customers, and suppliers.

1-3c Many Owners: A Corporation

Most partnerships have difficulty attracting substantial amounts of capital to support growth. Thus, many growth companies begin as a proprietorship or partnership but subsequently convert to a corporation. Other companies, in anticipation of growth, actually begin as corporations.

A **corporation** is a legal entity created under state laws, and it is separate and distinct from its owners and managers. This separation gives the corporation three major advantages: (1) *unlimited life*—a corporation can continue after its original owners and managers are deceased; (2) *easy transfers of ownership interests*—ownership is divided into shares of stock, which can be transferred far more easily than ownership in a proprietorship or partnership; and (3) *limited liability*—losses are limited to the actual funds invested.

To illustrate limited liability, suppose you invested $10,000 in a partnership that then went bankrupt and owed $1 million. Because partners are liable, you could be held liable for the entire $1 million if your partners could not pay their shares. However, if you invested $10,000 in a corporation's stock, your potential loss in a bankruptcy would be limited to your $10,000 investment.

Unlimited life, easy transfers of ownership, and limited liability make it much easier for corporations to raise money in the financial markets and grow into large companies. Although the corporate form offers significant advantages relative to proprietorships and partnerships, it has two disadvantages: (1) Corporate earnings may be subject to double taxation—the earnings of the corporation are taxed at the corporate level, and then earnings paid out as dividends are taxed again as income to the stockholders. (2) Setting up a corporation involves preparing a charter, writing a set of bylaws, and filing the many

required state and federal reports, which is more complex and time-consuming than creating a proprietorship or a partnership.

The **charter** includes the following information: (1) name of the proposed corporation, (2) types of activities it will pursue, (3) amount of capital stock, (4) number of directors, and (5) names and addresses of directors. The charter is filed with the secretary of the state in which the firm will be incorporated, and when it is approved, the corporation is officially in existence.[1] After the corporation begins operating, quarterly and annual employment, financial, and tax reports must be filed with state and federal authorities.

The **bylaws** are a set of rules drawn up by the founders of the corporation. Bylaws specify: (1) how directors are to be elected (all elected each year or perhaps one-third each year for 3-year terms), (2) whether the existing stockholders will have the first right to buy any new shares the firm issues, and (3) procedures for changing the bylaws themselves, should conditions require it.

There are several different types of corporations. Professionals such as doctors, lawyers, and accountants often form a **professional corporation (PC)** or a **professional association (PA)**. These types of corporations do not relieve the participants of professional (malpractice) liability. Indeed, the primary motivation behind the professional corporation was to provide a way for groups of professionals to avoid certain types of unlimited liability yet still be held responsible for professional liability.

Finally, some corporations can elect to be taxed as if the business were a proprietorship or partnership if the corporation meets certain requirements regarding size and number of stockholders. Such firms are called **S corporations**.

1-3d Growing a Corporation: Going Public

After a company incorporates, how does it evolve? When entrepreneurs start a company, they usually provide all the financing from their personal resources, which may include savings, home equity loans, or even credit cards. A fast-growing business must continue to invest in buildings, equipment, technology, and employees. Such investments usually deplete the founders' resources, so they turn to external financing. Many young companies are too risky for banks, so the founders must sell stock to outsiders, including friends, family, private investors (often called "angels"), or venture capitalists.

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For updates on IPO activity, see **www.renaissancecapital.com/IPO-Center**. *Also, see Professor Jay Ritter's Web site for additional IPO data and analysis,* **https://site.warrington.ufl.edu/ritter/ipo-data/**.

Any corporation can raise funds by selling shares of its stock, but government regulations restrict the number and type of investors who can buy the stock. Also, the shareholders cannot subsequently sell their stock to the general public. Due to these limitations, the shares are called **closely held stock** and the company is a **closely held corporation**.

As it continues to grow, a thriving private corporation may decide to seek approval from the **Securities and Exchange Commission (SEC)**, which regulates stock trading, to sell shares in a public stock market.[2] It does so by filing a **prospectus** with the SEC, which provides relevant information about the company to investors and regulators. In addition to SEC approval, the company applies to be a **listed stock** on

[1]About 64% of major U.S. corporations are chartered in Delaware, which has, over the years, provided a favorable legal environment for corporations. It is not necessary for a firm to be headquartered or even to conduct operations in its state of incorporation or even in its country of incorporation.

[2]The SEC is a government agency created in 1934 to regulate matters related to investors, including the regulation of stock markets.

an SEC-registered stock exchange. For example, the company might list on the **New York Stock Exchange (NYSE)**, which is the oldest registered stock exchange in the United States and is the largest exchange in the world when measured by the market value of its listed stocks. Or perhaps the company might list on the **NASDAQ Stock Market**, which has the most stock listings, especially among smaller, high-tech companies.

Going public is called an **initial public offering (IPO)** because it is the first time the company's shares are sold to the general public. In most cases, an **investment bank**, such as Goldman Sachs, helps with the IPO by advising the company. In addition, the investment bank's company usually has a **brokerage firm**, which employs **brokers** who are registered with the SEC to buy and sell stocks on behalf of clients.[3] These brokers help the investment banker sell the newly issued stock to investors.

Most IPOs raise proceeds in the range of $90 million to $140 million. However, some IPOs are huge, such as the $21.7 billion raised by Alibaba when it went public on the NYSE in 2014. Not only does an IPO raise additional cash to support a company's growth, but the IPO also makes it possible for the company's founders and investors to sell some of their own shares, either in the IPO itself or afterward as shares are traded in the stock market. For example, in Facebook's 2012 IPO, the company raised about $6.4 billion by selling 180 million new shares, and the owners received almost $9.2 billion by selling 241 million of their own shares.

Most IPOs are underpriced when they are first sold to the public, based on the initial price paid by IPO investors and the closing price at the end of the first day's trading. For example, in 2017 the average first-day return was around 15%.

Even if you are able to identify a "hot" issue, it is often difficult to purchase shares in the initial offering. In strong markets, these deals generally are oversubscribed, which means that the demand for shares at the offering price exceeds the number of shares issued. In such instances, investment bankers favor large institutional investors (who are their best customers), and small investors find it hard, if not impossible, to get in on the ground floor. They can buy the stock in the aftermarket, but evidence suggests that if you do not get in on the ground floor, the average IPO underperforms the overall market over the long run.[4]

Before you conclude that it isn't fair to let only the best customers have the stock in an initial offering, think about what it takes to become a best customer. Best customers are usually investors who have done lots of business in the past with the investment banking firm's brokerage department. In other words, they have paid large sums as commissions in the past, and they are expected to continue doing so in the future. As is so often true, there is no free lunch—most of the investors who get in on the ground floor of an IPO have, in fact, paid for this privilege.

After the IPO, it is easier for a public firm to raise additional funds to support growth than it is for a private company. For example, a public company raises more funds by selling (i.e., issuing) additional shares of stock through a **seasoned equity offering**, which is much simpler than the original IPO. In addition, publicly traded companies also have better access to the debt markets and can raise additional funds by selling bonds.

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[3]For example, stockbrokers must register with the **Financial Industry Regulatory Authority (FINRA)**, a nongovernment organization that watches over brokerage firms and brokers. FINRA is the biggest, but there are other self-regulatory organizations (SROs). Be aware that not all self-advertised "investment advisors" are actually registered stockbrokers.

[4]See Jay R. Ritter, "The Long-Run Performance of Initial Public Offerings," *Journal of Finance*, March 1991, pp. 3–27.

1-3e Managing a Corporation's Value

How can managers affect a corporation's value? To answer this question, we first need to ask, "What determines a corporation's value?" In a nutshell, it is *a company's ability to generate cash flows now and in the future*.

In particular, a company's value is determined by three properties of its cash flows: (1) The *size* of the expected future cash flows is important—bigger is better. (2) The *timing* of cash flows counts—cash received sooner is more valuable than cash that comes later. (3) The *risk* of the cash flows matters—safer cash flows are worth more than uncertain cash flows. Therefore, managers can increase their firm's value by increasing the size of the expected cash flows, by speeding up their receipt, and by reducing their risk.

The relevant cash flow is called **free cash flow (FCF)**, not because it is free, but because it is available (or free) for distribution to a company's investors, including creditors and stockholders. You will learn how to calculate free cash flows in Chapter 2, but for now you should know that free cash flow is:

$$\text{FCF} = \begin{matrix}\textbf{Sales}\\ \textbf{revenues}\end{matrix} - \begin{matrix}\textbf{Operating}\\ \textbf{costs}\end{matrix} - \begin{matrix}\textbf{Operating}\\ \textbf{taxes}\end{matrix} - \begin{matrix}\textbf{Required investments}\\ \textbf{in new operating capital}\end{matrix}$$

A company's value depends on its ability to generate free cash flows, but a company must spend money to make money. For example, cash must be spent on R&D, marketing research, land, buildings, equipment, employee training, and many other activities before the subsequent cash flows become positive. Where do companies get this cash? For start-ups, it comes directly from investors. For mature companies, some of it comes directly from new investors, and some comes indirectly from current shareholders when profit is reinvested rather than paid out as dividends. As stated previously, these cash providers expect a rate of return to compensate them for the timing and risk inherent in their claims on future cash flows. This rate of return from an investor's perspective is a cost from the company's point of view. Therefore, the rate of return required by investors is called the **weighted average cost of capital (WACC)**.

The following equation defines the relationship between a firm's value, its free cash flows, and its cost of capital:

$$\text{Value} = \frac{\text{FCF}_1}{(1 + \text{WACC})^1} + \frac{\text{FCF}_2}{(1 + \text{WACC})^2} + \frac{\text{FCF}_3}{(1 + \text{WACC})^3} + \cdots + \frac{\text{FCF}_\infty}{(1 + \text{WACC})^\infty} \quad \textbf{(1-1)}$$

We will explain how to use this equation in later chapters, but for now it is enough to understand that a company's value is determined by the size, timing, and risk of its expected future free cash flows.

If the expected future free cash flows and the cost of capital incorporate all relevant information, then the value defined in Equation 1-1 is called the **intrinsic value**; it is also called the **fundamental value**. If investors have all the relevant information, the **market price**, which is the price that we observe in the financial markets, should be equal to the intrinsic value. Whether or not investors have the relevant information depends on the quality and transparency of financial reporting for the company and for the financial markets. This is an important issue that we will address throughout the book.

SELF-TEST

What are the key differences between proprietorships, partnerships, and corporations? Be sure to describe the advantages and disadvantages of each.

What are charters and bylaws?

Describe some special types of partnerships and corporations, and explain the differences among them.

What does it mean for a company to "go public" and "list" its stock?

What are some differences between the NYSE and the NASDAQ stock market?

What roles are played by an investment bank and its brokerage firm during an IPO?

What is IPO underpricing? Why is it often difficult for the average investor to take advantage of underpricing?

Differentiate between an IPO and a seasoned equity offering.

What three properties of future cash flows affect a corporation's value?

How is a firm's intrinsic (or fundamental) value related to its free cash flows and its cost of capital? Write out the free cash flow equation and explain what it means.

What is required for the market price to equal the fundamental value?

1-4 Governing a Corporation

For proprietorships, partnerships, and small corporations, the firm's owners determine strategy and manage day-to-day operations. This is usually not true for a large corporation, which often has many different shareholders who each own a small proportion of the total number of shares. These diffuse shareholders elect directors, who then hire senior executives, who then hire other managers to run the corporation on a day-to-day basis. These **insiders** are elected or hired to work on behalf of the shareholders, but what is to prevent them from acting in their own best interests? This is called an **agency problem** because managers are hired as agents to act on behalf of the owners. Agency problems can be addressed by a company's **corporate governance**, which is the set of rules that control the company's behavior toward its directors, managers, employees, shareholders, creditors, customers, competitors, and community. We will have much more to say about agency problems and corporate governance throughout the book, especially in Chapters 13, 14, and 15.

It is one thing to say that managers should act on behalf of owners, but how can managers put this into practice?

1-4a The Primary Objective of a Corporation: Maximizing Stockholder Wealth

A company's decisions matter to many different **stakeholders**, such as shareholders, employees, local communities, and others who are affected by the company's environmental impact. How should managers address and prioritize stakeholders' different concerns?

First, managers are entrusted with shareholders' property and should be good stewards of this property. Second, good stewardship implies that managers should seek to increase the entrusted property's value. In other words, the primary goal of the corporation should be to maximize stockholder wealth unless the company's charter states differently. This does *not* mean that managers should break laws or violate ethical considerations. This does *not*

mean that managers should be unmindful of employee welfare or community concerns. But it does mean that managers should seek to maximize stockholder wealth.

In fact, maximizing shareholder wealth is a fiduciary duty for most U.S. corporations. If companies fail in this duty, they can be sued by shareholders. For example, suppose several different companies make simultaneous offers to acquire a target company. The target's board of directors probably will be sued by shareholders if they don't vote in favor of the highest offer, even if the takeover means that the directors will lose their jobs. Companies can even be sued for maintaining social initiatives (such as purchasing environmentally friendly or locally sourced supplies at higher costs than equivalent imports) if shareholders believe they are too costly to the company.

The situation is different for many non-U.S. companies. For example, many European companies' boards have directors who specifically represent the interests of employees and not just shareholders. Many other international companies have government representatives on their boards or are even completely owned by a government. Such companies obviously represent interests other than shareholders.

In a recent development, some U.S. corporations are choosing a new corporate form called a **benefit corporation (B-corp)**, which expands directors' fiduciary responsibilities to include interests other than shareholders' interests (see the box "Be Nice with a B-Corp").

1-4b Intrinsic Stock Value Maximization and Social Welfare

If a firm attempts to maximize its intrinsic stock value, is this good or bad for society? In general, it is good. Aside from illegal actions such as making or taking bribes, fraudulent accounting, exploiting monopoly power, violating safety codes, or failing to meet environmental standards, *the same actions that maximize intrinsic stock values usually benefit society.*

Be Nice with a B-Corp

In 2010, Maryland became the first state to allow a company, The Big Bad Woof, to be chartered as a benefit corporation (B-corp). As of early 2015, there were more than 1,000 B-corps in 27 states, with legislation pending in 14 other states. B-corps are similar to regular for-profit corporations but have charters that include mandates to benefit the environment and society even if this might not maximize shareholder wealth. For example, The Big Bad Woof, which sells products for companion pets, seeks to purchase merchandise from small, local, minority-owned businesses even if their prices are a bit higher.

B-corps are required to report their progress in meeting the charters' objectives. Many self-report, but some choose to be certified by an independent third party, in much the same way that an independent accounting firm certifies a company's financial statements.

Why would a company become a B-corp? Patagonia founder Yvon Chouinard said, "Benefit corporation legislation creates the legal framework to enable mission-driven companies like Patagonia to stay mission-driven through succession, capital raises, and even changes in ownership, by institutionalizing the values, culture, processes, and high standards put in place by founding entrepreneurs."[a]

Does being a B-corp help or hurt a company's value? Advocates argue that customers will be more loyal and that employees will be prouder, more motivated, and more productive, which will lead to higher free cash flows and greater value. Critics counter that a B-corp will find it difficult to raise cash from additional investors because maximizing shareholder wealth isn't its only objective.

There isn't yet enough data to draw a conclusion, but it will be interesting to see whether B-corps ultimately produce a kinder, gentler form of capitalism.

Note: [a]See **www.patagonia.com/us/patagonia.go?assetid=68413**.

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The Federal Reserve Board conducts surveys of consumer finances every three years. For updates, go to **https://www.federalreserve.gov/econres/scfindex.htm**.

ORDINARY CITIZENS AND THE STOCK MARKET

About 52% of U.S. households own stock, either directly or indirectly through mutual funds or retirement plans. Therefore, when a manager takes actions to maximize intrinsic value, this increases wealth and quality of life for millions of citizens.

Note that about 48% of households *don't directly* benefit from higher stock prices. Even for the stock-owning households, most of the wealth accrues to the rich: (1) 1% of stock-owning households own about 39% of the wealth, (2) the next 9% own about 38%, and (3) the bottom 90% own about 23% (a substantial decrease from the bottom group's 33% share in 1989). If you ask someone whether wealth and income inequality are good or bad for our country, the answer probably depends on the person's political views.

EMPLOYEES AT VALUE-MAXIMIZING COMPANIES

Sometimes a company's stock price increases when it announces plans to lay off employees, but viewed over time, this is the exception rather than the rule. In general, companies that successfully increase stock prices also grow and add more employees, thus benefiting society. Note, too, that many governments across the world, including U.S. federal and state governments, are privatizing some of their state-owned activities by selling these operations to investors. Perhaps not surprisingly, the sales and cash flows of recently privatized companies generally improve. Moreover, studies show that newly privatized companies tend to grow and thus require more employees when they are managed with the goal of stock price maximization.

CONSUMERS AND COMPETITIVE MARKETS

Value maximization requires efficient, low-cost businesses that produce high-quality goods and services at the lowest possible cost. This means that companies must develop products and services that consumers want and need, which leads to new technology and new products. Also, companies that maximize their stock price must generate growth in sales by creating value for customers in the form of efficient and courteous service, adequate stocks of merchandise, and well-located business establishments. Therefore, consumers benefit in competitive markets when companies maximize intrinsic value.

1-4c Ethics and Intrinsic Stock Value Maximization

A firm's commitment to business ethics can be measured by the tendency of its employees, from the top down, to adhere to laws and regulations. But ethical behavior also includes a commitment to (1) appropriate use of confidential information (i.e., not for personal gain), (3) attention to product safety and quality, (3) fair employment practices, (4) fair marketing and selling practices, and (5) community involvement.

The intrinsic value of a company ultimately depends on all of its expected future cash flows, and making a substantive change requires hard work to increase sales, cut costs, or reduce capital requirements. There are very few, if any, *legal and ethical* shortcuts to making significant improvements in the stream of future cash flows, as illustrated by the following examples.

ILLEGAL ACTIONS

Unfortunately, managers at some companies have taken illegal actions to make intrinsic values seem much higher than warranted. For example, ForceField Energy Inc. claimed to be a wholesale distributor of efficient LED lighting products. However, its Chairman of the Board, Richard St. Julien, was arrested in 2015 on charges of security fraud.

Nine others, including brokers and fund managers, were charged in 2016 for taking kickbacks from ForceField in exchange for encouraging investors to purchase the stock even though they knew that the company was in dire financial straits. St. Julien pled guilty and cooperated with investigators in exchange for the possibility of a sentence of less than 40 years. As of mid-2018, five of the others have been sentenced to prison and four have pled guilty. The perpetrators are being punished, but that doesn't restore the $130 million lost by shareholders.

ALLEGED UNETHICAL ACTIONS

Other companies have been accused of unethical actions. For example, Mylan N.V. purchased exclusive rights in 2007 to sell EpiPens, which deliver a dose of epinephrine to reduce the impact of a sudden dangerous allergic reaction. Mylan subsequently increased the price 17 times from $100 per pair to $600 by May 2016. In late August 2016, Mylan was selling about $1 billion in EpiPens and its stock was trading close to $50 per share. However, the steep price increases had touched off outrage from parents and the news media. By fall of 2017, Mylan's stock price had fallen to about $32, a 36% decline. Part of that decline was due to (1) reputational damage, (2) lower revenues because Mylan introduced a generic version of the EpiPen (at $300 per pair), (3) a $467 million settlement with the Justice Department to resolve claims that Mylan had misclassified the EpiPen to avoid paying rebates to Medicaid, and (4) a still unresolved (as of early 2018) class action lawsuit alleging racketeering. As this example shows, even alleged unethical behavior can significantly reduce a company's value.

WHISTLEBLOWER PROTECTIONS

Most illegal or unethical schemes are difficult to hide completely from all other employees. But an employee who believes a company is not adhering to a law or regulation might be hesitant to report it for fear of being fired or otherwise punished by the company. To help address this problem, federal and state governments have created a variety of whistleblower protection programs corresponding to different types of corporate misdeeds.

With respect to financial misdeeds, the Sarbanes-Oxley (SOX) Act of 2002 and the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 strengthened protection for whistleblowers who report financial wrongdoing. Under SOX, employees who report corporate financial wrongdoing and subsequently are penalized by the company can ask the Occupational Safety and Health Administration (OSHA) to investigate the situation. If the employee was improperly penalized, the company can be required to reinstate the person, along with back pay and a sizable penalty award. In addition, SOX made it a criminal act for a CEO or CFO to knowingly falsely certify a company's financial position.

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For current information from OSHA, see **www.osha.gov/index.html** *and search for "whistleblower investigation data."*

Have these provisions in SOX been successful? There were 202 SOX-related employee complaints in 2017. Only 23% were settled in the employee's favor—the others were withdrawn, dismissed, or kicked out by OSHA. No executives have been jailed for falsely certifying financial statements, even though a significant number of executives have lost their jobs due to their companies' financial misreporting.

