



corporate finance | 11e

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Corporate Finance

The McGraw-Hill/Irwin Series in Finance, Insurance, and Real Estate

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Corporate Finance

ELEVENTH EDITION

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CORPORATE FINANCE, ELEVENTH EDITION

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This book is printed on acid-free paper.

1 2 3 4 5 6 7 8 9 0 DOW/DOW 1 0 9 8 7 6 5

ISBN 978-0-07-786175-9

MHID 0-07-786175-2

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Cover Image: *Getty Images/Jon-Pierre Kelani / EyeEm*

Compositor: *MPS Limited, A Macmillan Company*

Printer: *R. R. Donnelley*

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Library of Congress Cataloging-in-Publication Data

Ross, Stephen A.

Corporate finance / Stephen A. Ross, Sloan School of Management, Massachusetts Institute of Technology, Randolph W. Westerfield, Marshall School of Business, University of Southern California, Jeffrey Jaffe, Wharton School of Business, University of Pennsylvania, Bradford D. Jordan, Gatton College of Business and Economics, University of Kentucky.—Eleventh Edition. pages cm.—(Corporate finance)

Revised edition of Corporate finance, 2013. ISBN 978-0-07-786175-9 (alk. paper)

I. Corporations—Finance. I. Westerfield, Randolph. II. Jaffe, Jeffrey F., 1946- III. Title.

HG4026.R675 2016

658.15—dc23

2015028977

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To our family and friends
with love and gratitude.



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Preface

The teaching and the practice of corporate finance are more challenging and exciting than ever before. The last decade has seen fundamental changes in financial markets and financial instruments. In the early years of the 21st century, we still see announcements in the financial press about takeovers, junk bonds, financial restructuring, initial public offerings, bankruptcies, and derivatives. In addition, there are the new recognitions of “real” options, private equity and venture capital, subprime mortgages, bailouts, and credit spreads. As we have learned in the recent global credit crisis and stock market collapse, the world’s financial markets are more integrated than ever before. Both the theory and practice of corporate finance have been moving ahead with uncommon speed, and our teaching must keep pace.

These developments have placed new burdens on the teaching of corporate finance. On one hand, the changing world of finance makes it more difficult to keep materials up to date. On the other hand, the teacher must distinguish the permanent from the temporary and avoid the temptation to follow fads. Our solution to this problem is to emphasize the modern fundamentals of the theory of finance and make the theory come to life with contemporary examples. Increasingly, many of these examples are outside the United States.

All too often the beginning student views corporate finance as a collection of unrelated topics that are unified largely because they are bound together between the covers of one book. We want our book to embody and reflect the main principle of finance: Namely, that good financial decisions will add value to the firm and to shareholders and bad financial decisions will destroy value. The key to understanding how value is added or destroyed is cash flows. To add value, firms must generate more cash than they use. We hope this simple principle is manifest in all parts of this book.

The Intended Audience of This Book

This book has been written for the introductory courses in corporate finance at the MBA level and for the intermediate courses in many undergraduate programs. Some instructors will find our text appropriate for the introductory course at the undergraduate level as well.

We assume that most students either will have taken, or will be concurrently enrolled in, courses in accounting, statistics, and economics. This exposure will help students understand some of the more difficult material. However, the book is self-contained, and a prior knowledge of these areas is not essential. The only mathematics prerequisite is basic algebra.

New to Eleventh Edition

Each chapter has been updated and where relevant, “internationalized.” We try to capture the excitement of corporate finance with current examples, chapter vignettes, and openers. Spreadsheets applications are spread throughout.

- **CHAPTER 2** has been rewritten to better highlight the notion of cash flow and how it contrasts with accounting income.
- **CHAPTER 6** has been reorganized to better emphasize some special cases of capital budgeting including cost cutting proposals and investments of unequal lives.
- **CHAPTER 9** has updated the many new ways of stock market trading.
- **CHAPTER 10** has updated material on historical risk and return and better motivated the equity risk premium.
- **CHAPTER 13** has sharpened the discussion of how to use the CAPM for the cost of equity and WACC.
- **CHAPTER 14** has updated and added to the discussion of behavioral finance and its challenge to the efficient market hypothesis.
- **CHAPTER 15** expands on its description of equity and debt and has new material on the value of a call provision as well as the differences between book and market values.
- **CHAPTER 19 AND 20** continue to build on the notion of a financial life cycle where capital structure decisions are driven by the varying needs for internal and external finance over a firm's life.

Pedagogy

In this edition of *Corporate Finance*, we have updated and improved our features to present material in a way that makes it coherent and easy to understand. In addition, *Corporate Finance* is rich in valuable learning tools and support, to help students succeed in learning the fundamentals of financial management.

Chapter Opening Vignettes

Each chapter begins with a contemporary vignette that highlights the concepts in the chapter and their relevance to real-world examples.