The Dodd-Frank Act's establishment of the SEC Office of the Whistleblower has led to dozens of announced awards for reporting wrongdoing by financial firms. In 2017, 13 whistleblowers received a total of $43 million, with one of them receiving $20 million. The awards can be very large because they are based on a percentage of the amount that the SEC fines the wrongdoing corporation. The largest award to an individual was $33 million in 2018.

Taxes and Whistleblowing

The Internal Revenue Service (IRS) has a program to reward whistleblowers for information leading to the recovery of unpaid taxes, and sometimes the rewards are huge. The largest reward was $104 million to Bradley C. Birkenfeld, who discovered schemes that UBS, a large Swiss bank, was using to help its clients avoid U.S. taxes. UBS settled with the U.S. Department of Justice in 2009 by paying $780 million in fines and providing account information for over 4,000 U.S. clients to the IRS. This caused thousands of additional U.S. taxpayers to fear similar exposure and to enter an IRS amnesty program, leading to over $5 billion in collections of unpaid taxes.

Despite the record-setting payout, Birkenfeld and the U.S. government do not have an amicable relationship. The government alleged that Birkenfeld learned about the UBS tax evasion schemes while using them to shelter one of his own clients from taxes. Birkenfeld refused to divulge information about this client during the investigation, so the United States convicted him of fraud. Birkenfeld served 30 months in a medium-security federal prison but still received the $104 million reward.

How much is freedom worth? About $115,000 per day, based on Birkenfeld's reward and prison time served.

Although not a substitute for high individual moral standards, it appears that large and visible rewards to whistleblowers help ethical employees rein in actions being considered by less ethical employees. This leads to less financial misreporting, which in turn helps keep market prices in line with intrinsic value.

SELF-TEST

What is an agency problem? What is corporate governance?

What is the fiduciary duty (i.e., the primary goal) for most U.S. corporations?

How does a benefit corporation's charter differ from that of a typical U.S. corporation?

Explain how individuals, customers, and employees can benefit when a company seeks to maximize its intrinsic value.

What is a whistleblower?

Compare the Sarbanes-Oxley (SOX) Act of 2002 and the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 with respect to their impact on whistleblowing.

1-5 An Overview of Financial Markets

At the risk of oversimplification, we can classify providers and users of cash into four groups: individuals, financial organizations (like banks and insurance companies), nonfinancial organizations (like Apple, Starbucks, and Ford), and governments. The following sections explain how these groups interact to allocate capital from providers to users.

WWW

For current information, see the Federal Reserve Bank of St. Louis's FRED® Economic Data. Take the total financial assets of households (and nonprofit organizations serving households), found at **https://fred.stlouisfed.org/series/TFAABSHNO**. *Then subtract the financial liabilities, found at* **https://fred.stlouisfed.org/series/TLBSHNO**.

1-5a The Net Providers and Users of Capital

In spite of William Shakespeare's advice, most individuals and firms are both borrowers and lenders. For example, an individual might borrow money by having a car loan but might also lend money by having a bank savings account. In the aggregate, however, *individuals are net providers (i.e., savers)* of most funds ultimately used by nonfinancial corporations. In fact, individuals provide a net amount of about $62 *trillion* to users.

Although most nonfinancial corporations own some financial securities, such as short-term Treasury bills, *nonfinancial corporations are net users (i.e., borrowers)* in the aggregate.

In the United States, federal, state, and local *governments are also net users (i.e., borrowers)* in the aggregate, although many foreign governments, such as those of China and oil-producing countries, are actually net providers.

Banks and other financial corporations raise money with one hand and invest it with the other. For example, a bank might raise money from individuals in the form of savings accounts and then lend most of that money to business customers. In the aggregate, *financial corporations are net users (i.e., borrowers)* by a slight amount.

1-5b Getting Cash from Providers to Users: The Capital Allocation Process

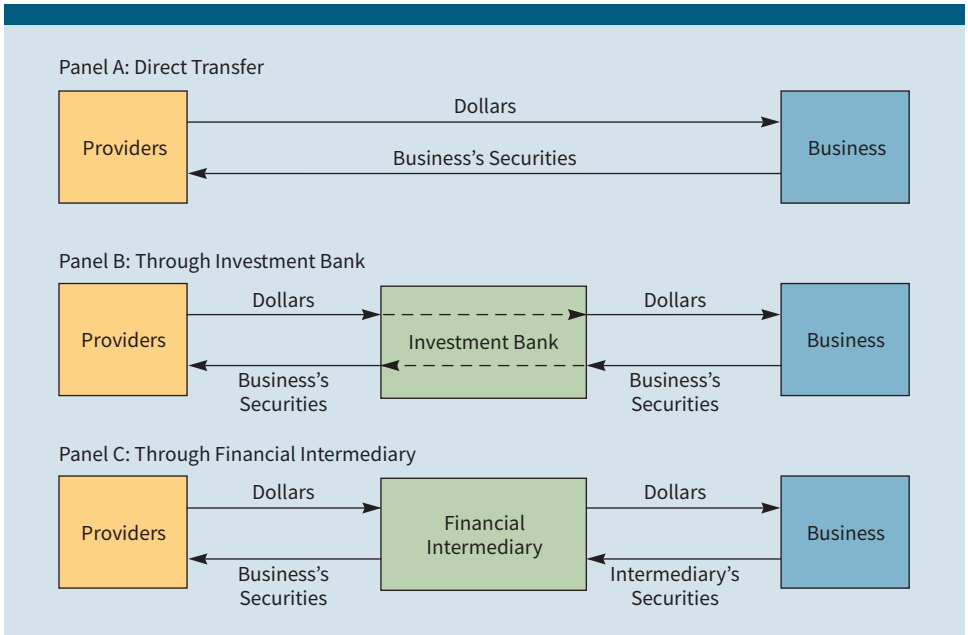
Because users invest the cash received from providers, it is called "capital." Transfers of capital from providers to users take place in three different ways. Direct transfers of money and securities, as shown in Panel A of Figure 1-2, occur when a business (or government) sells its securities directly to providers. Providers purchase the securities with cash and the business delivers the securities to the providers. For example, a privately held company might sell shares of stock directly to a new shareholder, or the U.S. government might sell a Treasury bond directly to an individual investor.

As shown in Panel B, indirect transfers may go through an investment bank, which *underwrites* the issue. An underwriter serves as a middleman and facilitates the issuance of securities. The company sells its stocks or bonds to the investment bank, which in turn sells these same securities to savers. Because new securities are involved and the corporation receives the proceeds of the sale, this is a "primary" market transaction.

Transfers also can be made through a **financial intermediary** such as a bank or mutual fund, as shown in Panel C. The intermediary obtains funds from providers in exchange for its own securities or ownership of savings accounts. The intermediary then uses this money to purchase the business's securities. For example, an individual might provide dollars to a bank and receive a certificate of deposit; the bank then might lend to a small business, receiving in exchange a legal document from the borrower promising to repay the loan. Thus, intermediaries literally create new types of securities.

There are three important features of the capital allocation process. First, new financial securities are created. Second, different types of financial institutions often act as intermediaries

FIGURE 1-2
Diagram of the Capital Allocation Process



between providers and users. Third, the activities occur in a variety of financial markets. The following sections describe each of these topics, beginning with financial securities.

SELF-TEST

What are the four major groups of providers and users? For each group, state whether it is a net provider or a net user.

Identify three ways that capital is transferred between savers and borrowers.

Distinguish between the roles played by investment banks and financial intermediaries in exchanging cash now for claims on future cash.

1-6 Claims on Future Cash Flows: Types of Financial Securities

Any claim on a future cash flow is called a **financial instrument**. Providers exchange cash for a financial instrument only if they expect an acceptable rate of return. We begin with an overview of financial instruments and then discuss expected returns.

1-6a Type of Claim on Future Cash Flows: Debt and Equity

A **financial security** is a claim that is standardized and regulated by the government (the legal definition is a bit longer). The variety of financial securities is limited only by human creativity, ingenuity, and governmental regulations. At the risk of oversimplification, we can classify most financial securities by the type of claim and the time until maturity.

DEBT

Financial securities are simply documents with contractual provisions that entitle their owners to specific rights and claims on specific cash flows or values. Debt instruments typically have specified payments and a specified maturity. For example, an Alcoa bond might promise to pay $30 semiannually for 30 years, at which time it promises to make a $1,000 principal payment.

If debt matures in more than a year, it is called a *capital market security*. Thus, the Alcoa bond in this example is a capital market security. If the debt matures in less than a year, it is a *money market security*. For example, Google might expect to receive $200,000 in 75 days, but it needs cash now. Google might issue commercial paper, which is essentially an IOU. In this example, Google might agree to pay $200,000 in 75 days in exchange for $199,200 today. Thus, commercial paper is a money market security.

EQUITY

Equity instruments are a claim upon a residual value. For example, Alcoa's stockholders are entitled to the cash flows generated by Alcoa after its bondholders, creditors, and other claimants have been satisfied. Because stock has no maturity date, it is a capital market security.

RATES AND MATURITY OF CLAIMS

Table 1-1 provides a summary of the major types of financial instruments, including risk, original maturity, and rate of return. Three rates of return are especially important. First, the **prime rate** is the rate U.S. banks charge to their most creditworthy customers. Second, **LIBOR** (London Interbank Offered Rate) is the rate that U.K. banks report for loans made to other U.K. banks. Third, the **Secured Overnight Financing**

Rate (SOFR) was introduced by the U.S. Federal Reserve and began trading on April 2, 2018. The SOFR is based on actual overnight loans that use Treasury securities as collateral. The first two rates are important because many financial instruments have returns based on these rates. For example, the rate on a loan might be specified as LIBOR + 2%. Although many loans are tied to LIBOR, the U.K. authority responsible for regulating LIBOR announced in 2016 that it would cease to regulate LIBOR at the end of 2021. As a potential replacement, the U.S. Federal Reserve created the third rate, SOFR, which the Fed began publishing in April, 2018.[5]

TABLE 1-1
Summary of Major Financial Instruments

Instrument	Major Participants	Risk	Original Maturity	Rates of Return on April 4, 2018
U.S. Treasury bills	Sold by U.S. Treasury	Default-free	91 days to 1 year	1.68%
Commercial paper	Issued by financially secure firms to large investors	Low default risk	Up to 270 days	1.90%
Money market mutual funds	Invested in short-term debt; held by individuals and businesses	Low degree of risk	No specific maturity (instant liquidity)	1.72%
Commercial loans	Loans by banks to corporations	Depends on borrower	Up to 7 years	Tied to prime rate (4.75%) or LIBOR (2.31%)
U.S. Treasury notes and bonds	Issued by U.S. government	No default risk, but price falls if interest rates rise	2 to 30 years	2.30% to 3.07%
Mortgages	Loans secured by property	Risk is variable	Up to 30 years	4.4%
Municipal bonds	Issued by state and local governments to individuals and institutions	Riskier than U.S. government bonds, but exempt from most taxes	Up to 30 years	3.01%
Corporate bonds	Issued by corporations to individuals and institutions	Riskier than U.S. government debt; depends on strength of issuer	Up to 40 years (although a few go up to 100 years)	4.64%
Preferred stocks	Issued by corporations to individuals and institutions	Riskier than corporate bonds	Unlimited	4% to 9%
Common stocks	Issued by corporations to individuals and institutions	Riskier than preferred stocks	Unlimited	8% to 15%

Notes:

1. Data for the prime rate and U.S. Treasury bills, notes, and bonds are from the *Federal Reserve Statistical Release* (**www.federalreserve.gov/releases/H15/update**).
2. Data for LIBOR, mortgages, and corporate bonds are from the Federal Reserve Bank of St. Louis's FRED® Economic Data (**https://fred.stlouisfed.org/series/USD3MTD156N**, **https://fred.stlouisfed.org/series/MORTGAGE30US**, and **https://fred.stlouisfed.org/series/BAA**).
3. Data for money market mutual funds are from Vanguard: **https://personal.vanguard.com/us/funds/snapshot?FundIntExt=INT&FundId=0030&funds_disable_redirect=true**.
4. Data for municipal bonds are from Bloomberg at **www.bloomberg.com/markets/rates-bonds/government-bonds/us**.
5. Common stocks are expected to provide a "return" in the form of dividends and capital gains rather than interest. Of course, if you buy a stock, your *actual* return may be considerably higher or lower than your *expected* return.

[5]There are two related reasons for the demise of LIBOR. First, it is the average of *reported* rates rather than *actual* rates. Second, there were several scandals involving manipulation of the reported rate by U.K. banks. This is why the Fed began publishing SOFR. The transition from LIBOR to SOFR will be gradual, but futures contracts on SOFR began trading on the Chicago Mercantile Exchange not long after the Fed began publishing SOFR rates. We expect rates on most financial securities will be tied to SOFR before 2022.

1-6b Type of Claim on Future Cash Flows: Derivatives and Hybrids

resource

*For an overview of derivatives, see **Web Extension 1A** on the textbook's Web site.*

Debt and equity represent claims upon the cash flows generated by real assets, such as the cash flows generated by Alcoa's factories and operations. In contrast, **derivatives** are securities whose values depend on, or are *derived* from, the values of some other traded assets. For example, an option on Alcoa stock and a futures contract to buy wheat are derivatives. We discuss options in Chapter 8 and in ***Web Extension 1A***, which provides a brief overview of options and other derivatives.

Some securities are a mix of debt, equity, and derivatives. For example, preferred stock has some features like debt and some like equity, while convertible debt has both debt-like and option-like features. We discuss hybrids in subsequent chapters.

1-6c Type of Claim on Future Cash Flows: Securitized Financial Assets

Some securities are created from packages of other financial assets, a process called **securitization**. The misuse of securitized assets is one of the primary causes of the most recent global financial crisis, so every manager needs to understand the process of securitization.

The details vary for different asset classes, but the processes are similar. For example, a bank might loan money to an individual who purchases a car. The individual signs a loan contract, which entitles the bank to receive future payments from the borrower. The bank can put a large number of these individual contracts into a portfolio (called a *pool*) and transfer the pool into a trust (a separate legal entity). The trust then creates new financial instruments that pay out a prescribed set of cash flows from the pool. The trust registers these new securities and sells them. The bank receives the proceeds from the sale, and the purchasers receive a new financial security that has a claim on the cash flows generated by the pool of auto loans.

Consider the benefits. First, because the bank received cash when it sold the securitized car loans, the bank now has replenished its supply of lendable funds and can make additional loans. Second, the bank no longer bears the risk of the borrowers defaulting. Instead, the securities' purchasers choose to bear that risk in expectation of earning an appropriate return. Third, the purchaser of a security has greater liquidity than the bank had when it owned the loan contract because there is an active secondary market for the securities.

Almost any class of financial assets can be securitized, including car loans, student loans, credit card debt, and home mortgages. We have more to say about securitized mortgages and the Great Recession of 2007 later in this chapter, but first let's take a look at the cost of money.

SELF-TEST

What is a financial instrument? What is a financial security?

What are some differences among the following types of securities: debt, equity, and derivatives?

Describe the process of securitization.

1-7 Claims on Future Cash Flows: The Required Rate of Return (the Cost of Money)

Providers of cash expect more cash back in the future than they originally supply to users. In other words, providers expect a positive rate of return on their investment. We call this a **required rate of return** because the prospect of more money in the future is *required* to

induce an investor to give up money today. Keep in mind that an investor's rate of return is a user's cost. For debt, we call this cost the **interest rate**. For equity, we call it the **cost of equity**, which consists of the dividends and capital gains stockholders expect. Therefore, the required rate of return is also called the *cost of money* or the *price of money*.

Notice in Table 1-1 that a financial instrument's rate of return generally increases as its maturity and risk increase. We will have much more to say about the relationships among an individual security's features, risk, and required rate of return later in the book, but first we will examine some fundamental factors and economic conditions that affect all financial instruments.

1-7a Fundamental Factors That Affect the Required Rate of Return (the Cost of Money)

The four most fundamental factors affecting the supply and demand of capital and the resulting cost of money are: (1) production opportunities, (2) time preferences for consumption, (3) risk, and (4) inflation.

PRODUCTION OPPORTUNITIES

Production opportunities are activities that require cash now but have the potential to generate cash in the future. For example, a company might sell stock to build a new factory, or a student might borrow to attend college. In both cases, there are prospects of future cash flows: The company might increase sales, and the new graduate might get a high-paying job. Notice that the size and likelihood of the future cash flows put an upper limit on the amount that can be repaid. All else held equal, improvements in production opportunities will increase this upper limit and create more demand for cash now, which will lead to higher interest rates and required returns.

TIME PREFERENCE FOR CONSUMPTION

Providers can use their current funds for consumption or saving. By saving, they choose not to consume now, expecting to consume more in the future. If providers strongly prefer consumption now, then it takes high interest rates to induce them to trade current consumption for future consumption. Therefore, the time preference for consumption has a major impact on the cost of money. Notice that the time preference for consumption varies for different individuals, for different age groups, and for different cultures. For example, people in Japan have a lower time preference for consumption than those in the United States, which partially explains why Japanese families tend to save more than U.S. families even though interest rates are lower in Japan.

RISK

If an opportunity's future cash flows are very uncertain and might be much lower than expected, providers require a higher expected return to induce them to take the extra risk.

EXPECTED INFLATION

Suppose you just paid $100 for a pair of running shoes that will last a year. If inflation is 3%, then a new pair of running shoes next year will cost $103, assuming shoe prices go up at the same rate as inflation. If you could invest $100 today at 5%, then you would have $105 next year from your investment, could buy new shoes for $103, and still have $2 left for other uses. Notice that part of your $5 return was "used up" by inflation: You will pay $103 for shoes next year instead of today's price of $100, so $3 out of your $5 return simply

covered inflation. In terms of additional purchasing power, you gained only $2 from your $100 investment. Therefore, $2 is your real increase in purchasing power, and 2% is your **real rate of return (r_r)** in terms of purchasing power.[6] The 5% return on your investment is called the **nominal rate of return (r_n)** because it is the stated rate shown at the time you make your investment. We will have much more to say about inflation in later chapters, but for now it is enough to understand that if expected inflation goes up, then the nominal interest rate also must go up to maintain the real interest rate.

1-7b Economic Conditions and Policies That Affect the Required Rate of Return (the Cost of Money)

Economic conditions and policies also affect required rates of return. These include: (1) Federal Reserve policy, (2) the federal budget deficit or surplus, (3) the level of business activity, and (4) international factors.

FEDERAL RESERVE POLICY

WWW

The home page for the Board of Governors of the Federal Reserve System can be found at **www.federalreserve.gov**. *You can access general information about the Federal Reserve, including press releases, speeches, and monetary policy.*

If the Federal Reserve Board wants to stimulate the economy, it most often uses open market operations to purchase Treasury securities held by banks. Because banks are selling some of their securities, the banks will have more cash, which increases their supply of loanable funds, which in turn makes banks willing to lend more money at lower interest rates. In addition, the Fed's purchases represent an increase in the demand for Treasury securities. As with anything for sale, increased demand causes Treasury securities' prices to go up and interest rates to go down. The net result is a reduction in interest rates, which stimulates the economy by making it less costly for companies to borrow for new projects or for individuals to borrow for major purchases or other expenditures.

Unfortunately, there is a downside to stimulation by the Fed. When banks sell their holdings of Treasury securities to the Fed, the banks' reserves go up, which increases the money supply. A larger money supply ultimately leads to an increase in expected inflation, which eventually pushes interest rates up. Thus, the Fed can stimulate the economy in the short term by driving down interest rates and increasing the money supply, but this creates longer-term inflationary pressures. This was exactly the dilemma facing the Fed in mid-2018.

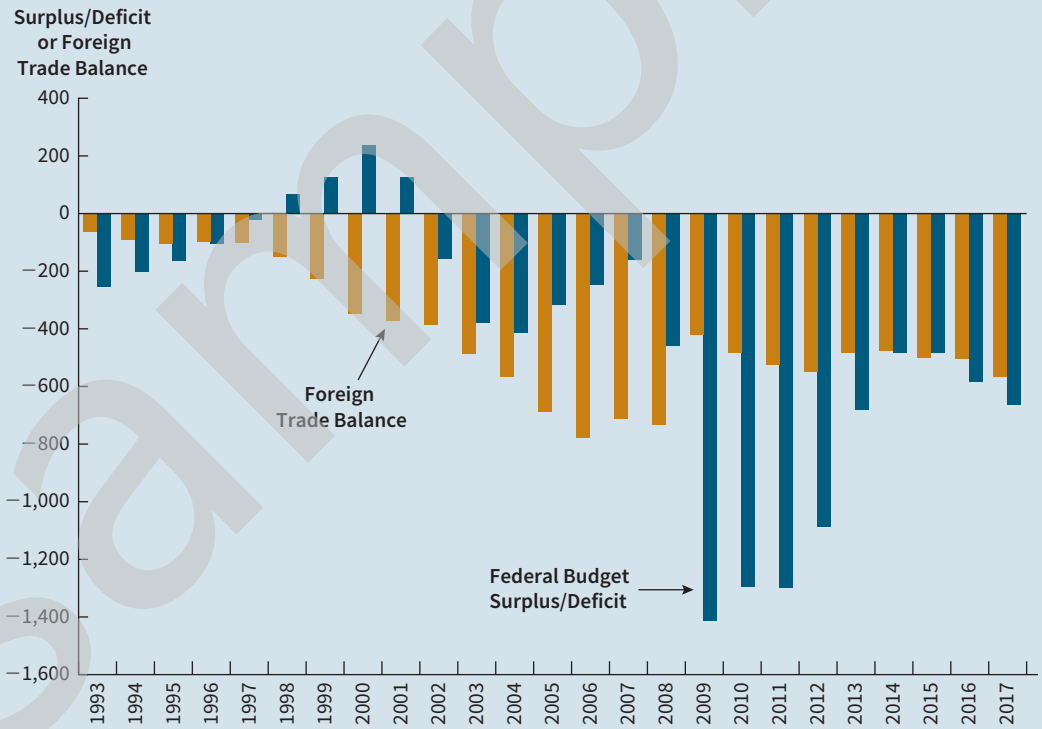
On the other hand, if the Fed wishes to slow down the economy and reduce inflation, the Fed reverses the process. Instead of purchasing Treasury securities, the Fed sells Treasury securities to banks, which reduces banking reserves and causes an increase in short-term interest rates but a decrease in long-term inflationary pressures.

FEDERAL BUDGET DEFICITS OR SURPLUSES

If the federal government spends more than it takes in from tax revenues, then it runs a deficit, and that deficit must be covered either by borrowing or by printing money (increasing the money supply). The government borrows by issuing new Treasury securities. All else held equal, this creates a greater supply of Treasury securities, which leads to lower security prices and higher interest rates. Federal government actions that increase the money supply also increase expectations for future inflation, which drives up

[6]The real rate of return is actually found by solving this equation: $(1.05) = (1.03)(1 + r_r)$. With a little algebra, $r_r = (1.05)/(1.03) - 1 = 0.0194 = 1.94\%$. For illustrative purposes, we approximated the calculation as $5\% - 3\% = 2\%$.

FIGURE 1-3
Federal Budget Surplus/Deficits and Foreign Trade Balances (Billions of Dollars)



Sources: The raw data are from the Federal Reserve Bank of St. Louis's FRED® Economic Data for fiscal years: **http://research.stlouisfed.org/fred2/series/FYFSD** and **http://research.stlouisfed.org/fred2/series/BOPGSTB?cid=125**.

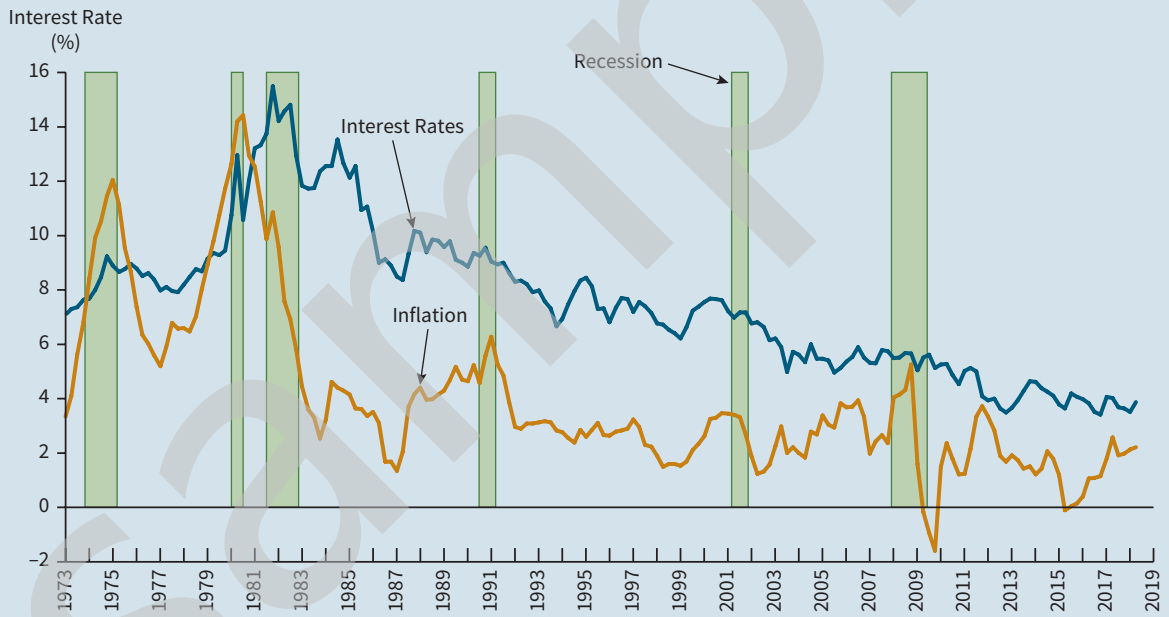
interest rates. Thus, the larger the federal deficit, other things held constant, the higher the level of interest rates. As shown in Figure 1-3, the federal government has run deficits in 20 of the past 24 years. Annual deficits in the mid-1990s were in the $250 billion range, but they ballooned to well over a trillion dollars in the past recession and are now about $585 billion.

LEVEL OF BUSINESS ACTIVITY

Figure 1-4 shows interest rates, inflation, and recessions. First, notice that interest rates and inflation are presently (late 2017) very low relative to the past 40 years. However, you should never assume that the future will be like the recent past!

Second, notice that interest rates and inflation typically rise prior to a recession and fall afterward. There are several reasons for this pattern. Consumer demand slows during a recession, keeping companies from increasing prices, which reduces price inflation. Companies also cut back on hiring, which reduces wage inflation. Less disposable income causes consumers to reduce their purchases of homes and automobiles, reducing consumer demand for loans. Companies reduce investments in new operations, which reduces their demand for funds. The cumulative effect is downward pressure on inflation and interest rates. The Federal Reserve is also active during recessions, trying to stimulate the economy by driving down interest rates.

FIGURE 1-4
Business Activity, Interest Rates, and Inflation



Notes:

1. Tick marks represent January 1 of the year.
2. The shaded areas designate business recessions as defined by the National Bureau of Economic Research; see **www.nber.org/cycles**.
3. Interest rates are for AAA corporate bonds; the source is: Moody's, Moody's Seasoned Aaa Corporate Bond Yield [AAA], retrieved from FRED, Federal Reserve Bank of St. Louis; **https://fred.stlouisfed.org/series/AAA**, April 8, 2018. These rates reflect the average rate during the quarter ending on the date shown.
4. Inflation is measured by the annual rate of change for the Consumer Price Index (CPI) for the preceding 12 months; the source is U.S. Bureau of Labor Statistics, Consumer Price Index for All Urban Consumers: All Items [CPIAUCSL], retrieved from FRED, Federal Reserve Bank of St. Louis; **https://fred.stlouisfed.org/series/CPIAUCSL**, April 8, 2018.

FOREIGN TRADE BALANCE: DEFICITS OR SURPLUSES

Businesses and individuals in the United States buy from and sell to people and firms in other countries. The **foreign trade balance** describes the level of imports relative to exports. If we buy more than we sell (that is, if we import more than we export), we are said to be running a *foreign trade deficit.* When trade deficits occur, they must be financed, and the main source of financing is debt. In other words, if we import $200 billion of goods but export only $90 billion, we run a trade deficit of $110 billion. That $110 billion in the hands of foreign companies won't just sit there as currency. It will be invested, frequently in U.S. Treasury securities, which means those dollars are lent back to the U.S. government. That is, we will probably borrow the $110 billion.[7] Therefore, the larger our trade deficit, the more we must borrow, and the increased borrowing drives up interest rates. Also, international investors are willing to hold U.S. debt only if the risk-adjusted rate paid on this debt is competitive with interest rates in other countries. Therefore, if the Federal

[7]The foreign trade deficit could also be financed by selling assets, including gold, corporate stocks, entire companies, and real estate. The United States has financed its massive trade deficits through all of these means in recent years, but the primary method has been by borrowing from foreigners.

Reserve attempts to lower interest rates in the United States, causing our rates to fall below rates abroad (after adjustments for expected changes in the exchange rate), then international investors will sell U.S. bonds, which will depress bond prices and result in higher U.S. rates. Thus, if the trade deficit is large relative to the size of the overall economy, it will hinder the Fed's ability to reduce interest rates and combat a recession.

WWW

If it won't depress you too much, you can see the current value of the national debt at **http://treasurydirect.gov/NP/debt/current**.

The United States has been running annual trade deficits since the mid-1970s; see Figure 1-3 for recent years. The cumulative effect of trade deficits and budget deficits is that the United States has become the largest debtor nation of all time. In fact, the federal debt exceeds *$21 trillion*! As a result, our interest rates are influenced by interest rates in other countries around the world. Some of the factors that affect foreign interest rates are international changes in tax rates, regulations, currency conversion laws, and currency exchange rates. Foreign investments also include the risk that property will be expropriated by the host government. We discuss these issues in Chapter 17.

Recall that financial markets connect providers and users: Providers supply cash now in exchange for claims on risky future cash. The next section describes financial institutions connect providers and users.

SELF-TEST

What is a "required rate of return"? Why is it called the "cost of money" or the "price of money"?

What is debt's cost of money called?

What two components make up the cost of money for equity?

What four fundamental factors affect required rates of return (i.e., the cost of money)?

How does Federal Reserve policy affect interest rates now and in the future?

What is a federal budget deficit or surplus? How does this affect interest rates?

What is a foreign trade deficit or surplus? How does this affect interest rates?

1-8 The Functions of Financial Institutions

Direct transfers of funds from individuals to businesses are relatively uncommon in developed economies. Instead, businesses usually find it more efficient to enlist the services of one or more financial institutions to raise capital. Most financial institutions don't compete in a single line of business but instead provide a wide variety of services and products, both domestically and globally. The following sections describe the major types of financial institutions and services, but keep in mind that the dividing lines among them are often blurred.

1-8a Investment Banks and Brokerage Activities

Investment banks help companies raise capital. Such organizations underwrite security offerings, which means they (1) advise corporations regarding the design and pricing of new securities, (2) buy these securities from the issuing corporation, and (3) resell them to investors. Although the securities are sold twice, this process is really one primary market transaction, with the investment banker acting as a facilitator to help transfer capital from savers to businesses. An investment bank often is a division or subsidiary of a larger company. For example, JPMorgan Chase & Co. is a very large financial services firm, with over $2.6 trillion in managed assets. One of its holdings is J.P. Morgan, an investment bank.

In addition to security offerings, investment banks also provide consulting and advisory services, such as merger and acquisition (M&A) analysis and investment management for wealthy individuals.

Most investment banks also provide brokerage services for institutions and individuals (called "retail" customers). For example, Merrill Lynch (acquired in 2008 by Bank of America) has a large retail brokerage operation that provides advice and executes trades for its individual clients. Similarly, J.P. Morgan helps execute trades for institutional customers, such as pension funds.

At one time, most investment banks were partnerships, with income generated primarily by fees from their underwriting, M&A consulting, asset management, and brokering activities. When business was good, investment banks generated high fees and paid big bonuses to their partners. When times were tough, investment banks paid no bonuses and often fired employees. In the 1990s, however, most large investment banks were reorganized into publicly traded corporations (or were acquired and then operated as subsidiaries of public companies). For example, in 1994 Lehman Brothers sold some of its own shares of stock to the public via an IPO. Like most corporations, Lehman Brothers was financed by a combination of equity and debt.

A relaxation of regulations in the 2000s allowed investment banks to undertake much riskier activities than at any time since the Great Depression. The new regulations allowed investment banks to use an unprecedented amount of debt to finance their activities—Lehman used roughly $30 of debt for every dollar of equity. In addition to their fee-generating activities, most investment banks also began trading securities for their own accounts. In other words, they took the borrowed money and invested it in financial securities. If you are earning 12% on your investments while paying 8% on your borrowings, then the more money you borrow, the more profit you make. But if you are leveraged 30 to 1 and your investments decline in value by even 3.33%, your business will fail. This is exactly what happened to Bear Stearns, Lehman Brothers, and Merrill Lynch in the fall of 2008. In short, they borrowed money, used it to make risky investments, and then failed when the investments turned out to be worth less than the amount they owed. Note that it was not their traditional investment banking activities that caused the failure, but the fact that they borrowed so much and used those funds to speculate in the market.

1-8b Deposit-Taking Financial Intermediaries

Some financial institutions are **financial intermediaries** because they take deposits from savers and then lend most of the deposited money to borrowers. Following is a brief description of such intermediaries.

SAVINGS AND LOAN ASSOCIATIONS (S&Ls)

Savings and loan associations (S&Ls) accept deposits from many small savers and then lend this money to home buyers and consumers. **Mutual savings banks (MSBs)** are similar to S&Ls, but they operate primarily in the northeastern states. Today, most S&Ls and MSBs have been acquired by banks.

CREDIT UNIONS

Credit unions are cooperative associations whose members have a common bond, such as being employees of the same firm or living in the same geographic area. Members' savings are loaned only to other members, generally for auto purchases, home-improvement loans, and home mortgages. Credit unions are often the cheapest source of funds available to individual borrowers.

COMMERCIAL BANKS

Commercial banks raise funds from depositors and by issuing stock and bonds to investors. For example, someone might deposit money in a checking account. In return, that person can write checks, use a debit card, and even receive interest on the deposits. Those who buy the banks' stocks and bonds expect to receive dividends and interest payments. Unlike nonfinancial corporations, most commercial banks are highly leveraged in the sense that they owe much more to their depositors and creditors than they raised from stockholders. For example, a typical bank has about $90 of debt for every $10 of stockholders' equity. If the bank's assets are worth $100, we can calculate its equity capital by subtracting the $90 of liabilities from the $100 of assets: Equity capital = $100 − $90 = $10. But if the assets drop in value by 5% to $95, the equity drops to $5 = $95 − $90, a 50% decline.

Banks are vitally important for a well-functioning economy, and their highly leveraged positions make them risky. As a result, banks are more highly regulated than nonfinancial firms. Given the high risk, banks might have a hard time attracting and retaining deposits unless the deposits were insured, so the Federal Deposit Insurance Corporation (FDIC), which is backed by the U.S. government, insures up to $250,000 per depositor. As a result of the great recession of 2007, this insured amount was increased from $100,000 in 2008 to reassure depositors.

Without such insurance, if depositors believed that a bank was in trouble, they would rush to withdraw funds. This is called a "bank run," which is exactly what happened in the United States during the Great Depression of 1929, causing many bank failures and leading to the creation of the FDIC in an effort to prevent future bank runs. Not all countries have their own versions of the FDIC, so international bank runs are still possible. In fact, a bank run occurred in September 2008 at the U.K. bank Northern Rock, leading to its nationalization by the government.

Most banks are small and locally owned, but the largest banks are parts of giant financial services firms. For example, JPMorgan Chase Bank, commonly called Chase Bank, is owned by JPMorgan Chase & Co., and Citibank is owned by Citicorp.

1-8c Investment Funds

At some financial institutions, savers have an ownership interest in a pool of funds rather than owning a deposit account. Examples include mutual funds, hedge funds, and private equity funds.

MUTUAL FUNDS

Mutual funds are organizations that accept money from savers and then pool these funds to buy financial instruments. Most mutual funds belong to a larger company's family of funds. For example, Franklin Resources Inc. is a publicly traded company and manages over $400 billion in more than 200 different mutual funds. Such mutual fund providers achieve economies of scale in analyzing securities, managing portfolios, and buying/selling securities.

Different funds are designed to meet the objectives of different types of savers. Hence, there are bond funds for those who desire safety and stock funds for savers who are willing to accept risks in the hope of higher returns. There are literally thousands of different mutual funds with dozens of different purposes and styles. For example, the Franklin Equity Income fund invests in stocks with high dividends, whereas the Franklin Growth Opportunities fund invests in stock with high growth potential.

Passively managed funds hold a group of stocks in a particular category and then minimize expenses by rarely trading. **Index funds** are passive funds designed to replicate the returns on a particular market index, such as the S&P 500. **Actively managed funds** have higher fees but seek to invest in undervalued securities within a particular category, such as growth stocks.

Money market funds invest in short-term, low-risk securities, such as Treasury bills and commercial paper. Many of these funds offer interest-bearing checking accounts with rates that are greater than those offered by banks, so many people invest in money market funds as an alternative to depositing money in a bank. Note, though, that money market funds are not required to be insured and so are riskier than bank deposits.[8]

Most traditional mutual funds allow investors to redeem their share of the fund only at the close of business. A special type of mutual fund, the **exchange-traded fund (ETF)**, allows investors to sell their share at any time during normal trading hours. ETFs usually have very low management expenses and are rapidly gaining in popularity.

HEDGE FUNDS

Most **hedge funds** are private limited partnerships whose purpose is to raise money from investors and engage in a variety of investment activities. Unlike typical mutual funds, which can have thousands of investors, hedge funds are limited to institutional investors and a relatively small number of high-net-worth individuals. Because these investors are supposed to be sophisticated, hedge funds are much less regulated than mutual funds. Many hedge funds literally try to hedge their bets by forming portfolios of conventional securities and derivatives in such a way as to limit potential losses without sacrificing too much of potential gains. However, many other hedge funds don't hedge as much and instead chase larger but riskier potential returns.

PRIVATE EQUITY FUNDS

Private equity (PE) funds are similar to hedge funds but PE funds own stock (equity) in other companies and often control those companies, whereas hedge funds usually own many types of securities. In contrast to a mutual fund, which might own a small percentage of a publicly traded company's stock, a private equity fund typically purchases the entire company. Before the purchase, the stock may have been privately held or publicly traded. Either way, it is not traded in the public markets after the purchase so it is called "private equity." For example, Staples, Inc. traded on the NASDAQ Stock Market until Sycamore Partners purchased it in 2017 for about $6.9 billion.

The private equity funds' general partners usually sit on their companies' boards and guide their strategies with the goal of later selling the companies for a profit, often through an initial public offering. For example, in 2007 two large private equity firms (Clayton, Dubilier & Rice LLC and KKR & Co LP) jointly purchased U.S. Foodservice, a subsidiary of a publicly traded company (Royal Ahold N.V.). In 2016, the PE firms took the company public as US Foods Holding Corp. in an IPO by selling $1.02 billion in stock.

Most hedge funds and private equity funds belong to a larger company's family of funds. For example, The Blackstone Group manages funds with over $350 billion in assets and Apollo Global Management, LLC, has over $200 billion under management.

[8]The U.S. Treasury sold deposit insurance to eligible money market funds between September 2008 and September 2009 to help stabilize the markets during the height of the financial crisis.

1-8d Life Insurance Companies and Pension Funds

Life insurance companies take premiums, invest these funds in stocks, bonds, real estate, and mortgages, and then make payments to beneficiaries. Life insurance companies also offer a variety of tax-deferred savings plans designed to provide retirement benefits.

Traditional **pension funds** are retirement plans funded by corporations or government agencies. Pension funds invest primarily in bonds, stocks, mortgages, hedge funds, private equity, and real estate. Most companies now offer self-directed retirement plans, such as 401(k) plans, as an addition to or substitute for traditional pension plans. In traditional plans, the plan administrators determine how to invest the funds; in self-directed plans, all individual participants must decide how to invest their own funds. Many companies are switching from traditional plans to self-directed plans, partly because this shifts the risk from the company to the employee.

1-8e Regulation of Financial Institutions

In 1933, the **Glass-Steagall Act** was passed with the intent of preventing another great depression. In addition to creating the FDIC to insure bank deposits, the law imposed constraints on banking activities and separated investment banking from commercial banking. The regulatory environment of the post-Depression era included a prohibition on nationwide branch banking, restrictions on the types of assets the institutions could buy, ceilings on the interest rates they could pay, and limitations on the types of services they could provide. Arguing that these regulations impeded the free flow of capital and hurt the efficiency of our capital markets, policymakers took several steps from the 1970s to the 1990s to deregulate financial services companies, culminating with the Gramm–Leach–Bliley Act of 1999, which "repealed" Glass-Steagall's separation of commercial and investment banking.

One result of deregulation was the creation of huge **financial services corporations**, which own commercial banks, S&Ls, mortgage companies, investment-banking houses, insurance companies, pension plan operations, and mutual funds. Many are now global banks with branches and operations across the country and around the world.

WWW

For current bank rankings, go to Global Finance Magazine's Web site, **www.gfmag.com**, *and use the search for "biggest global banks."*

For example, Citigroup combined one of the world's largest commercial banks (Citibank), a huge insurance company (Travelers), and a major investment bank (Smith Barney), along with numerous other subsidiaries that operate throughout the world. Bank of America also made numerous acquisitions of many different financial companies, including Merrill Lynch, with its large brokerage and investment banking operations, and mortgage giant Countrywide Financial.