10

PART III: RISK

Risk and Return

LESSONS FROM MARKET HISTORY

With the S&P 500 Index returning about 14 percent and the NASDAQ Composite Index up about 13 percent in 2014, stock market performance overall was very good. In particular, investors in outpatient diagnostic imaging services company RadNet, Inc., had to be happy about the 411 percent gain in that stock, and investors in biopharmaceutical company Achillion Pharmaceuticals had to feel pretty good following that company's 269 percent gain. Of course, not all stocks increased in value during the year. Stock in Transocean Ltd. fell 63 percent during the year, and stock in Avon Products dropped 44 percent.

These examples show that there were tremendous potential profits to be made during 2014, but there was also the risk of losing money—and lots of it. So what should you, as a stock market investor, expect when you invest your own money? In this chapter, we study more than eight decades of market history to find out.

10.1 Returns

DOLLAR RETURNS

Suppose the Video Concept Company has several thousand shares of stock outstanding and you are a shareholder. Further suppose that you purchased some of the shares of stock in the company at the beginning of the year; it is now year-end and you want to figure out how well you have done on your investment. The return you get on an investment in stocks, like that in bonds or any other investment, comes in two forms.

As the owner of stock in the Video Concept Company, you are a part owner of the company. If the company is profitable, it generally could distribute some of its profits to the shareholders. Therefore, as the owner of shares of stock, you could receive some cash, called a *dividend*, during the year. This cash is the *income component* of your return. In addition to the dividends, the other part of your return is the *capital gain*—or, if it is negative, the *capital loss* (negative capital gain)—on the investment.

For example, suppose we are considering the cash flows of the investment in Figure 10.1, showing that you purchased 100 shares of stock at the beginning of the year at a price of \$37 per share. Your total investment, then, was:

$$C_0 = \$37 \times 100 = \$3,700$$

ExcelMaster coverage online

How did the market do today? Find out at finance.yahoo.com.

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ExcelMaster Icons

Topics covered in the comprehensive ExcelMaster supplement (in Connect Finance) are indicated by an icon in the margin.

EXAMPLE 6.5

Allocated Costs The Vestmann Consulting Corp. denotes one wing of its suite of offices to a library requiring a cash outflow of \$100,000 a year in upkeep. A proposed capital budgeting project is expected to generate revenue equal to 5 percent of the overall firm's sales. An executive at the firm, David Petersen, argues that \$5,000 (= 5 percent \times \$100,000) should be viewed as the proposed project's share of the library's costs. Is this appropriate for capital budgeting?

The answer is no. One must ask what the difference is between the cash flows of the entire firm with the project and the cash flows of the entire firm without the project. The firm will spend \$100,000 on library upkeep whether or not the proposed project is accepted. Because acceptance of the proposed project does not affect this cash flow, the cash flow should be ignored when calculating the NPV of the project. For example, suppose the project has a positive NPV without the allocated costs but is rejected because of the allocated costs. In this case, the firm is losing potential value that it could have gained otherwise.

6.2 The Baldwin Company: An Example

We next consider the example of a proposed investment in machinery and related items. Our example involves the Baldwin Company and colored bowling balls.

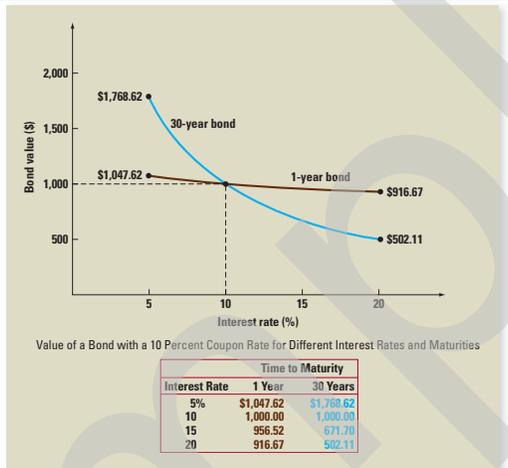
The Baldwin Company, originally established 16 years ago to make footballs, is now a leading producer of tennis balls, baseballs, footballs, and golf balls. Nine years ago, the company introduced "High Flite," its first line of high-performance golf balls. Baldwin management has sought opportunities in whatever businesses seem to have some potential for cash flow. Recently W. C. Meadows, vice president of the Baldwin Company, identified another segment of the sports ball market that looked promising and that he felt was not adequately served by larger manufacturers. That market was for brightly colored bowling balls, and he believed many bowlers valued appearance and style above performance. He also believed that it would be difficult for competitors to take advantage of the opportunity because of both Baldwin's cost advantages and its highly developed marketing skills.

As a result, the Baldwin Company investigated the marketing potential of brightly colored bowling balls. Baldwin sent a questionnaire to consumers in three markets: Philadelphia, Los Angeles, and New Haven. The results of the three questionnaires were much better than expected and supported the conclusion that the brightly colored bowling balls could achieve a 10 to 15 percent share of the market. Of course, some people at Baldwin complained about the cost of the test marketing, which was \$250,000. (As we shall see later, this is a sunk cost and should not be included in project evaluation.)

In any case, the Baldwin Company is now considering investing in a machine to produce bowling balls. The bowling balls would be manufactured in a building owned by the firm and located near Los Angeles. This building, which is vacant, and the land can be sold for \$150,000 after taxes.