These conglomerate structures are similar to those of major institutions in China, Europe, Japan, and elsewhere around the globe. Though U.S. banks grew dramatically as a result of recent mergers, they are still relatively small by global standards. The world's largest bank is the Industrial and Commercial Bank of China. Among the world's ten largest world banks, based upon total assets, only one (JPMorgan Chase) is headquartered in the United States.

The great recession of 2007 and continuing global economic weakness caused regulators and financial institutions to rethink the wisdom of deregulating conglomerate financial services corporations. To address some of these concerns, the Dodd-Frank Wall Street Reform and Consumer Protection Act was passed in 2010. As we write this in 2018, Congress is undoing many of the Dodd-Frank's regulations, allowing financial institutions to take on more risk. We discuss Dodd-Frank and other regulatory changes in Section 1-12, where we explain the events leading up to the great recession of 2007.

SELF-TEST

What were the traditional roles of investment banks prior to the 1990s? What types of activities did investment banks add after that?

Describe the different types of deposit-taking institutions.

What are some similarities and differences among mutual funds, hedge funds, and private equity funds?

Describe a life insurance company's basic activities.

What are traditional pension funds? What are 401(k) plans?

1-9 Financial Markets

Financial markets serve to connect providers of funds with users for the purpose of exchanging cash now for claims on future cash (e.g., securities such as stocks or bonds). In addition, they provide a means for trading securities after they have been issued. We describe different types of markets and trading procedures in the following sections.

1-9a Types of Financial Markets

There are many different ways to classify financial markets, depending upon the types of instruments, customer, or geographic locations. You should recognize the big differences among types of markets, but keep in mind that the distinctions are often blurred.

PHYSICAL ASSETS VERSUS FINANCIAL ASSETS

Physical asset markets (also called "tangible" or "real" asset markets) are those for such products as wheat, autos, real estate, computers, and machinery. **Financial asset markets**, on the other hand, deal with stocks, bonds, notes, mortgages, derivatives, and other financial instruments.

TIME OF DELIVERY: SPOT VERSUS FUTURE

Spot markets are markets where assets are being bought or sold for "on-the-spot" delivery (literally, within a few days). **Futures markets** are for assets whose delivery is at some future date, such as 6 months or a year into the future.

MATURITY OF FINANCIAL ASSET: SHORT VERSUS LONG

Money markets are the markets for short-term, highly liquid debt securities, while **capital markets** are the markets for corporate stocks and debt maturing more than a year in the future. The New York Stock Exchange is an example of a capital market. When describing debt markets, "short term" generally means less than 1 year, "intermediate term" means 1 to 5 years, and "long term" means more than 5 years.

PURPOSE OF LOANS TO INDIVIDUALS: LONG-TERM ASSET PURCHASES VERSUS SHORTER-TERM SPENDING

Mortgage markets deal with loans on residential, agricultural, commercial, and industrial real estate, while **consumer credit markets** involve loans for autos, appliances, education, vacations, and so on.

PRIVATE VERSUS PUBLIC

Private markets are where transactions are worked out directly between two parties. The transactions are called **private placements**. For example, bank loans and private placements of debt with insurance companies are examples of private market transactions. Because these transactions are private, they may be structured in any manner that appeals to the two parties.

Public markets are where standardized contracts are traded on organized exchanges. Because securities that are traded in public markets (for example, common stock and futures contracts) are ultimately held by a large number of individuals, they must have fairly standardized contractual features.

Private market securities are more tailor-made but less liquid, whereas public market securities are more liquid but subject to greater standardization.

GEOGRAPHIC SCOPE

World, national, regional, and local markets also exist. Thus, depending on an organization's size and scope of operations, it may be able to borrow or lend all around the world, or it may be confined to a strictly local, even neighborhood, market.

PRIMARY MARKETS VERSUS SECONDARY MARKETS

Primary markets are the markets in which corporations raise new capital. For example, if a private company has an IPO or if a public company sells a new issue of common stock to raise capital, this would be a primary market transaction. The corporation selling the newly created stock receives the proceeds from such a transaction.

Secondary markets are markets in which existing, already outstanding securities are traded among investors. Thus, if you decided to buy 1,000 shares of Starbucks stock, the purchase would occur in the secondary market. Secondary markets exist for many financial securities, including stocks and bonds.

It is important to remember that the company whose securities are being traded is not involved in a secondary market transaction and thus does not receive any funds from such a sale. However, secondary markets are vital for a well-functioning economy because they provide liquidity and foster entrepreneurship.

1-9b Why Are Secondary Markets Important?

Secondary markets provide liquidity for investors who need cash or who wish to reallocate their investments to potentially more productive opportunities. For example, a parent who owns stock might wish to help pay for a child's college education. Or consider an investor who owns stock in a coal-mining company but who wishes to invest in a manufacturer of solar panels. Without active secondary markets, investors would be stuck with the securities they purchase.

Secondary markets also foster entrepreneurship. For example, it might take a very long time before an entrepreneur can use a start-up company's cash flow for personal spending because the cash flow is needed to support the company's growth. In other words, the company might be successful, but the entrepreneur feels "cash poor." However, if the company goes public, its stock can be traded in the secondary market. The entrepreneur then can sell some personal shares of stock and begin to enjoy the financial rewards of having started a successful company. Without this prospect, entrepreneurs have diminished incentives to start companies.

Secondary markets also provide a measure of value as perceived by buyers and sellers, making it easy to quickly compare different investments.

1-9c Trading Procedures in the Secondary Markets

A **trading venue** is a site (geographical or electronic) where secondary market trading occurs. Although there are many trading venues for a wide variety of securities, we classify their trading procedures along two dimensions: location and method of matching orders.

PHYSICAL LOCATION VERSUS ELECTRONIC NETWORK

In a **physical location exchange** traders actually meet and trade in a specific part of a specific building. For example, the New York Stock Exchange and the London Metals Exchange conduct some trading at physical locations.

In contrast, traders do not physically meet in a **computer/telephone network**. For example, the markets for U.S. Treasury bonds and foreign exchange primarily operate via telephone and/or computer networks. Most stock markets, including the NASDAQ Stock Market, do not have face-to-face trading.

MATCHING ORDERS: OPEN OUTCRY AUCTIONS, DEALER MARKETS, AND AUTOMATED TRADING PLATFORMS

The second dimension is the way orders from sellers and buyers are matched. This can occur in a face-to-face open outcry auction, through dealers, or by automated matching engines.

Open Outcry Auctions An **open outcry auction** occurs when traders actually meet face-to-face and communicate with one another through shouts and hand signals. When a seller and buyer agree on the price and quantity, the transaction is finalized and reported to the organization that manages the auction.

Dealer Markets and Market Makers In a **dealer market**, there are *market makers* who keep an inventory of the stock (or other financial instrument) in much the same way that any merchant keeps an inventory of goods. These dealers list **bid quotes** and **ask quotes**, which are the prices at which they are willing to buy or sell. In a traditional dealer market, computerized quotation systems keep track of all bid and ask quotes, but they don't actually match buyers and sellers. Instead, traders must contact a specific dealer to complete the transaction.

Automated Trading Platforms with Automated Matching Engines An **automated matching engine** is part of a computer system in which buyers and sellers post their orders and then let the computer automatically determine whether a match exists. If a match exists, the computer automatically executes and reports the trade. The entire system is called an **automated trading platform**.

For example, suppose Trader B ("B" is for buyer) places an order to buy 500 shares of GE, but only if the sale occurs within the next hour and at a price of no more than $24.99 per share. The $24.99 is the **bid price** because the buyer is "bidding" $24.99 for a share of GE. The order itself is a **limit order** because the buyer specifies limits with respect to the order's price and duration. The computer will put the information into its **order book**, which is a record of all outstanding orders. Suppose all other bid prices in the order book are less than $24.99. When the computer ranks bids in the order book *from high to low,* Trader B's $24.99 bid will be at the top of the book. In other words, it is the highest bid price of any orders in the book, which is the most anyone currently is willing to pay for GE.

Now suppose Trader S ("S" is for seller) places a limit order to sell 500 shares of GE at a price of at least $25.15. The $25.15 is the **ask price** because the seller is asking for $25.15 per share. Let's suppose that all other ask prices in the computer's order book are greater than $25.15. When the computer ranks ask prices *from low to high*, Trader S's $25.15 ask price will be at the top of the book because it is the *lowest* ask price of any orders in the book. In other words, it is the lowest at which anyone is willing to sell GE.

In this situation, the computer won't find a match—all sellers want at least $25.15, but no buyers will pay more than $24.99. No transactions will occur until sellers reduce their ask prices or buyers increase their bids. The difference between the ask price and the bid price is called the **bid-ask spread**. In this example, it is:

$$\text{Bid-ask spread} = \text{Ask price} - \text{Bid price} = \$25.15 - \$24.99 = \$0.16$$

The order book is updated each time a new order arrives or a limit order expires. New orders arrive frequently, and many times there will be a match.

For example, suppose Trader S worries that prices will fall and would rather sell at $24.99 than wait and hope that prices will come up to the original ask price of $25.15. In this case, Trader S would send in an order to sell at the market price—this is called a **market order** because it asks to transact at the current market price. In this case, the computer would automatically match Trader S and Trader B, execute the trade of 500 shares of GE at $24.99, and notify both participants that the trade has occurred.[9]

Automated trading systems are rapidly replacing face-to-face trading in the secondary stock markets, as we describe in the next section.

SELF-TEST

What is the basic function of a financial market?

Distinguish between (1) physical asset markets and financial asset markets, (2) spot and futures markets, (3) money and capital markets, (4) mortgage and consumer credit markets, (5) private and public markets, and (6) primary and secondary markets.

List three reasons why secondary markets are important.

What is a trading venue?

What are the major differences between physical location exchanges and computer/telephone networks?

What are the differences among open outcry auctions, dealer markets, and automated trading platforms with automated matching engines?

What is a limit order? What is an order book? What is a market order?

1-10 Overview of the U.S. Stock Markets

Because stock markets are so large and important, all managers should have a basic understanding of what the stock markets are and how they function. Before 1970, there was just one major U.S. stock exchange, the NYSE, where the vast majority of stocks were listed and traded. Today, however, the situation is much more fragmented for both listing and trading.

Recall that a publicly traded company first registers with the SEC, applies to be listed at a stock exchange, and then has an IPO, after which its stock can be traded in public

[9]Most exchanges have 10 or more types in addition to limit orders and market orders.

TABLE 1-2
Stock Exchange Listings and Total Market Value

Exchange	Number of Listings	Market Value of Listings (Trillions)
NYSE	3,131	$27.9
NASDAQ	3,274	11.3
NYSE MKT	362	0.2
	6,767	$39.4

Source: The NASDAQ Web site provides data for individual companies on these exchanges. The data may be downloaded from the NASDAQ Company List at **www.nasdaq.com/screening/company-list.aspx**. The individual stock data are summarized in this table. The data are for September 12, 2017.

Notes:

These include listings by foreign companies on U.S. exchanges in addition to listings by U.S. companies. In fact, over 35% of the listings are by foreign companies; for the number of U.S. companies on these exchanges, see the World Bank at **https://data.worldbank.org/indicator/CM.MKT.LDOM.NO?locations=US**.

markets. A company can list its stock only at a single SEC-registered stock exchange. In 2017, there were about a dozen active registered exchanges for trading stock, but most stocks were listed on just three—the NYSE, the NASDAQ Stock Market (NASDAQ), and the NYSE MKT (formerly called the American Stock Exchange).[10] As Table 1-2 shows, these three exchanges have almost 6,000 listings with a total value of around $34 *trillion*. NASDAQ has the most listings, but the NYSE's listings have a much bigger market value.

Over 9,000 companies were listed in 1997, about 3,000 fewer than today. Part of this decline is due to mergers in which two listings become one listing, but the primary reason is that private companies now have much more access to funding, especially from private equity funds.

Does it matter where a stock is listed? It certainly did before the year 2000, when the vast majority of a stock's secondary market trading occurred where it was listed. The two primary trading venues, the NYSE and NASDAQ, had very different trading procedures: NYSE trading took place face-to-face at a physical location (on Wall Street) and NASDAQ trading was a dealer market with a computerized quotation system. The two exchanges also had very different reputations: Only relatively large companies could list at the NYSE, but smaller companies (many of them high-tech) could list at NASDAQ.

The situation today is very different. Although listings are still concentrated at the NYSE (owned by ICE) and NASDAQ (owned by NASDAQ OMX), a company's shares can and do trade at many different venues. In addition, very little stock trading is conducted face-to-face but is instead executed with automated trading platforms.

SELF-TEST

Which exchange has the most listed stocks? Which exchange's listed stocks have the greatest market value?

Are shares of a company's stocks traded only on the exchange where the stock is listed?

[10]NASDAQ originally stood for the National Association of Securities Dealers (NASD) Automated Quotation system. However, the NASD became part of the Financial Industry Regulatory Authority (FINRA) and is no longer affiliated with the automated quotation system even though it is still named NASDAQ.

1-11 Trading in the Modern Stock Markets[11]

The NYSE and NASDAQ no longer dominate stock market trading. This section explains how modern stock markets operate.

1-11a Reg NMS: Stock Transactions, Quotes, and the "Market Price"

If an exchange-listed stock is bought or sold at any trading venue, the transaction price and volume (i.e., the number of shares traded) must be reported to the consolidated tape system, which is a computer network.[12] The most recent trade is often called the "market price." Several free sources, including CNBC, report the most recent transaction price. In addition to reporting transactions, registered stock exchanges must also report certain information about limit order bid and ask quotes to a consolidated quote system, as we explain next.

We streamlined the previous example of an automated matching engine by showing quoted limit orders from only one order book. However, there is an order book for each stock at each exchange, and each order book might have different bid and ask prices. To help investors make informed decisions, the SEC adopted **Regulation National Market System (Reg NMS)** in 2005 and implemented it in 2007. Among its provisions, Reg NMS requires all registered stock exchanges to report their best (highest) bid price and best (lowest) ask price for each stock in their order books. After collecting this information from all the exchanges, a computer system identifies and reports the *overall* best bid and best ask. These best overall quotes are called the **National Best Bid and Offer (NBBO)**, which is the overall best (highest) bid price and best (lowest) ask price (the price at which an investor offers to sell stock). In other words, the NBBO represents the best prices at which an investor could buy or sell on any of the exchanges.

If an investor places a market order to buy or sell at the market price, Reg NMS's *order protection rule* requires trading venues to execute the trade at a price that is at least as good as the NBBO quotes. For example, suppose the NBBO quotes for Apple are a bid price of $179.98 and an ask (offer) price of $180.02. If an investor places a market order to sell shares of Apple, the investor must receive at least $179.98, the national best bid price. Or if an investor places a market order to buy Apple stock, the investor must pay no more than $180.02, the national best ask price. As this example illustrates, the NBBO quotes help determine the "market" price in a market order.

What if the investor wants to buy 500 shares of Apple at the market price, but the NBBO ask price of $180.02 is for only 100 shares? In this case, 100 shares might be transacted at the current NBBO price of $180.02, after which the computer systems will announce a new NBBO price, which might be for 100 shares at $180.07. The process would be repeated until the market order to buy 500 shares is completed.

Notice that the average price paid by the buyer might be higher than the original NBBO ask price if there were not enough shares offered for sale at the original NBBO ask price. Therefore, the NBBO is supposed to reflect market conditions, but it might not be very representative of the actual market supply and demand if the number of shares in the NBBO quote is very small. We will have more to say about this when we explain high-frequency trading, but let's first take a look at where stock is traded.

[11]The material in this section is relatively technical, and some instructors may choose to skip it.

[12]No tape is involved in the modern consolidated tape system, but the name comes from days in which trades were reported on a thin paper tape that spewed out of a ticker tape machine.

1-11b Where Is Stock Traded?

As mentioned previously, almost all trading occurred on the floor of the NYSE before 1970. Even as recently as 2005, almost 80% of trading in NYSE-listed stocks took place at the NYSE, primarily on the trading floor itself.[13] However, the markets today are very different, with trading taking place at dozens of different venues. Before tackling the different ways that trades are completed, let's take a look at how a trade begins.

HOW A STOCK TRADE BEGINS

Buyers and sellers must have brokerage accounts through which they place orders. These accounts can be with human stockbrokers (Merrill Lynch has over 15,000 brokers) or with computer systems (such as online trading accounts with TD Ameritrade). Either way, investors must pay to have their orders placed, executed, and recorded.

An investor chooses whether or not to place an order, but unless the investor specifies differently, the broker chooses *where* to send the order. This is called *order routing*, and it determines the trading venue. There are three types of trading venues, each differing with respect to the degree of SEC regulation and reporting requirements: (1) standard broker-dealer networks, (2) alternative trading systems, and (3) registered stock exchanges.

Because an investor initiates a trade by placing an order with a broker, we begin by describing broker-dealer networks.

STANDARD BROKER-DEALER NETWORKS

A **broker-dealer** is a broker that is also registered so that it can buy and sell for itself when it acts as a market maker. Broker-dealers can be individuals, companies, or subsidiaries of a larger financial services company. Broker-dealers and individual brokers must also follow state and industry licensing and registration requirements.

When broker-dealers execute trades among themselves, it is called an **off-exchange transaction** because the trades are not executed at a registered stock exchange. Instead, the trades take place within a **broker-dealer network** in which a broker-dealer trades on behalf of its clients or itself.[14] Many years ago, brokers actually would pass physical shares of stock over a counter to a buyer, in much the same way that a fast-food employee now hands a bag of burgers to a customer. Although counters are no longer involved, broker-dealer trades are still called **over-the-counter (OTC) trades**.[15]

About 21% of all stock market trading (based on dollar values) now takes place in broker-dealer networks, as shown in Table 1-3. Broker-dealer networks are less regulated than registered stock exchanges. For example, broker-dealers must report transactions

[13]See page 6 in the SEC's Concept Release on Equity Market Structure at **www.sec.gov/rules/concept/2010/34-61358.pdf**.

[14]Most large financial services firms have a subsidiary that acts as a broker-dealer network. Its clients usually are brokers in the financial services firm's other subsidiaries. The network also trades with other broker-dealer networks.

[15]Today the actual certificates for almost all listed stocks and bonds in the United States are stored in a vault, beneath Manhattan, that is operated by the Depository Trust and Clearing Corporation (DTCC). Most brokerage firms have an account with the DTCC, and most investors leave their stocks with their brokers. Thus, when stocks are sold, the DTCC simply adjusts the accounts of the brokerage firms that are involved, and no stock certificates are actually moved.

TABLE 1-3
Stock Trading Venues and Trading Activity

Owner of Trading Venue and Venues	Percentage of Dollar Volume	
Cboe Global Markets: BYX, BZX, EDGA, EDGX	18%	
NASDAQ OMX: NASDAQ[a], NASDAQ BX[b], NASDAQ PSX[c]	22%	
Intercontinental Exchange: NYSE[d], NYSE Arca[e], NYSE American[f]	22%	
Others	3%	
Total trading on all exchanges:		**65%**
Dark pools (ATS): 34	13%	
Broker-dealer networks: Over 250[g]		
Retail trades	8%	
Institutional trades	14%	
Total broker-dealer trades:	*22%*	
Total trading off-exchange:		**35%**

Sources: Data for exchanges are from Bats Global Markets: **http://markets.cboe.com/us/equities/market_share/market/**. The percentages for off-exchange trading are based on the proportions of off-exchange trading for ATSs and non-ATSs shown in an SEC report by Laura Tuttle, which can be found at **www.sec.gov/marketstructure/research/otc_trading_march_2014.pdf**.

Notes:

[a]About 18% trades at NASDAQ.

[b]This was formerly the Boston Stock Exchange.

[c]This was formerly the Philadelphia Stock Exchange.

[d]About 12% trades at NYSE.

[e]This was formerly the Archipelago electronic communications network.

[f]This was formerly the American Stock Exchange.

[g]About half the trades are executed by only seven broker-dealers.

(the price and number of shares) but are not required to report any information about limit orders that have not yet been filled.

Following is a description of how trading works in a broker-dealer network.

Trading in a Standard Broker-Dealer Network Suppose a broker-dealer receives a market order (buy or sell a certain number of shares in a particular company's stock at the market price) from one of its clients, from an independent broker, or from another broker-dealer. In many cases, a broker-dealer will attempt to fill the order in-house without sending it to a stock exchange. For example, Morgan Stanley & Co. LLC is a registered broker-dealer and sometimes facilitates trades for its clients by matching a sell order from one client with a buy order from another client. If no in-house match between clients is available with respect to the company or number of shares, a broker-dealer might act as a dealer and fill the order by selling from or buying for its own inventory. Alternatively, the original broker-dealer might send the order to a "wholesale" broker-dealer who will combine orders from many other broker-dealers and look for a match.

For example, suppose a broker-dealer has a market order to buy 100 shares of Apple and a market order to sell 100 shares of Apple. Recall from Section 1-11a that any transaction must be between the NBBO bid and ask price:

$$\text{NBBO bid} = \$179.98 \leq \text{Transaction price} \leq \$180.02 = \text{NBBO ask}$$

The broker-dealer can satisfy Reg NMS, provide better prices to clients, and still profit from the transaction. For example, the broker-dealer can buy 100 shares from the selling client at $179.99, which is better than the NBBO bid of $179.98. The selling client actually gets a higher price than the NBBO bid price.

The broker-dealer can then sell the just purchased 100 shares to the buying client at $180.01, which is better than the NBBO ask price of $180.02. Therefore, the buying client gets to purchase shares at a lower price than the NBBO ask price. This process is called **price improvement** because the clients get better deals than the posted NBBO quotes would indicate.

What about the broker-dealer's cash flows? The broker-dealer pays $179.99 per share and then immediately sells for $180.01, pocketing the difference of 2 cents per share: $180.01 − $179.99 = $0.02. This spread is the broker-dealer's compensation for executing the trades.[16]

This process is called **internalization** because the broker-dealer is actually the counterparty for both clients: The broker-dealer buys from one client and sells to the other. Over 200 broker-dealers participate in this network, but only a handful of wholesale broker-dealers actually execute the trades. Some experts estimate that broker-dealers internalize over 90% of all market orders but send almost all limit orders to trading venues outside their own networks.[17]

Retail and Institutional Clients in a Broker-Dealer Network Broker-dealers facilitate trading by individual investors (often called *retail trading*) and by institutional investors, such as pension funds. Institutions often trade larger quantities of stock than retail clients, which can create a problem.

For example, suppose a pension fund places an order to sell 10,000 shares of Google. (This is called a *block trade* because the quantity is at least 10,000.) A large order like this might create a big addition to the number of shares currently being offered for sale by others. This might create a temporary imbalance in supply and demand, causing the price to fall before the institution can sell all 10,000 shares. To avoid depressing the price, the institution might place many small orders rather than a single large order. Alternatively, the institution might engage the services of a broker-dealer to locate a large counterparty to buy the 10,000 shares. This counterparty might be another institution, or it might be another broker-dealer. In either case, this is called an "upstairs" trade even though no stairs are involved.[18]

Although broker-dealers must publicly report the price and number of shares for each transaction, they do not have to report the names of the traders, making it impossible to identify exactly how much trading is due to retail clients versus institutions. However, large trades of more than 500 shares comprise about 30% of all dealer-broker

[16]Some broker-dealers actually pay other brokers or dealers for routing orders their way, which is called "payment for order flow." Dealers do this because the profits from the spread are greater than the payments for flow. Also, the example showed the broker-dealer transacting in prices based on dollars and cents. NBBO quotes must be shown in penny increments, but dealers can actually conduct these transactions using prices that are in increments smaller than pennies as long as the total transaction value (i.e., price multiplied by number of shares) ends up with whole pennies. For example, 1,000 shares could be transacted at $12.00001 because the total value is $12,000.01 = 1,000($12.00001). This means that the client's price improvement relative to the NBBO can be quite small.

[17]See a report by the Chartered Financial Analysts Institute, "Dark Pools, Internalization, and Equity Market Quality," which can be accessed at **www.cfapubs.org/doi/pdf/10.2469/ccb.v2012.n5.1**.

[18]The name came from a time when most trading was on the floor of the NYSE. Block trades were not on the floor, so they were called "upstairs" trades.

trades, and block trades of at least 10,000 shares comprise about 3%.[19] These figures suggest that institutional investors are very active in the upstairs market provided by broker-dealers.

ALTERNATIVE TRADING SYSTEM (ATS): DARK POOLS

Recall that internalization in a standard broker-dealer network means that the broker-dealer is a counterparty in all trades: The broker-dealer buys stock from selling clients and sells the stock to buying clients. However, some broker-dealers also provide a different trading venue in which the broker-dealer is no longer a counterparty in all trades. Instead, buyers can trade directly with sellers. This is called an **alternative trading system (ATS)**.

Broker-dealers must register an ATS with the SEC, which imposes more regulatory requirements than it does for standard broker-dealer networks but fewer than for registered stock exchanges. It is costly for the broker-dealer to provide the infrastructure for an ATS, which usually has an automated matching engine. Therefore, the broker-dealer charges a subscription fee, which entitles a subscriber to trade with other subscribers using the ATS's infrastructure.

Like all trading venues, an ATS must comply with Reg NMS's order protection rule and report completed transactions to the consolidated tape system. However, an ATS is not required to report quotes from its order book to the consolidated quote system.[20] This means that pre-trade information (i.e., bid and ask prices) from an ATS is not available to the general public and is not included when the national best bid and offer (NBBO) prices are reported. Therefore, an ATS is commonly called a **dark pool**.

There are about 30 registered ATSs, accounting for about 13% of total stock market trading (based on dollar value), as shown in Table 1-3.

REGISTERED STOCK EXCHANGES

U.S. stock exchanges must register with the SEC and are more regulated than alternative trading systems or dealer-broker networks. In particular, the SEC requires **registered stock exchanges** to operate in a way that promotes orderly trading and fair dissemination of information, including transactions (price and number of shares) and pre-trade information (i.e., selected quote data from their order books).

As shown in Table 1-2, the NYSE and NASDAQ have the most listed stocks and are probably the most well-known U.S. stock exchanges. Before 2001, neither exchange used automated trading platforms to execute a significant percent of their trading volumes (trading at the NYSE was face-to-face on the floor of the exchange while trading at NASDAQ was through market makers). In response to competition from new exchanges with automated trading platforms, such as Cboe Global Markets, both the NYSE and NASDAQ now execute the majority of their stock trades via automated trading platforms.

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[19]See two SEC reports by Laura Tuttle: "OTC Trading: Description of Non-ATS OTC Trading in National Market System Stocks," March 2014, and "Alternative Trading Systems: Description of ATS Trading in National Market System Stocks," October 2013. These reports can be accessed at **www.sec.gov/divisions/riskfin/whitepapers/alternative-trading-systems-10-2013.pdf** and **www.sec.gov/marketstructure/research/otc_trading_march_2014.pdf**.

[20]Before 2005, the term "electronic communications network (ECN)" was commonly used to denote any automated trading platform. After Reg NMS was adopted, the definition of ECN was modified to mean an alternative trading system that uses an automated trading platform and that publicly reports order book information in much the same way as a registered stock exchange (i.e., reporting of order book quotes); see Reg NMS §242.600(b)(23) and §242.602(b)(5) at **www.sec.gov/rules/final/34-51808.pdf**. By 2015, all ECNs had been closed or converted to stock exchanges.

Competition has also fragmented trading. From 2005 to 2010, trading on the floor of the NYSE dropped from about 65% of all trading (based on dollar volume) to about 12%. Some of the reduction was due to cannibalization from affiliated exchanges (the NYSE Arca and NYSE MKT), but most was due to gains by other exchanges and by off-exchange trading in dark pools or through broker-dealer internalization.

Table 1-3 shows that about 35% of all trading (based on dollar values) takes place off-exchange, in the less regulated trading venues of dark pools and broker-dealer networks. The combination of technological advances and market fragmentation has led to a phenomenon called "high-frequency trading," as we explain next.

1-11c High-Frequency Trading (HFT)

Investors, broker-dealers, and high-frequency traders all buy and sell stocks. Here are some differences among them.

Most investors purchase stock with the intent of owning it until they think it is no longer a good investment or until they need cash for some other purpose. Some investors, like Warren Buffett, buy and hold for decades. Others, like actively managed mutual funds, buy and hold for about a year, on average. Of course, some investors hold stock only for weeks or days at a time.

In contrast, many broker-dealers often hold stock for a very short period. Recall that when a broker-dealer internalizes orders, it buys stock from one investor and sells to another almost immediately at a higher price. The profit is the broker-dealer's compensation for providing the infrastructure used by the investor to buy or sell shares.

High-frequency trading (HFT) is similar to broker-dealer internalization in that the HF trader buys stock and immediately sells it, profiting if the selling price is higher than the purchase price.[21] Unlike broker-dealer networks, HFT does not provide any infrastructure or other direct service for other buyers and sellers. Because the HFT trader is buying and selling many times a day (or even a second!), the process is called "high-frequency trading." HFT requires expensive computer systems and highly paid programmers, so most HFT is done by firms that are created for this purpose rather than by individual investors.

How does high-frequency trading work? HFT firms pay exchanges, like the NYSE, to let them place computers close to the exchanges' computers, an activity called "colocation." This reduces the time it takes for information about trading at the exchange to reach the HFT computers. HFT firms usually build or lease dedicated high-speed fiber-optic lines between their colocated computers at the different exchanges. Colocation and dedicated lines allow HFT firms to view information from one exchange, process it, and transmit it to another exchange in the blink of an eye. Actually, even a slow blinker can manage two or three blinks per second, whereas HFT computers can send and receive at least several hundred orders per second.

Recall that brokers send most limit orders to exchanges. If an order is large, there might not be big enough buyers at a single exchange to satisfy the order, so brokers often split large orders into smaller orders and send each one to a different exchange. For example, a broker might split an order to buy 600 shares of FedEx at $175 into 6 orders of 100 shares each. However, it might take longer for the order to reach one exchange than another. For example, it might take 1.5 milliseconds to reach the first exchange and 4.2 milliseconds to reach another exchange (there are 1,000 milliseconds in a second) due to slower electronic connections. A person would never notice such a short difference, but this is plenty of time

[21]High-frequency trading occurs in many different types of financial markets, but this discussion focuses on the stock market.

for the HFT computers at the first exchange to observe the order. If the trading algorithm decides that the order is just part of several more to come, then the computer might send a faster order over its fiber-optic connections to the other exchange, arriving before the broker's order. This is called "front running" because an order by the HFT gets in front of the order from the broker, even though the broker's order was placed first (albeit at a different exchange).[22] The HFT firm might be able to buy FedEx for $174.99 at the second exchange and then sell it for $175 when the broker's order finally arrives.[23] The net result is that the HFT firm pays $17,499 when it buys the 100 shares at $174.99 and receives $17,500 when it sells 100 shares at $175, for a net profit of $1.

This might look like a lot of effort for a small profit, which could even turn into a loss if the HFT algorithm isn't correct. However, small profits add up if they occur frequently. HFT accounts for 55% of total equity trading, generating about $1.1 billion in revenues for HFT firms in 2016.[24]

What is the net impact of HFT on financial markets? Let's take a look at liquidity, trading costs, and market stability. The total dollar volume of trading has grown from about $33 trillion in 2005 to $74 trillion in 2015, increasing market liquidity and allowing investors to trade more quickly.[25] Much of this increase in volume is due to HFT. However, critics argue that the HFTs provide false liquidity because HFT disappears when markets are falling, which is exactly when the market most needs liquidity.

The average bid-ask spread has shrunk to pennies for many stocks, which reduces costs to investors (and profits to dealers). HFT firms claim this is partially due to their trading, while critics attribute shrinking spreads to more competition and non-HFT advances in technology.

Critics also believe that HFT can destabilize the stock market, pointing to the flash crash of 2010, with the market falling by 9% in a matter of seconds but recovering almost as quickly. The SEC and Commodity Futures Trading Commission concluded that HFT contributed to this disruption but did not cause it. Critics also claim that HFT makes markets more volatile. Most academic studies show that HFT contributes to market volatility but by a relatively small amount.

In summary, the empirical evidence does not clearly show that HFT is especially helpful or harmful to well-functioning markets. However, some HFT revenues, such as those from front running, are direct costs to investors. To put that into perspective, the total value of stock trades in 2015 was about $74 trillion.[26] Based on $1.1 billion in HFT revenues, HFT trading represents an extra "fee" to investors of about 0.001% for each dollar traded ($1.1 billion/$74,000 billion = 0.001%). While HFT might "feel" unfair to non-HFT traders, there is no definitive evidence as to whether the costs of HFT exceed its possible benefits.

1-11d Stock Market Returns

As investors trade, stock prices change. When demand is high (lots of bids at high prices and for large quantities), stock prices go up; when demand is low (bids are only at low prices), stock prices go down.

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[22]This is just one example among many HFT strategies and computer algorithms.

[23]It is illegal for a broker to front-run by placing a personal order before submitting a client's order, but it is not illegal in HFT because the broker's orders arrive at different exchanges at different times even though they were simultaneously submitted by the broker.

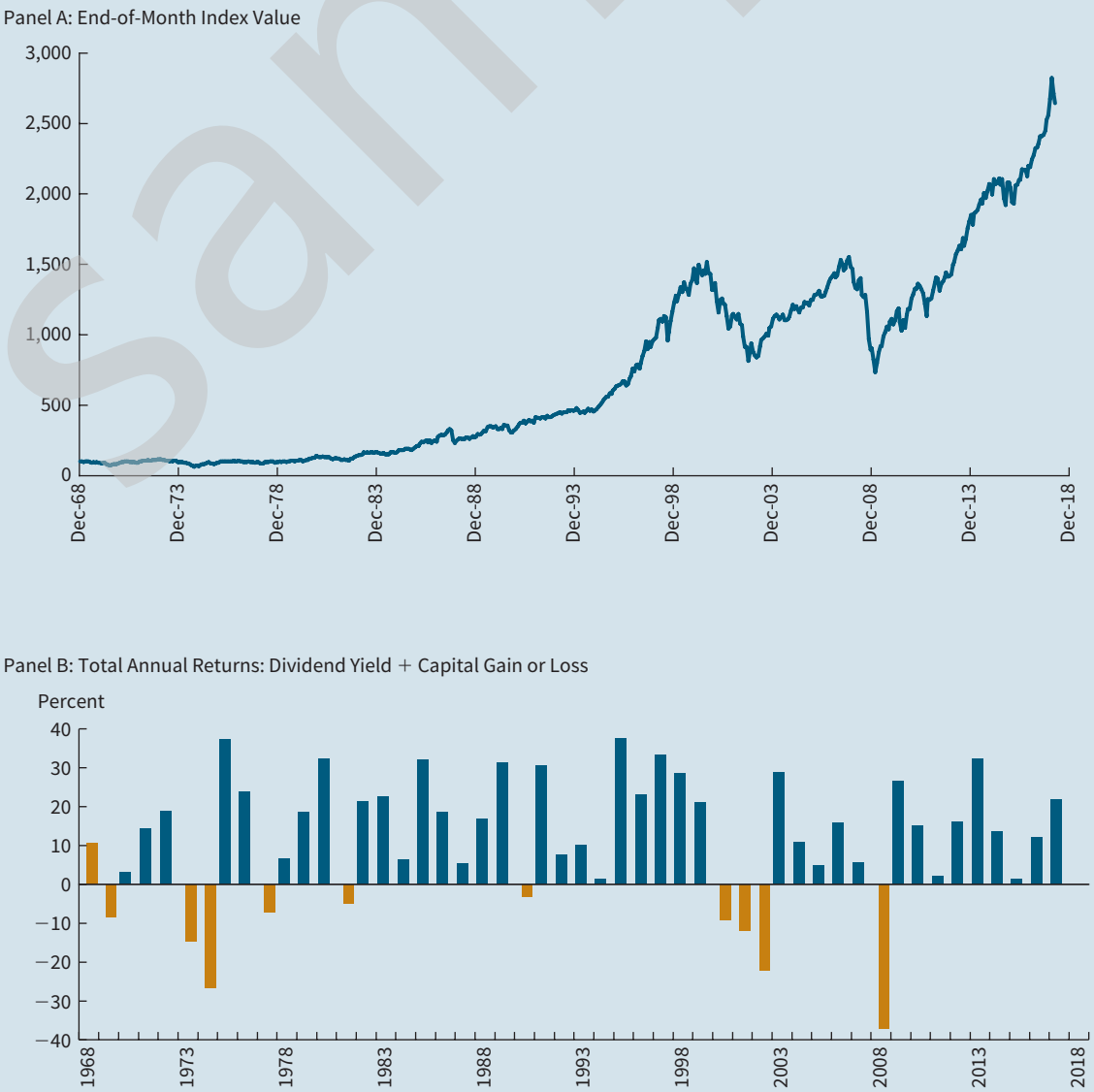
[24]HFT trading volume and revenues peaked in 2009 and have fallen since then, possibly due to increased competition among HFT firms. See **https://fas.org/sgp/crs/misc/R44443.pdf** and **www.bloomberg.com/news/articles/2017-07-13/they-re-the-world-s-fastest-traders-why-aren-t-they-thriving**.

[25] See Table 10 **www.sec.gov/reportspubs/select-sec-and-market-data/secstats2016.pdf.**

[26] See Table 10 in **www.sec.gov/reportspubs/select-sec-and-market-data/secstats2016.pdf.**

Figure 1-5 shows stock market levels and returns, as measured by the S&P 500 Index. Panel A shows that the market was relatively flat in the 1970s, increased somewhat in the 1980s, and has been a roller coaster ever since. Panel B highlights the year-to-year risk by showing total annual returns. Stocks have had positive returns in most years, but there have been several years with very large losses.

FIGURE 1-5
S&P 500 Stock Index Performance



Sources: Data for Panel A are from **http://finance.yahoo.com/quote/%5EGSPC/history?p=^GSPC**; the index is named ^GSPC. In Panel B, total returns prior to 2015 are from various issues of *The Wall Street Journal*. Returns for 2015 and subsequent years are based on the exchange-traded fund ^SP500TR, which replicates total S&P 500 returns; see **http://finance.yahoo.com/quote/%5ESP500TR/history?p=%5ESP500TR**.

SELF-TEST

Briefly describe the NBBO and the order protection rule. What regulation implemented them?

What does it mean to say that a trade was internalized at a broker-dealer?

What is an alternative trading system (ATS)? How does a trade at an ATS differ from an internalized trade at a broker-dealer?

How does the information that a registered stock exchange must display and report differ from that of an ATS? Why is an ATS often called a "dark pool"?

What percentage of stock trading is done off-exchange? On registered exchanges?

What is high-frequency trading? Describe a strategy through which a high-frequency trader makes a profit.

How is high-frequency trading similar to broker-dealer internalization? How is it different?

1-12 Finance and the Great Recession of 2007

Although the Great Recession of 2007 had many causes, mortgage securitization in the 2000s is certainly one culprit, so we begin with it.

1-12a The Globalization of Mortgage Market Securitization

A national TV program ran a documentary on the travails of Norwegian retirees resulting from defaults on Florida mortgages. Your first reaction might be to wonder how Norwegian retirees became financially involved with risky Florida mortgages. Let's start with a single home purchase in Florida.

1. HOME PURCHASE

In exchange for cash, a seller in Florida turned over ownership of a house to a buyer.

2. MORTGAGE ORIGINATION

To get the cash used to purchase the house, the buyer signed a mortgage loan agreement and gave it to an *originator*. Years ago, the originator would probably have been a **savings and loan association (S&L)**, which took in the vast majority of its deposits from individuals who lived in nearby neighborhoods. The S&L would make loans to homebuyers, who signed a contract promising to make interest and principal payments to the S&L, which used these payment to pay interest to its depositors and to issue new mortgages to other homebuyers. More recently, however, the originators have been specialized mortgage brokers who gathered and examined the borrower's credit information, arranged for an independent appraisal of the house's value, handled the paperwork, and received a fee for these services.

3. SECURITIZATION AND RESECURITIZATION

In exchange for cash, the originator sold the mortgage to a securitizing firm. For example, Merrill Lynch's investment banking operation was a major player in securitizing loans. It would bundle large numbers of mortgages into pools and then create new securities that had claims on the pools' cash flows. Some claims were simple, such as a proportional share of a pool; some were more complex, such as a claim on all interest payments during the first 5 years or a claim on only principal payments. More complicated claims were entitled to a fixed payment, while other claims would receive payments only after the senior

claimants had been paid. These slices of the pool were called *tranches*, which comes from a French word for "slice."

Some of the tranches were themselves recombined and then subdivided into securities called **collateralized debt obligations (CDOs)**, some of which were themselves combined and subdivided into other securities, commonly called "CDOs-squared." For example, Lehman Brothers often bought different tranches, split them into CDOs of differing risk, and then had the different CDOs rated by an agency like Moody's or Standard & Poor's.

There are three very important points to notice. First, the process didn't change the *total amount of risk* embedded in the mortgages, but it did make it possible to create some securities that were less risky than average and some that were more risky. Second, the complexity of the CDOs spread a little bit of each mortgage's risk to many different investors, making it difficult for investors to determine the aggregate risk of a particular CDO. Third, each time a new security was created or rated, fees were being earned by the investment banks and rating agencies.

4. THE INVESTORS

In exchange for cash, the securitizing firms sold the newly created securities to individual investors, hedge funds, college endowments, insurance companies, and other financial institutions, including a pension fund in Norway. Keep in mind that financial institutions are funded by individuals, so cash begins with individuals and flows through the system until it is eventually received by the seller of the home. If all goes according to plan, payments on the mortgages eventually return to the individuals who originally provided the cash. But in this case, the chain was broken by a wave of mortgage defaults, resulting in problems for Norwegian retirees.

Students and managers often ask, "What happened to all the money?" The short answer is, "It went from investors to home sellers, with fees being skimmed off all along the way."

Although the process is complex, in theory there is nothing inherently wrong with it. In fact, it should, in theory, provide more funding for U.S. home purchasers, and it should allow risk to be shifted to those best able to bear it. Unfortunately, this isn't the end of the story.

1-12b The Dark Side of Securitization: The Sub-Prime Mortgage Meltdown

What caused the financial crisis? Entire books have been written on this subject, but we can identify a few of the culprits.

REGULATORS APPROVED SUB-PRIME STANDARDS

In the 1980s and early 1990s, regulations did not permit a non-qualifying mortgage to be securitized, so most originators mandated that borrowers meet certain requirements, including having at least a certain minimum level of income relative to the mortgage payments and a minimum down payment relative to the size of the mortgage. But in the mid-1990s, Washington politicians wanted to extend home ownership to groups that traditionally had difficulty obtaining mortgages. To accomplish this, regulations were relaxed so that non-qualifying mortgages could be securitized. Such loans are commonly called "sub-prime" or "Alt-A" mortgages. Thus, riskier mortgages were soon being securitized and sold to investors. Again, there was nothing inherently wrong, provided the two following questions were being answered in the affirmative: One, were home buyers making sound decisions regarding their ability to repay the loans? And two, did the ultimate investors recognize the additional

risk? We now know that the answer to both questions is a resounding "No." Homeowners were signing mortgages that they could not hope to repay, and investors treated these mortgages as if they were much safer than they actually were.

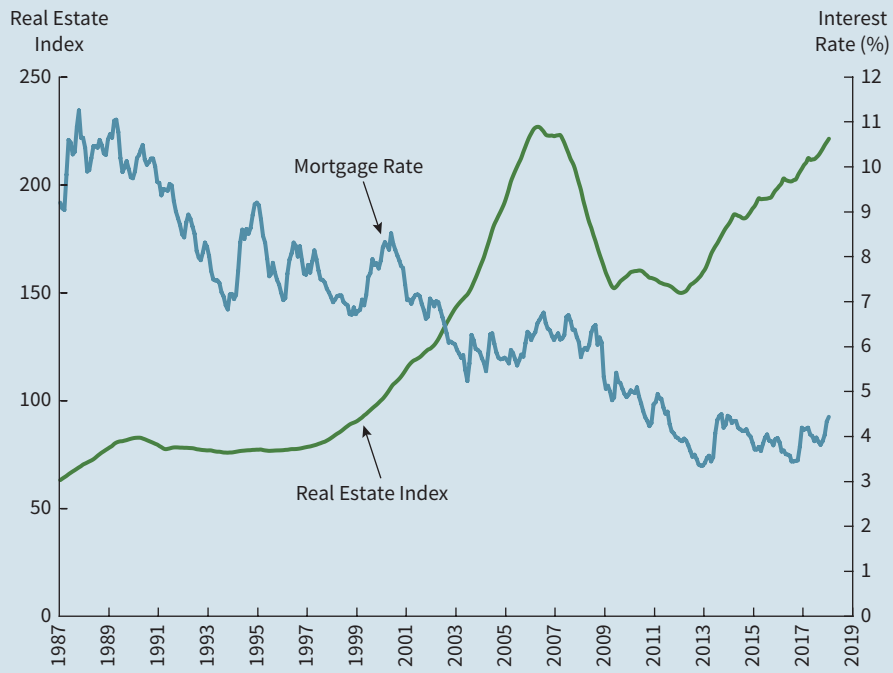
THE FED HELPED FUEL THE REAL ESTATE BUBBLE

With more people able to get a mortgage, including people who should not have obtained one, the demand for homes increased. This alone would have driven up house prices. However, the Fed also slashed interest rates to historic lows after the terrorist attacks of 9/11 to prevent a recession, and it kept them low for a long time. These low rates made mortgage payments lower, which made home ownership seem even more affordable, again contributing to an increase in the demand for housing. Figure 1-6 shows that the combination of lower mortgage qualifications and lower interest rates caused house prices to skyrocket. Thus, the Fed contributed to an artificial bubble in real estate.

HOME BUYERS WANTED MORE FOR LESS

Even with low interest rates, how could sub-prime borrowers afford the mortgage payments, especially with house prices rising? First, most sub-prime borrowers chose

FIGURE 1-6
The Real Estate Boom: Housing Prices and Mortgage Rates



Notes:

1. The real estate index is the Case-Shiller composite index for house prices in 10 real estate markets, not seasonally adjusted, available at the Federal Reserve Bank of St. Louis's FRED® Economic Data: **http://research.stlouisfed.org/fred2/series/SPCS10RSA**.
2. Interest rates are for 30-year conventional fixed-rate mortgages. Before September 2016, go to **https://fred.stlouisfed.org/series/MORTG**. After September 2016, go to **www.freddiemac.com/pmms/pmms_archives.html**, scroll down to "Historical Data," and download monthly data for the 30-year fixed rate mortgage.

an adjustable-rate mortgage (ARM) with an interest rate based on a short-term rate, such as that on 1-year Treasury bonds, to which the lender added a couple of percentage points. Because the Fed had pushed short-term rates so low, the initial rates on ARMs were very low.

With a traditional fixed-rate mortgage, the payments remain fixed over time. But with an ARM, an increase in market interest rates triggers higher monthly payments, so an ARM is riskier than a fixed-rate mortgage. However, many borrowers chose an *even riskier* mortgage, the "option ARM," where the borrower can choose to make such low payments during the first couple of years that they don't even cover the interest, causing the loan balance to actually increase each month! At a later date, the payments would be reset to reflect both the current market interest rate and the higher loan balance. For example, in some cases a monthly payment of $948 for the first 32 months was reset to $2,454 for the remaining 328 months.

Why would anyone who couldn't afford to make a $2,454 monthly payment choose an option ARM? Here are three possible reasons. First, some borrowers simply didn't understand the situation and were victims of predatory lending practices by brokers eager to earn fees regardless of the consequences. Second, some borrowers thought that the home price would go up enough to allow them to sell at a profit or else refinance with another low-payment loan. Third, some people were simply greedy and shortsighted, and they wanted to live in a better home than they could afford.

MORTGAGE BROKERS DIDN'T CARE

Years ago, S&Ls and banks had a vested interest in the mortgages they originated because they held them for the life of the loan—up to 30 years. If a mortgage went bad, the bank or S&L would lose money, so they were careful to verify that the borrower would be able to repay the loan. In the bubble years, though, over 80% of mortgages were arranged by independent mortgage brokers who received a commission. Thus, the broker's incentive was to complete deals even if the borrowers couldn't make the payments after the soon-to-come reset. So it's easy to understand (but not to approve of!) why brokers pushed deals onto borrowers who were almost certain to default eventually.

REAL ESTATE APPRAISERS WERE LAX

The relaxed regulations didn't require the mortgage broker to verify the borrower's income, so these loans were called "liar loans" because the borrowers could overstate their income. But even in these cases, the broker had to get an appraisal showing that the house's value was greater than the loan amount. Many real estate appraisers simply assumed that house prices would keep going up, so they were willing to appraise houses at unrealistically high values. Like the mortgage brokers, they were paid at the time of their service. Other than damage to their reputations, they weren't concerned if the borrower later defaulted and the value of the house turned out to be less than the remaining loan balance, causing a loss for the lender.

ORIGINATORS AND SECURITIZERS WANTED QUANTITY, NOT QUALITY

Originating institutions like Countrywide Financial and New Century Mortgage made money when they sold the mortgages, long before any of the mortgages defaulted. The same is true for securitizing firms such as Bear Stearns, Merrill Lynch, and Lehman Brothers. Their incentives were to generate volume through originating loans, not to ensure that the loans were safe investments. This started at the top—CEOs and other top executives received stock options and bonuses based on their firms' profits, and profits depended on volume. Thus, the top officers pushed their subordinates to generate volume,

those subordinates pushed the originators to write more mortgages, and the originators pushed the appraisers to come up with high values.

RATING AGENCIES WERE LAX

Investors who purchased the complicated mortgage-backed securities wanted to know how risky they were, so they insisted on seeing the bonds' "ratings." The securitizing firms paid rating agencies to investigate the details of each bond and to assign a rating that reflected the security's risk. For example, Lehman Brothers hired Moody's to rate some of its CDOs. Indeed, the investment banks would actually pay for advice from the rating agencies as they were designing the securities. The rating and consulting activities were extremely lucrative for the agencies, which ignored the obvious conflict of interest: The investment bank wanted a high rating, the rating agency got paid to help design securities that would qualify for a high rating, and high ratings led to continued business for the raters.

INSURANCE WASN'T INSURANCE

To provide a higher rating and make these mortgage-backed securities look even more attractive to investors, the issuers would frequently purchase a type of insurance policy on the security called a **credit default swap (CDS)**. For example, suppose you had wanted to purchase a CDO from Lehman Brothers but worried about the risk. What if Lehman Brothers had agreed to pay an annual fee to an insurance company such as AIG, which would guarantee the CDO's payments if the underlying mortgages defaulted? You probably would have felt confident enough to buy the CDO.

But any similarity to a conventional insurance policy ends here. Unlike home insurance, where there is a single policyholder and a single insurer, totally uninvolved speculators can also make bets on your CDO by either selling or purchasing credit default swaps on the CDO. For example, a hedge fund could buy a credit default swap on your CDO if it thinks the CDO will default, or an investment bank like Bear Stearns could sell a swap, betting that the CDO won't default. In fact, the International Swaps and Derivatives Association estimates that in mid-2008 there was about $54 trillion in credit default swaps. This staggering amount was approximately 7 times the value of all U.S. mortgages, was over 4 times the level of the U.S. national debt, and was over twice the value of the entire U.S. stock market.

Another big difference is that home insurance companies are highly regulated, but there was virtually no regulation in the credit default swap market. The players traded directly among themselves, with no central clearinghouse. It was almost impossible to tell how much risk any of the players had taken on, making it impossible to know whether or not counterparties like AIG would be able to fulfill their obligations in the event of a CDO default. And that made it impossible to know the value of CDOs held by many banks, which in turn made it impossible to judge whether or not those banks were de facto bankrupt.

ROCKET SCIENTISTS HAD POOR REARVIEW MIRRORS AND RISK MANAGERS DROVE BLIND

Financial engineers are brilliant experts, often trained in physics and hired from rocket science firms, who build elegant models to determine the value of a new security. Unfortunately, a model is only as good as its inputs. The experts looked at the high growth rates of recent real estate prices (see Figure 1-6) and assumed that future growth rates also would be high. These high growth rates caused models to calculate very high CDO prices. Perhaps more surprisingly, many risk managers simply did not insist on seeing scenarios in which housing prices fell.

INVESTORS WANTED MORE FOR LESS

In the early 2000s, low-rated debt (including mortgage-backed securities), hedge funds, and private equity funds produced great rates of return. Many investors jumped into this debt to keep up with the Joneses, focusing primarily on returns and largely ignoring risk. In fairness, some investors assumed the credit ratings were accurate, and they trusted the representatives of the investment banks selling the securities. In retrospect, however, Warren Buffett's maxim "I only invest in companies I understand" seems wiser than ever.

THE EMPEROR HAD NO CLOTHES

In 2006, many of the option ARMs began to reset, borrowers began to default, and home prices first leveled off and then began to fall. Things got worse in 2007 and 2008, and by early 2009, almost 1 out of 10 mortgages was in default or foreclosure, resulting in displaced families and virtual ghost towns of new subdivisions. As homeowners defaulted on their mortgages, so did the CDOs backed by the mortgages. That brought down the counterparties like AIG, who had insured the CDOs via credit default swaps. Virtually overnight, investors realized that mortgage-backed security default rates were headed higher and that the houses used as collateral were worth less than the mortgages. Mortgage-backed security prices plummeted, investors quit buying newly securitized mortgages, and liquidity in the secondary market disappeared. Thus, the investors who owned these securities were stuck with pieces of paper worth substantially less than the values reported on their balance sheets.

1-12c From Sub-Prime Meltdown to Liquidity Crisis to Economic Crisis

Like the Andromeda strain, the sub-prime meltdown went viral, and it ended up infecting almost all aspects of the economy. But why did a burst bubble in one market segment, sub-prime mortgages, spread across the globe?

First, securitization allocated the sub-prime risk to many investors and financial institutions. The huge amount of credit default swaps linked to sub-prime-backed securities spread the risk to even more institutions. Unlike previous downturns in a single market, such as the dot-com bubble in 2002, the decline in the sub-prime mortgage values affected many, if not most, financial institutions.

Second, banks were more vulnerable than at any time since the 1929 Depression. Congress had repealed the Glass-Steagall Act in 1999, allowing commercial banks and investment banks to be part of a single financial institution. The SEC compounded the problem in 2004 when it allowed large investment banks' brokerage operations to take on much higher leverage. Some, like Bear Stearns, ended up with $33 of debt for every dollar of its own equity. With such leverage, a small increase in the value of its investments would create enormous gains for the equity holders and large bonuses for the managers; conversely, a small decline would ruin the firm.

When the sub-prime market mortgages began defaulting, mortgage companies were the first to fall. Many originating firms had not sold all of their sub-prime mortgages, and they failed. For example, New Century declared bankruptcy in 2007, IndyMac was placed under FDIC control in 2008, and Countrywide was acquired by Bank of America in 2008 to avoid bankruptcy.

Securitizing firms also crashed, partly because they kept some of the new securities they created. For example, Fannie Mae and Freddie Mac had huge losses on their portfolio assets, causing them to be virtually taken over by the Federal Housing Finance Agency in 2008. In addition to big losses on their own sub-prime portfolios, many investment banks

also had losses related to their positions in credit default swaps. Thus, Lehman Brothers was forced into bankruptcy, Bear Stearns was sold to JPMorgan Chase, and Merrill Lynch was sold to Bank of America, with huge losses to stockholders.

Because Lehman Brothers defaulted on some of its commercial paper, investors in the Reserve Primary Fund, a big money market mutual fund, saw the value of its investments "break the buck," dropping to less than a dollar per share. To avoid panic and a total lockdown in the money markets, the U.S. Treasury agreed to insure some investments in money market funds.

AIG was the largest backer of credit default swaps, and it operated worldwide. In 2008 it became obvious that AIG could not honor its commitments as a counterparty, so the Fed effectively nationalized AIG to avoid a domino effect in which AIG's failure would topple hundreds of other financial institutions.

In normal times, banks provide liquidity to the economy and funding for creditworthy businesses and individuals. These activities are crucial for a well-functioning economy. However, the financial contagion spread to commercial banks because some owned mortgage-backed securities, some owned commercial paper issued by failing institutions, and some had exposure to credit default swaps. As banks worried about their survival in the fall of 2008, they stopped providing credit to other banks and businesses. The market for commercial paper dried up to such an extent that the Fed began buying new commercial paper from issuing companies.

Prior to the sub-prime meltdown, many nonfinancial corporations had been rolling over short-term financing to take advantage of low interest rates on short-term lending. When the meltdown began, banks began calling in loans rather than renewing them. In response, many companies began throttling back their capital investment plans.

Anatomy of a Toxic Asset

Consider the dismal history of one particular toxic asset named "GSAMP Trust 2006-NC2." This toxic asset began life as 3,949 individual mortgages issued by New Century in 2006 with a total principal of about $881 million. Almost all were adjustable-rate mortgages, half were concentrated in just two states (California and Florida), and many of the borrowers had previous credit problems. Goldman Sachs bought the mortgages, pooled them into a trust, and divided the trust into 16 "debt" tranches called mortgage-backed securities (MBSs). The tranches had different provisions regarding distribution of payments should there be any defaults, with senior tranches getting paid first and junior tranches getting paid only if funds were available. Despite the mortgages' poor quality and the pool's lack of diversification, Moody's and Standard & Poor's gave most tranches good ratings, with over 79% rated AAA.

Five years later, in July 2011, about 36% of the underlying mortgages were behind in payments, defaulted, or even foreclosed. Not surprisingly, the market prices of the mortgage-backed securities had plummeted. These were very toxic assets indeed!

The story doesn't end here. Fannie Mae and Freddie Mac had purchased some of these toxic assets and taken a beating. In September 2011, the Federal Housing Finance Agency (now the conservator of Fannie Mae and Freddie Mac) sued Goldman Sachs, alleging that Goldman Sachs had knowingly overstated the value of the securities in the prospectuses. The FHFA also alleged that at the very same time Goldman Sachs was selling these and other mortgage-backed securities to Fannie and Freddie, Goldman was (1) trying to get rid of the mortgages by "putting" them back to New Century and (2) was "betting" against the mortgages in the credit default swap market. Goldman settled the suit in 2014 by agreeing to pay $1.2 billion, but it is safe to say that these toxic assets will continue to poison our economy for years to come.

Sources: Adam B. Ashcraft and Til Schuermann, *Understanding the Securitization of Subprime Mortgage Credit*, Federal Reserve Bank of New York Staff Reports, no. 318, March 2008; John Cassidy, *How Markets Fail* (New York: Farrar, Straus and Giroux, 2009), pp. 260–272; and the Federal Housing Finance Agency, **www.fhfa.gov/Media/PublicAffairs/Pages/FHFA-Announces-Settlement-with-Goldman-Sachs.aspx**.

Consumers and small businesses faced a similar situation: With credit harder to obtain, consumers cut back on spending, and small businesses cut back on hiring. Plummeting real estate prices caused a major contraction in the construction industry, putting many builders and suppliers out of work.

What began as a slump in housing prices caused enormous distress for commercial banks, not just mortgage companies. Commercial banks cut back on lending, which caused difficulties for nonfinancial business and consumers. Similar scenarios played out all over the world, resulting in the worst recession in the United States since 1929.

1-12d Responding to the Economic Crisis

Unlike the beginning of the 1929 Depression, the U.S. government did not take a hands-off approach in the most recent crisis. In late 2008, Congress passed the Troubled Asset Relief Plan (TARP), which authorized the U.S. Treasury to purchase mortgage-related assets from financial institutions. The intent was to simultaneously inject cash into the banking system and get these toxic assets off banks' balance sheets. The Emergency Economic Stabilization Act of 2008 (EESA) allowed the Treasury to purchase preferred stock in banks (whether they wanted the investment or not). Again, this injected cash into the banking system. Most of the large banks have already paid back the funding they received from the TARP and EESA financing, although it is doubtful whether all recipients will be able to do so. Fannie Mae and Freddie Mac have also paid the government more than they received in the bailout.

Although TARP and EESA were originally intended for financial institutions, they were subsequently modified so that the Treasury was able to make loans to GM and Chrysler in 2008 and early 2009 so that they could stave off immediate bankruptcy. Both GM and Chrysler went into bankruptcy in the summer of 2009 despite government loans, but they quickly emerged as stronger companies with the government owning some of the newly issued shares of stock. The U.S. government has since sold all of the shares issued to it by Chrysler and GM.

The government also used traditional measures, such as stimulus spending, tax cuts, and monetary policy: (1) The American Recovery and Reinvestment Act of 2009 provided over $700 billion in direct stimulus spending for a variety of federal projects and aid for state projects. (2) In 2010, the government temporarily cut Social Security taxes from 6.2% to 4.2%. (3) In addition to purchasing mortgage-related assets under the TARP program, the Federal Reserve has purchased around $2 trillion in long-term T-bonds from financial institutions, a process called *quantitative easing*.

Did the response work? When we wrote this in mid-2018, real GDP (gross domestic product) was much higher than before the crisis, and the unemployment rate was down to 4.1%, much lower than its 2009 high of 10% and close to its pre-crisis level of 4.4%. In fact, the U.S. recovery has been much stronger than that of Europe.[27]

1-12e Preventing the Next Crisis

Can the next crisis be prevented? Congress passed the **Dodd-Frank Wall Street Reform and Consumer Protection Act** in 2010 as an attempt to do just that. Following is a brief summary of some major elements in the Act.

[27]For a comparison of this crisis with 15 previous banking crises, see Serge Wind, "A Perspective on 2000's Illiquidity and Capital Crisis: Past Banking Crises and Their Relevance to Today's Credit Crisis," *Review of Business*, Vol. 31, No. 1, Fall 2010, pp. 68–83.

PROTECT CONSUMERS FROM PREDATORS AND THEMSELVES

Dodd-Frank established the Consumer Financial Protection Bureau, whose objectives include ensuring that borrowers fully understand the terms and risks of the mortgage contracts, that mortgage originators verify borrower's ability to repay, and that originators maintain an interest in the borrowers by keeping some of the mortgages they originate. The Bureau also watches over other areas in which consumers might have been targets of predatory lending practices, such as credit cards, debit cards, and payday loans.

As of 2017, the Bureau has fielded over 1.2 million consumer complaints and has levied over $11.9 billion in fines on financial institutions. The Bureau used the collected fines to provide monetary compensation to over 29 million wronged consumers.

SEPARATE BANKING FROM SPECULATING

The act's **Volcker rule**, named after former Fed chairman Paul Volcker, would greatly limit a bank's proprietary trading, such as investing the banks' own funds into hedge funds. The basic idea is to prevent banks from making highly leveraged bets on risky assets.

INCREASE TRANSPARENCY AND REDUCE RISK DUE TO DERIVATIVES TRADING

Title VII of the Dodd-Frank Act provides for more oversight of hedge funds and credit-rating agencies in an effort to spot potential landmines before they explode. More importantly, it attempts to reduce the financial system's exposure to risk caused by derivative trading, especially the risk stemming from swaps.

A swap is a contract in which one party swaps something with another party. For example, one party might make payments that fluctuate with interest rates to another party (called the "counterparty") in exchange for payments that do not fluctuate—the two parties "swap" payments. Because the swaps are traded directly between two parties, the risk that one party defaults is borne by the other party. The market for swaps is huge, with a value of almost $250 trillion![28] If there is a series of swaps linking various counterparties, then the default by one can trigger financial difficulties for all. Title VII in the Dodd-Frank Act directly addresses this situation.

Rather than two parties entering a custom-made swap contract directly between themselves, Title VII calls for most swaps to be standardized and traded in a public market made by either a *designated contract market (DCM)*, which is like a market maker, or a *swap execution facility (SEF)*, which is an automated trading platform. These markets provide information about trades and market activity, which should provide greater transparency.

In addition, all swap transactions must be sent to a registered *derivatives clearing organization (DCO)*, which "clears" the transaction by agreeing to ensure payments if one of the swap parties defaults. In other words, the risk of default by one party is shifted from the counterparty to the clearinghouse (i.e., the DCO). Of course, the clearinghouse reduces its risk by requiring collateral from each of the swap parties. The SEC and the Commodities Futures Trading Commission also regulate and monitor the clearinghouses.

[28]For updates on the swap markets, see **www.cftc.gov/MarketReports/SwapsReports/NotionalOutstanding/index.htm** and select "Cleared Status." This provides information for the swaps most likely to affect banks, including interest rate swaps, credit default swaps, and cross-currency swaps.

In late 2012, about 42% of swaps were cleared; by April 2018, about 63% were cleared. There are still too many uncleared swaps, but the Dodd-Frank Act is improving transparency and reducing the financial system's exposure to swap trading.

HEAD OFF AND REIN IN SYSTEMIC FAILURES AT TOO-BIG-TO-FAIL BANKS

When a bank gets extremely large and has business connections with many other companies, it can be very dangerous to the rest of the economy if the institution fails and goes bankrupt, as the 2008 failure of Lehman Brothers illustrates. In other words, a bank or other financial institution can become "too big to fail." *Systemic risk* is defined as something that affects most companies. When there are a large number of too-big-to-fail institutions and systemic shock hits, the entire world can be dragged into a recession, as we saw in 2008.

Dodd-Frank gives regulators more oversight of too-big-to-fail institutions, including all banks with $50 billion in assets and any other financial institutions that the Financial Stability Oversight Council deems systemically important. In mid-2018, there were 10 nonbank institutions that were designated as systemically important, including insurance companies and clearinghouses.

This oversight includes authority to require additional capital or reductions in leverage if conditions warrant. In addition, these institutions must prepare "transition" plans that would make it easier for regulators to liquidate the institution should it fail. In other words, this provision seeks to reduce the likelihood that a giant financial institution will fail and to minimize the damage if it does fail.

POLITICS AND REGULATION

Is the Dodd-Frank Act needed to prevent future crises or is it regulatory overreach that restricts economic growth? We don't know the answer to that question right now (early 2018), but we do know that the House of Representative passed a bill to repeal Dodd-Frank. The Senate has not voted on the House's bill but has instead introduced its own bill to make major changes in the Dodd-Frank Act. The Senate's bill significantly increases risk by easing constraints, such as redefining a too-big-to-fail financial institution as one with assets greater than $250 billion, significantly more than the previous threshold of $50 billion. By the time you read this, it is likely that the President will have signed a bill that significantly decreases regulatory requirements but that also increases risk. Whether these actions stimulate growth or precipitate another financial crisis remains to be seen.

SELF-TEST

Briefly describe the process that led from a homeowner purchasing a home to an investor purchasing a collateralized debt obligation.

How is a credit default swap like insurance?

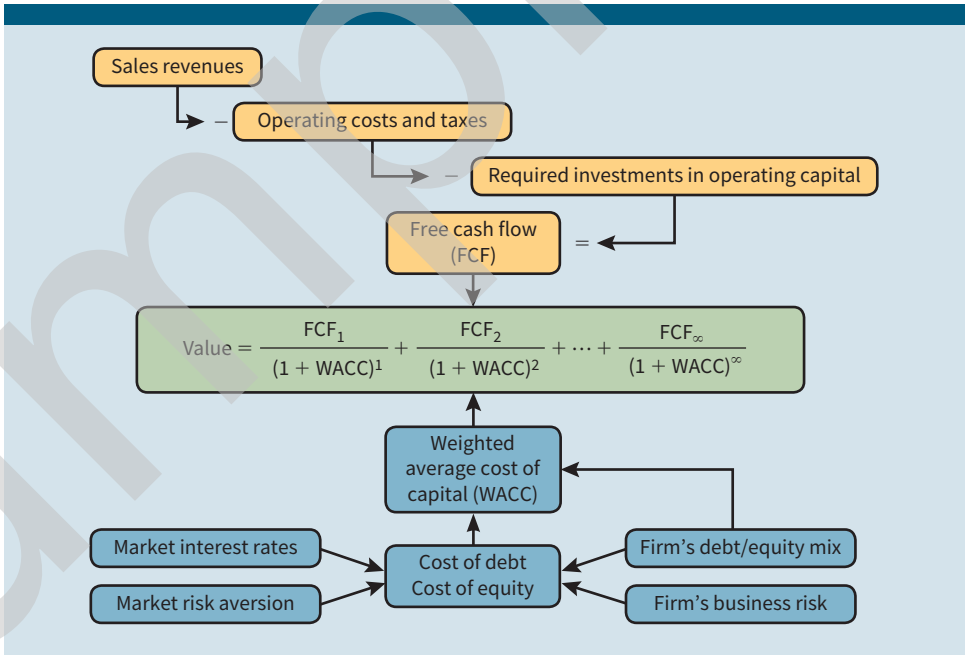
Describe some of the motives and mistakes made by the Fed, home buyers, mortgage brokers, real estate appraisers, mortgage originators, mortgage securitizers, financial engineers, and investors.

What triggered the financial crisis and how did it spread to the rest of the economy?

How did the federal government respond to the crisis?

What provisions in the Dodd-Frank Wall Street Reform and Consumer Protection Act are designed to prevent a future financial crisis?

FIGURE 1-7
The Determinants of Intrinsic Value: The Big Picture



1-13 The Big Picture

Finance has vocabulary and tools that might be new to you. To help you avoid getting bogged down in the trenches, Figure 1-7 presents the big picture. A manager's primary job is to increase the company's intrinsic value, but how exactly does one go about doing that? The equation in the center of Figure 1-7 shows that intrinsic value is the present value of the firm's expected free cash flows, discounted at the weighted average cost of capital. Thus, there are two approaches for increasing intrinsic value: improve FCF or reduce the WACC. Observe that several factors affect FCF and several factors affect the WACC. In the rest of the book's chapters, we will typically focus on only one of these factors, systematically building the vocabulary and tools that you will use after graduation to improve your company's intrinsic value. It is true that every manager needs to understand financial vocabulary and be able to apply financial tools, but successful managers also understand how their decisions affect the big picture. So as you read this book, keep in mind where each topic fits into the big picture.

e-Resources

resource

When we think it might be helpful for you to look at resources on the book's Web site, we'll show an icon in the margin like the one shown here. The Web site contains several types of files that will be helpful to you:

1. It contains *Excel* files, called ***Tool Kits***, that provide well-documented models for almost all of the text's calculations. Not only will these ***Tool Kits*** help you with this finance course, but they also will serve as tool kits for you in other courses and in your career.

2. There are problems at the end of the chapters that require spreadsheets, and the Web site contains the models you will need to begin work on these problems.

Other resources are also on the Web site, including an electronic library that contains Adobe PDF files for "extensions" to many chapters that cover additional useful material related to the chapter.

SUMMARY

- **Financial markets** are simply ways of connecting providers of cash with users of cash. Providers exchange cash now for claims on uncertain future cash.
- The three main forms of business organization are the **proprietorship**, the **partnership**, and the **corporation**. Although each form of organization offers advantages and disadvantages, *corporations conduct much more business than the other forms.*
- **Going public** is called an **initial public offering (IPO)** because it is the first time the company's shares are sold to the general public.
- **Free cash flow (FCF)** is the cash flow available (or free) for distribution to a company's investors, including creditors and stockholders, after the company has made investments to sustain ongoing operations.
- The **weighted average cost of capital (WACC)** is the average return required by all of the firm's investors. It is determined by the firm's *capital structure* (the firm's relative amounts of debt and equity), *interest rates*, the firm's *risk*, and *the market's attitude toward risk.*
- The value of a firm depends on the size of the firm's free cash flows, the timing of those flows, and their risk. If the expected future free cash flows and the cost of capital incorporate all relevant information, then a firm's **fundamental value** (also called **intrinsic value**) is defined by:

$$\text{Value} = \frac{\text{FCF}_1}{(1 + \text{WACC})^1} + \frac{\text{FCF}_2}{(1 + \text{WACC})^2} + \frac{\text{FCF}_3}{(1 + \text{WACC})^3} + \cdots + \frac{\text{FCF}_\infty}{(1 + \text{WACC})^\infty}$$

- The primary objective of management should be to maximize *stockholders' wealth*, and this means *maximizing the company's fundamental value.* Legal actions that maximize stock prices usually increase social welfare.
- Transfers of capital between borrowers and savers take place (1) by direct transfers of money and securities; (2) by transfers through **investment banks**, which act as go-betweens; and (3) by transfers through **financial intermediaries**, which create new securities.
- A **financial security** is a claim on future cash flows that is standardized and regulated. Debt, equity, and derivatives are the primary types of financial securities.
- **Derivatives**, such as options, are claims on other financial securities. In **securitization**, new securities are created from claims on packages of financial assets.
- The prospect of more money in the future is *required* to induce an investor to give up money today. This is a **required rate of return** from an investor's perspective and a cost from the user's point of view.
- Four fundamental factors affect the required rate of return (i.e., the cost of money): (1) production opportunities, (2) time preferences for consumption, (3) risk, and (4) inflation.
- **Spot markets** and **futures markets** are terms that refer to whether the assets are bought or sold for "on-the-spot" delivery or for delivery at some future date.
- **Money markets** are the markets for debt securities with maturities of less than a year. **Capital markets** are the markets for long-term debt and corporate stocks.

- **Primary markets** are the markets in which corporations raise new capital. **Secondary markets** are markets in which existing, already outstanding securities are traded among investors.
- A **trading venue** is a site (geographical or electronic) where secondary market trading occurs.
- Orders from buyers and sellers can be matched in one of three ways: (1) in a face-to-face **open outcry auction**, (2) through a computer network of **dealer markets**, and (3) through **automated trading platforms** with computers that match orders and execute trades.
- Registered stock exchanges (like the NYSE or NASDAQ) must display pre-trade quotes. **Broker-dealer networks** and **alternative trading systems (ATS)** (which are called **dark pools**) conduct **off-exchange** trading and are not required to display pre-trade information.
- The **Dodd-Frank Wall Street Reform and Consumer Protection Act** was passed in 2010 in an effort to prevent financial crises such as the one that triggered the Great Recession of 2007.
- ***Web Extension 1A*** discusses derivatives.

QUESTIONS

(1-1) Define each of the following terms:

a. Proprietorship; partnership; corporation; charter; bylaws
b. Limited partnership; limited liability partnership; professional corporation
c. Stockholder wealth maximization
d. Money market; capital market; primary market; secondary market
e. Private markets; public markets; derivatives
f. Investment bank; financial services corporation; financial intermediary
g. Mutual fund; money market fund
h. Physical location exchange; computer/telephone network
i. Open outcry auction; dealer market; automated trading platform
j. Production opportunities; time preferences for consumption
k. Foreign trade deficit

(1-2) What are the three principal forms of business organization? What are the advantages and disadvantages of each?

(1-3) What is a firm's fundamental value (which is also called its intrinsic value)? What might cause a firm's intrinsic value to be different from its actual market value?

(1-4) Edmund Corporation recently made a large investment to upgrade its technology. Although these improvements won't have much of an impact on performance in the short run, they are expected to reduce future costs significantly. What impact will this investment have on Edmund's earnings per share this year? What impact might this investment have on the company's intrinsic value and stock price?

(1-5) Describe the ways in which capital can be transferred from suppliers of capital to those who are demanding capital.

(1-6) What are financial intermediaries, and what economic functions do they perform?

(1-7) Is an initial public offering an example of a primary or a secondary market transaction?

(1-8) Contrast and compare trading in face-to-face auctions, dealer markets, and automated trading platforms.

(1-9) Describe some similarities and differences among broker-dealer networks, alternative trading systems (ATS), and registered stock exchanges.

(1-10) What are some similarities and differences between the NYSE and the NASDAQ Stock Market?

MINI CASE

Assume that you recently graduated and have just reported to work as an investment advisor at the brokerage firm of Balik and Kiefer Inc. One of the firm's clients is Michelle DellaTorre, a professional tennis player who has just come to the United States from Chile. DellaTorre is a highly ranked tennis player who would like to start a company to produce and market apparel she designs. She also expects to invest substantial amounts of money through Balik and Kiefer. DellaTorre is very bright, and she would like to understand in general terms what will happen to her money. Your boss has developed the following set of questions you must answer to explain the U.S. financial system to DellaTorre.

a. Why is corporate finance important to all managers?
b. Describe the organizational forms a company might have as it evolves from a start-up to a major corporation. List the advantages and disadvantages of each form.
c. How do corporations go public and continue to grow? What are agency problems? What is corporate governance?
d. What should be the primary objective of managers?
   (1) Do firms have any responsibilities to society at large?
   (2) Is stock price maximization good or bad for society?
   (3) Should firms behave ethically?
e. What three aspects of cash flows affect the value of any investment?
f. What are free cash flows?
g. What is the weighted average cost of capital?
h. How do free cash flows and the weighted average cost of capital interact to determine a firm's value?
i. Who are the providers (savers) and users (borrowers) of capital? How is capital transferred between savers and borrowers?
j. What do we call the cost that a borrower must pay to use debt capital? What two components make up the cost of using equity capital? What are the four most fundamental factors that affect the cost of money, or the general level of interest rates, in the economy?
k. What are some economic conditions that affect the cost of money?
l. What are financial securities? Describe some financial instruments.
m. List some financial institutions.
n. What are some different types of markets?
o. Along what two dimensions can we classify trading procedures?
p. What are the differences between market orders and limit orders?
q. Explain the differences among broker-dealer networks, alternative trading systems, and registered stock exchanges.
r. Briefly explain mortgage securitization and how it contributed to the global economic crisis.

CHAPTER 2

Financial Statements, Cash Flow, and Taxes

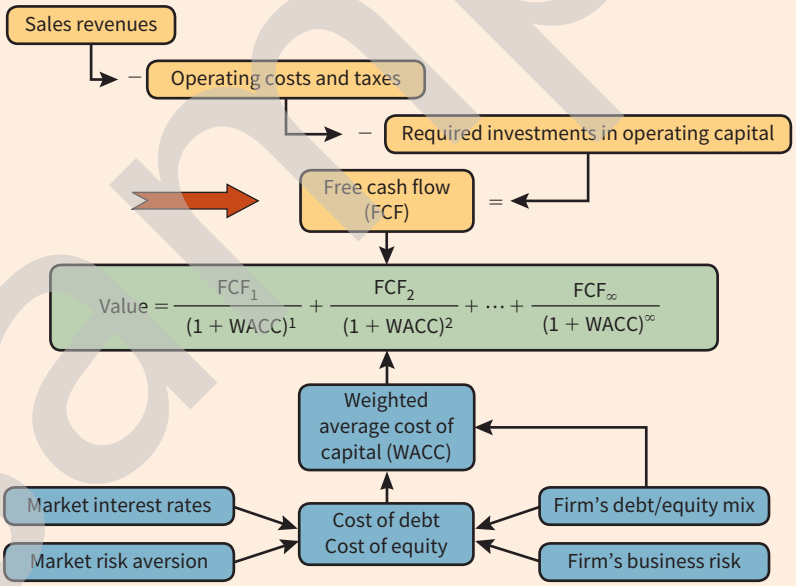
Apple generated an operating cash flow of almost $64 billion in 2017! The ability to generate cash flow is the lifeblood of a company and the basis for its fundamental value. How did Apple use this cash flow? It returned over $46 billion to stockholders by paying $13 billion in dividends and by repurchasing $33 billion of its own stock.

Many other companies also reported large cash flows, but they used the money differently. For example, Google generated over $36 billion but returned relatively little to stockholders, paying no dividends and repurchasing only $4 billion of its stock. Instead, Google spent $10 billion on capital expenditures (mostly technology infrastructure). Google also put about $18 billion into short-term investments (such as Treasury securities), saving for a rainy day.

These well-managed companies used their operating cash flows in different ways, including capital expenditures, acquisitions, dividend payments, stock repurchases, and saving for future needs. Which company made the right choices? Only time will tell, but keep these companies and their different cash flow strategies in mind as you read this chapter.

Intrinsic Value, Free Cash Flow, and Financial Statements

In Chapter 1, we told you that managers should strive to make their firms more valuable and that a firm's intrinsic value is determined by the present value of its free cash flows (FCFs) discounted at the weighted average cost of capital (WACC). This chapter focuses on FCF, including its calculation from financial statements and its interpretation when evaluating a company and manager.



resource

The textbook's Web site contains an Excel *file that will guide you through the chapter's calculations. The file for this chapter is* **Ch02 Tool Kit.xlsx**, *and we encourage you to open the file and follow along as you read the chapter.*

The stream of cash flows a firm is expected to generate in the future determines its fundamental value (also called intrinsic value). But how does an investor go about estimating future cash flows, and how does a manager decide which actions are most likely to increase cash flows? The first step is to understand the financial statements that publicly traded firms must provide to the public. Thus, we begin with a discussion of financial statements, including how to interpret them and how to use them. Value depends on *after-tax cash flows*, so we provide an overview of the federal income tax system and highlight differences between accounting income and cash flow.

www

See the Securities and Exchange Commission's (SEC) Web site for quarterly reports and more detailed annual reports that provide breakdowns for each major division or subsidiary. These reports, called 10-Q *and* 10-K reports, *are available on the SEC's Web site at* **www.sec.gov** *under the heading "EDGAR." Once there, you can search by stock ticker symbol.*

2-1 Financial Statements and Reports

A company's **annual report** usually begins with the chairperson's description of the firm's operating results during the past year and a discussion of new developments that will affect future operations. The annual report also presents four basic financial statements—the *balance sheet,* the *income statement,* the *statement of stockholders' equity,* and the *statement of cash flows.*

The quantitative and qualitative written materials are equally important. The financial statements report *what has actually happened* to assets, earnings, dividends, and cash flows during the past few years, whereas the written materials attempt to explain why things turned out the way they did.

SELF-TEST

What is the annual report, and what two types of information does it present?

What four types of financial statements does the annual report typically include?

2-2 The Balance Sheet

resource
See **Ch02 Tool Kit.xlsx** *for details.*

For illustrative purposes, we use a hypothetical company, MicroDrive, Inc., which produces memory components for computers and smartphones. Figure 2-1 shows MicroDrive's most recent **balance sheets**, which represent "snapshots" of its financial position on the last day of each year. Although most companies report their balance sheets only on the last day of a given period, the "snapshot" actually changes daily as inventories are bought and sold, as fixed assets are added or retired, or as loan balances are increased or paid down. Moreover, a retailer will have larger inventories before Christmas than later in the spring, so balance sheets for the same company can look quite different at different times during the year. The following sections explain the accounts shown in Figure 2-1.

The balance sheet begins with assets, which are the "things" the company owns. Assets are listed in order of *liquidity*, or length of time it typically takes to convert them to cash at fair market values. The balance sheet also lists the claims that various groups have against the company's value; these are listed in the order in which they must be paid. For example, suppliers may have claims called *accounts payable* that are due within 30 days, banks may have claims called *notes payable* that are due within 90 days, and bondholders may have claims that are not due for 20 years or more.

Stockholders' claims represent ownership (or equity) and need never be "paid off." These are residual claims in the sense that stockholders may receive payments only if there is value remaining after other claimants have been paid. The nonstockholder claims are

FIGURE 2-1
MicroDrive, Inc.: December 31 Balance Sheets (Millions of Dollars)

	A	B	C	D	E	F	G
26	**MicroDrive Inc. December 31 Balance Sheets**						
27	**(Millions of Dollars)**						
28	***Assets***					**2019**	**2018**
29	**Cash and equivalents**					**$100**	**$102**
30	**Short-term investments**					**10**	**40**
31	**Accounts receivable**					**500**	**384**
32	**Inventories**					**1,000**	**774**
33	**Total current assets**					**$1,610**	**$1,300**
34	**Net property, plant, and equipment (PP&E)**					**2,000**	**1,780**
35	**Total assets**					**$3,610**	**$3,080**
36							
37	***Liabilities and Equity***						
38	**Accounts payable**					**$200**	**$180**
39	**Notes payable**					**150**	**28**
40	**Accruals**					**400**	**370**
41	**Total current liabilities**					**$750**	**$578**
42	**Long-term bonds**					**520**	**350**
43	**Total liabilities**					**$1,270**	**$928**
44	**Preferred stock (1,000,000 shares)**					**100**	**100**
45	**Common stock (50,000,000 shares)**					**500**	**500**
46	**Retained earnings**					**1,740**	**1,552**
47	**Total common equity**					**$2,240**	**$2,052**
48	**Total liabilities and equity**					**$3,610**	**$3,080**
49							

Source: See the file ***Ch02 Tool Kit.xlsx***. Numbers are reported as rounded values for clarity but are calculated using *Excel*'s full precision. Thus, intermediate calculations using the figure's rounded values may be inexact.

liabilities from the stockholders' perspective. The amounts shown on the balance sheets are called **book values** because they are based on the amounts recorded by bookkeepers when assets are purchased or liabilities are issued. As you will see throughout this textbook, book values may be very different from **market values**, which are the current values as determined in the marketplace.

The following sections provide more information about specific asset, liability, and equity accounts.

2-2a Assets

Cash, short-term investments, accounts receivable, and inventories are listed as current assets because MicroDrive is expected to convert them into cash within a year. All assets are stated in dollars, but only cash represents actual money that can be spent. Some **marketable securities** mature very soon, and these can be converted quickly into cash at prices close to their book values. Such securities are called *cash equivalents* and are included with cash. Therefore, MicroDrive could write checks for a total of $100 million. Other types of marketable securities have a longer time until maturity (but still less than a year). Their market values are less predictable, so they are not included in cash or cash equivalents.

Because it is helpful in financial analysis, MicroDrive's accountants are careful to separately identify the cash used in daily operations and the cash that is held for other purposes. For example, MicroDrive continuously deposits checks from customers and writes checks to suppliers, employees, and so on. Because inflows and outflows do not coincide perfectly, MicroDrive must keep some cash in its bank account. In other words, MicroDrive must have some cash on hand to conduct operations, which is the $100 million in cash reported in Figure 2-1.

MicroDrive reports the total of any other cash, cash equivalents, and marketable securities that are not used to support operation in a separate account called short-term investments. For example, Figure 2-1 shows that MicroDrive has $10 million of short-term investments.

We will always distinguish between the cash that is used to support operations and the cash, cash equivalents, and marketable securities that are held for other purposes. However, be alert when looking at the financial statements from sources outside our book because they don't always separately identify the cash used to support operations.

When MicroDrive sells its products to customers but doesn't demand immediate payment, the customers then have obligations to make the payment, which MicroDrive reports as **accounts receivable**. The $500 million shown in accounts receivable is the amount of sales for which MicroDrive has not yet been paid.

Figure 2-1 reports inventories of $1,000 million, which is the amount that MicroDrive has tied up in raw materials, work-in-process, and finished goods available for sale. MicroDrive uses the **FIFO (first-in, first-out)** inventory accounting method to estimate production costs and the value of remaining inventory. The FIFO method assumes, for accounting purposes only, that the first items placed in inventory are the first ones used in production. In contrast, the **LIFO (last-in, first-out)** method assumes that the items most recently placed in inventory are the first ones used in production. (No matter which method a company chooses for accounting purposes, the company actually can use inventory in any order it wishes.)

During an inflationary period of rising prices, older purchases of materials have lower costs than newer purchases. This means that FIFO will report lower costs of goods sold on the income statement than LIFO (because FIFO assumes that the older items are used first) but will report higher values for remaining inventory on the balance sheet. Because MicroDrive uses FIFO and because inflation has been occurring: (1) Its balance sheet inventories

are higher than they would have been had it used LIFO. (2) Its cost of goods sold is lower than it would have been under LIFO. (3) Its reported profits are therefore higher. Thus, the inventory valuation method can have a significant effect on financial statements, which is important to know when comparing companies that use different methods.

Rather than treat the entire purchase price of a long-term asset (such as a factory, plant, or equipment) as an expense in the purchase year, accountants "spread" the purchase cost over the asset's useful life. The amount they charge each year is called the **depreciation expense**. Some companies report an amount called *gross plant and equipment*, which is the total cost of the long-term assets they have in place, and another amount called *accumulated depreciation*, which is the total amount of depreciation that has been charged on those assets. Some companies, such as MicroDrive, report only net plant and equipment, which is gross plant and equipment less accumulated depreciation. Chapter 11 provides a more detailed explanation of depreciation methods.

2-2b Liabilities and Equity

Accounts payable, notes payable, and accruals are listed as current liabilities because MicroDrive is expected to pay them within a year. When MicroDrive purchases supplies but doesn't immediately pay for them, it takes on obligations called **accounts payable**. Similarly, when MicroDrive takes out a loan that must be repaid within a year, it signs an IOU called a *note payable*.

Most companies use the Accrual Accounting Method, which attempts to match revenues to the periods in which they are earned and expenses to the periods in which the effort to generate income occurred. For example, companies don't pay employees' wages daily, and the amount owed on these items at any point in time usually is reported as a current liability in an account such as "Accrued Wages Payable." Most companies have more than one type of accrued liability, but we combine all such accruals into a single account for MicroDrive to avoid unnecessary complexity. Section 2-5 explains how accruals affect cash flows.

Long-term bonds are also liabilities because they reflect a claim held by someone other than a stockholder. They are not reported as a current liability because the maturity date is more than one year away.

Preferred stock is a hybrid, or a cross between common stock and debt. In the event of bankruptcy, preferred stock ranks below debt but above common stock. Also, the preferred dividend is fixed, so preferred stockholders do not benefit if the company's earnings grow. Most firms do not use much, if any, preferred stock, so "equity" usually means "common equity" unless the words "total" or "preferred" are included.

When a company sells shares of stock, it records the proceeds in the **common stock account**.[1] **Retained earnings** are the cumulative amount of earnings that have not been paid out as dividends. The sum of common stock and retained earnings is called **common equity**, or just *equity*. If a company could actually sell its assets at their book value, and if the liabilities and preferred stock were actually worth their book values, then a company could sell its assets, pay off its liabilities and preferred stock, and the remaining cash would belong to common stockholders. Therefore, common equity is sometimes called the **net worth of shareholders**—it's the assets minus (or "net of") the liabilities and preferred stock.

[1]Companies sometimes break the total proceeds into two parts: **par value** and **paid-in capital** (or capital surplus). For example, if a company sells shares of stock for $10, it might record $1 of par and $9 of paid-in capital. For most purposes, the distinction between par and paid-in capital is not important, and most companies now use no-par stock.

Let's Play Hide-and-Seek!

In a shameful lapse of regulatory accountability, banks and other financial institutions were allowed to use so-called structured investment vehicles (SIVs) to hide assets and liabilities and simply not report them on their balance sheets. Here's how SIVs worked and why they subsequently failed. The SIV was set up as a separate legal entity that the bank owned and managed. The SIV would borrow money in the short-term market (backed by the credit of the bank) and then invest in long-term securities. As you might guess, many SIVs invested in mortgage-backed securities. When the SIV paid only 3% on its borrowings but earned 10% on its investments, the managing bank was able to report fabulous earnings, especially if it also earned fees for creating the mortgage-backed securities that went into the SIV.

But this game of hide-and-seek didn't have a happy ending. Mortgage-backed securities began defaulting in 2007 and 2008, causing the SIVs to pass losses through to the banks. SunTrust, Citigroup, Bank of America, and Northern Rock are just a few of the many banks that reported enormous losses in the SIV game. Investors, depositors, and the government eventually found the hidden assets and liabilities, but by then the assets were worth a lot less than the liabilities.

In a case of too little and too late, regulators have closed many of these loopholes, and it doesn't look like there will be any more hidden SIVs in the near future. But the damage has been done, and the entire financial system was put at risk in large part because of this high-stakes game of hide-and-seek.

SELF-TEST

What is the balance sheet, and what information does it provide?

What determines the order of the information shown on the balance sheet?

Why might a company's December 31 balance sheet differ from its June 30 balance sheet?

A firm has $8 million in total assets. It has $3 million in current liabilities, $2 million in long-term debt, and $1 million in preferred stock. What is the reported net worth of shareholders (i.e., the reported common equity)? **($2 million)**

2-3 The Income Statement

resource

See **Ch02 Tool Kit.xlsx** *for details.*

Figure 2-2 shows the **income statements** and selected additional information for MicroDrive. Income statements can cover any period of time, but they are usually prepared monthly, quarterly, and annually. Unlike the balance sheet, which is a snapshot of a firm at a point in time, the income statement reflects performance during the period. The following sections explain the components of an income statement.

Net sales are the revenues less any discounts or returns. Depreciation and amortization reflect the estimated costs of the assets that wear out in producing goods and services. To illustrate depreciation, suppose that in 2019 MicroDrive purchased a $100,000 machine with a life of 5 years and zero expected salvage value. This $100,000 cost is not expensed in the purchase year but is instead spread out over the machine's 5-year depreciable life.[2] In straight-line depreciation, which we explain in Chapter 11, the depreciation charge for a full year would be $100,000/5 = $20,000. The reported depreciation expense on the income statement is the sum of all the assets' annual depreciation charges.

Depreciation applies to tangible assets, such as plant and equipment, whereas an **amortization expense** applies to intangible assets. For example, if a company acquires another company but pays more than the tangible assets, then the difference is

[2]Congress occasionally changes the tax laws regarding depreciation and did so again with the 2017 Tax Cut and Jobs Act. We discuss many of the TCJA's features later in this chapter. See Chapter 11 for a more detailed discussion of depreciation for tax purposes.

FIGURE 2-2
MicroDrive Income Statements (and Selected Additional Information) for Years Ending December 31 (Millions, Except for Per Share Data)

	A	B	C	D	E	F	G
56						2019	2018
57	Net sales					$5,000	$4,800
58	Costs of goods sold except depreciation					3,900	3,710
59	Depreciation and amortization[a]					200	180
60	Other operating expenses					500	470
61	Earnings before interest and taxes (EBIT)					$400	$440
62	Less interest					60	40
63	Pre-tax earnings					$340	$400
64	Taxes					85	100
65	Net Income before preferred dividends					$255	$300
66	Preferred dividends					7	7
67	Net Income available to common stockholders					$248	$293
68							
69	*Additional Information*						
70	Common dividends					$60.0	$59.4
71	Addition to retained earnings					$188.0	$233.6
72	Number of common shares					60	60
73	Stock price per share					$31.00	$45.00
74							
75	*Per Share Data*						
76	Earnings per share, EPS[b]					$4.13	$4.88
77	Dividends per share, DPS[c]					$1.00	$0.99
78	Book value per share, BVPS[d]					$37.33	$34.20

Source: See the file ***Ch02 Tool Kit.xlsx***. Numbers are reported as rounded values for clarity but are calculated using *Excel*'s full precision. Thus, intermediate calculations using the figure's rounded values may be inexact.

Notes:

[a]MicroDrive has no amortization charges.

$$^{b}\text{EPS} = \frac{\text{Net income available to common stockholders}}{\text{Common shares outstanding}}$$

$$^{c}\text{DPS} = \frac{\text{Dividends paid to common stockholders}}{\text{Common shares outstanding}}$$

$$^{d}\text{BVPS} = \frac{\text{Total common equity}}{\text{Common shares outstanding}}$$

called **goodwill**.[3] Other intangible assets include patents, copyrights, trademarks, and similar items. MicroDrive has no amortization charges.

The **cost of goods sold (COGS)** includes labor, raw materials, and other expenses directly related to the production or purchase of the items or services sold in that period. As reported in most financial statements, the COGS includes depreciation because accounting logic defines depreciation as the cost of assets wearing out by producing goods. In contrast, we report depreciation separately so that analysis later in the chapter will be more transparent.

[3]The accounting treatment of goodwill resulting from mergers has changed in recent years. Rather than an annual charge, companies are required to periodically evaluate the value of goodwill and reduce net income only if the goodwill's value has decreased materially ("become impaired," in the language of accountants). For example, in 2002 AOL Time Warner wrote off almost $100 billion associated with the AOL merger. It doesn't take too many $100 billion expenses to really hurt net income!

A Matter of Opinion

Investors need to be cautious when they review financial statements. Although companies are required to follow generally accepted accounting principles (GAAP), managers still use a lot of discretion in deciding how and when to report certain transactions. Consequently, two firms in the same operating situation may report financial statements that convey different impressions about their financial strength. Some variations may stem from legitimate differences of opinion about the correct way to record transactions. In other cases, managers may choose to report numbers in a way that helps them present either higher earnings in the current year or more stable earnings over time. As long as they follow GAAP, such actions are not illegal, but these differences make it harder for investors to compare companies and gauge their true performances.

Subtracting COGS (including depreciation) and other operating expenses results in **earnings before interest and taxes (EBIT)**. Many analysts add back depreciation to EBIT to calculate **EBITDA**, which stands for earnings before interest, taxes, depreciation, and amortization. Because neither depreciation nor amortization is paid in cash, some analysts claim that EBITDA is a better measure of financial strength than is net income. MicroDrive's EBITDA is:

$$\text{EBITDA} = \text{EBIT} + \text{Depreciation} \tag{2-1}$$

$$= \$400 + \$200 = \$600 \text{ million}$$

Alternatively, EBITDA's calculation can begin with sales:

$$\text{EBITDA} = \text{Sales} - \text{COGS excluding depreciation} - \text{Other expenses} \tag{2-2}$$

$$= \$5{,}000 - \$3{,}900 - \$500 = \$600 \text{ million}$$

However, as we show later in the chapter, EBITDA is not as useful to managers and analysts as free cash flow, so we usually focus on free cash flow instead of EBITDA.

Subtracting interest expense from EBIT results in **pre-tax income**, which is also called **earning before tax (EBT)**, or **taxable income**. The net income available to common shareholders, which equals revenues less expenses, taxes, and preferred dividends (but before paying common dividends), is generally referred to as **net income**. Net income is also called **accounting income, accounting profit**, **earnings**, or **profit**, particularly in financial news reports. Dividing net income by the number of shares outstanding gives earnings per share (EPS), often called the *bottom line*. Throughout this book, unless otherwise indicated, net income means net income available to common stockholders.[4]

[4]Companies also report "comprehensive income," which is the sum of net income and any "comprehensive" income item, such as the change in market value of a financial asset. For example, a decline in a financial asset's value would be recorded as a loss even though the asset has not been sold. We assume that there are no comprehensive income items in our examples.

Some companies also choose to report "pro forma income." For example, if a company incurs an expense that it doesn't expect to recur, such as the closing of a plant, it might calculate pro forma income as though it had not incurred the one-time expense. There are no hard-and-fast rules for calculating pro forma income, so many companies find ingenious ways to make pro forma income higher than traditional income. The SEC and the Public Company Accounting Oversight Board (PCAOB) are taking steps to reduce deceptive uses of pro forma reporting.

SELF-TEST

What is an income statement, and what information does it provide?

What is often called the "bottom line"?

What is EBITDA?

How does the income statement differ from the balance sheet with regard to the time period reported?

A firm has the following information: $2 million in earnings before taxes. The firm has an, interest expense of $300,000 and depreciation of $200,000; it has no amortization. What is its EBITDA? **($2.5 million)**

Now suppose a firm has the following information: $7 million in sales, $4 million of costs of goods sold excluding depreciation and amortization, and $500,000 of other operating expenses. What is its EBITDA? **($2.5 million)**

2-4 Statement of Stockholders' Equity

resource
See **Ch02 Tool Kit.xlsx** *for details.*

Changes in stockholders' equity during the accounting period are reported in the **statement of stockholders' equity**. Figure 2-3 shows that MicroDrive earned $248 million during 2019 and paid out $60 million in common dividends. This means that MicroDrive plowed $188 million back into the business: $248 − $60 = $188. Thus, the balance sheet item "Retained earnings" increased from $1,552 million at year-end 2018 to $1740 million at year-end 2019.[5] The last column shows the beginning stockholders' equity, any changes, and the end-of-year stockholders' equity.

Note that "Retained earnings" is not a pile of money just waiting to be used; it does not represent assets but is instead a *claim against assets*. In 2019, MicroDrive's

FIGURE 2-3
MicroDrive, Inc.: Statement of Stockholders' Equity for Years Ending December 31 (Millions of Dollars and Millions of Shares)

	A	B	C	D	E	F	G	H
99				**Preferred**	**Common**	**Common**	**Retained**	**Total**
100				**Stock**	**Shares**	**Stock**	**Earnings**	**Equity**
101	**Balances, Dec. 31, 2018**			**$100**	**60**	**$500**	**$1,552**	**$2,152**
102	**Changes during year:**							
103	**Net income**						**$248**	**$248**
104	**Cash dividends**						**(60)**	**(60)**
105	**Issuance/repurchase of stock**			**0**	**0**	**0**		
106	**Balances, Dec. 31, 2019**			**$100**	**60**	**$500**	**$1,740**	**$2,340**

Source: See the file ***Ch02 Tool Kit.xlsx***. Numbers are reported as rounded values for clarity but are calculated using *Excel*'s full precision. Thus, intermediate calculations using the figure's rounded values may be inexact.
Note: In financial statements, parentheses and red colors denote a negative number.

[5]A more complicated company might require additional columns and rows to report information regarding new issues of stock, treasury stock acquired or reissued, stock options exercised, and unrealized foreign exchange gains or losses.

Financial Analysis on the Web

A wide range of valuable financial information is available on the Web. With just a couple of clicks, an investor can easily find the key financial statements for most publicly traded companies. Here's a partial (by no means complete) list of places you can go to get started.

- Try Yahoo! Finance's Web site, **http://finance.yahoo.com.** Here you will find updated market information along with links to a variety of interesting research sites. Enter a stock's ticker symbol, click Search and select the company, and you will see the stock's current price along with recent news about the company. The panel at the top has links to key statistics and to the company's income statement, balance sheet, statement of cash flows, and more. The Web site also has a list of insider transactions, so you can tell if a company's CEO and other key insiders are buying or selling their company's stock. In addition, there is a message board where investors share opinions about

stockholders allowed it to reinvest $188 million ($248 net income − $60 million dividends) instead of distributing the money as dividends—the "retained earnings of $188 million was spent on new assets. Thus, retained earnings, as reported on the balance sheet, does not represent cash and is not "available" for the payment of dividends or anything else.[6]

SELF-TEST

What is the statement of stockholders' equity, and what information does it provide?

Why do changes in retained earnings occur?

Explain why the following statement is true: "The retained earnings account, as reported on the balance sheet, does not represent cash and is not available for the payment of dividends or anything else."

A firm had a retained earnings balance of $3 million in the previous year. In the current year, its net income is $2.5 million. If it pays $1 million in common dividends in the current year, what is its resulting retained earnings balance? **($4.5 million)**

2-5 Statement of Cash Flows

Even if a company reports a large net income during a year, the *amount of cash* reported on its year-end balance sheet may be the same or even lower than its beginning cash. The reason is that the company can use its net income in a variety of ways, not just keep it as cash in the bank. For example, the firm may use its net income to pay dividends, to increase inventories, to finance accounts receivable, to invest in fixed

[6]The amount reported in the retained earnings account is not an indication of the amount of cash the firm has. Cash (as of the balance sheet date) is found in the cash account, an asset account. A positive number in the retained earnings account indicates only that the firm earned some income in the past, but its dividends paid were less than its earnings. Even if a company reports record earnings and shows an increase in its retained earnings account, it still may be short of cash.

The same situation holds for individuals. You might own a new BMW (no loan), lots of clothes, and an expensive stereo and hence have a high net worth. But if you have only 23 cents in your pocket plus $5 in your checking account, you will still be short of cash.