Working with his staff, Meadows is preparing an analysis of the proposed new product. He summarizes his assumptions as follows: The cost of the bowling ball machine is

Figure 8.2
Interest Rate Risk and
Time to Maturity



us that a relatively small change in interest rates will lead to a substantial change in the bond's value. In comparison, the one-year bond's price is relatively insensitive to interest rate changes.

Intuitively, shorter-term bonds have less interest rate sensitivity because the \$1,000 face amount is received so quickly. For example, the present value of this amount isn't greatly affected by a small change in interest rates if the amount is received in, say, one year. However, even a small change in the interest rate, once compounded for, say, 30 years, can have a significant effect on present value. As a result, the present value of

Figures and Tables

This text makes extensive use of real data and presents them in various figures and tables. Explanations in the narrative, examples, and end-of-chapter problems will refer to many of these exhibits.

Examples

Separate called-out examples are integrated throughout the chapters. Each example illustrates an intuitive or mathematical application in a step-by-step format. There is enough detail in the explanations so students don't have to look elsewhere for additional information.

EXAMPLE 9.5

Calculating the Required Return Pagemaster Enterprises, the company examined in Example 9.4, has 1,000,000 shares of stock outstanding. The stock is selling at \$10. What is the required return on the stock?

The payout ratio is the ratio of dividends/earnings. Because Pagemaster's retention ratio is 40 percent, the payout ratio, which is $1 - \text{Retention ratio}$, is 60 percent. Recall both that Pagemaster just reported earnings of \$2,000,000 and that the firm's growth rate is .064.

Earnings a year from now will be \$2,128,000 ($= \$2,000,000 \times 1.064$), implying that dividends will be \$1,276,800 ($= .60 \times \$2,128,000$). Dividends per share will be \$1.28 ($= \$1,276,800 / 1,000,000$). Given that $g = .064$, we calculate R from (9.9) as follows:

$$.192 = \frac{\$1.28}{\$10.00} + .064$$

In Their Own Words

ROBERT C. HIGGINS ON SUSTAINABLE GROWTH

Most financial officers know intuitively that it takes money to make money. Rapid sales growth requires increased assets in the form of accounts receivable, inventory, and fixed plant, which, in turn, require money to pay for assets. They also know that if their company does not have the money when needed, it can literally "grow broke." The sustainable growth equation states these intuitive truths explicitly.

Sustainable growth is often used by bankers and other external analysts to assess a company's creditworthiness. They are aided in this exercise by several sophisticated computer software packages that provide detailed analyses of the company's past financial performance, including its annual sustainable growth rate.

Bankers use this information in several ways. Quick comparison of a company's actual growth rate to its sustainable rate tells the banker what issues will be at the top of management's financial agenda. If actual growth consistently exceeds sustainable growth, management's problem will be where to get the cash to finance growth. The banker thus can anticipate interest in loan products. Conversely, if sustainable growth consistently exceeds actual, the banker had best be prepared to talk about

investment products because management's problem will be what to do with all the cash that keeps piling up in the till.

Bankers also find the sustainable growth equation useful for explaining to financially inexperienced small business owners and overly optimistic entrepreneurs that, for the long-run viability of their business, it is necessary to keep growth and profitability in proper balance.

Finally, comparison of actual to sustainable growth rates helps a banker understand why a loan applicant needs money and for how long the need might continue. In one instance, a loan applicant requested \$100,000 to pay off several insistent suppliers and promised to repay in a few months when he collected some accounts receivable that were coming due. A sustainable growth analysis revealed that the firm had been growing at four to six times its sustainable growth rate and that this pattern was likely to continue in the foreseeable future. This alerted the banker that impatient suppliers were only a symptom of the much more fundamental disease of overly rapid growth, and that a \$100,000 loan would likely prove to be only the down payment on a much larger, multiyear commitment.

SOURCE: Robert C. Higgins is Professor of Finance at the University of Washington. He pioneered the use of sustainable growth as a tool for financial analysis.

"In Their Own Words" Boxes

Located throughout the chapters, this unique series consists of articles written by distinguished scholars or practitioners about key topics in the text. Boxes include essays by Edward I. Altman, Robert S. Hansen, Robert C. Higgins, Michael C. Jensen, Merton Miller, and Jay R. Ritter.

Spreadsheet Applications

Now integrated into select chapters, Spreadsheet Applications boxes reintroduce students to Excel, demonstrating how to set up spreadsheets in order to analyze common financial problems—a vital part of every business student’s education. (For even more spreadsheet example problems, check out ExcelMaster in Connect Finance).

SPREADSHEET APPLICATIONS

Using a Spreadsheet for Time Value of Money Calculations

More and more, businesspeople from many different areas (not just finance and accounting) rely on spreadsheets to do all the different types of calculations that come up in the real world. As a result, in this section, we will show you how to use a spreadsheet to handle the various time value of money problems we present in this chapter. We will use Microsoft Excel™, but the commands are similar for other types of software. We assume you are already familiar with basic spreadsheet operations.

As we have seen, you can solve for any one of the following four potential unknowns: future value, present value, the discount rate, or the number of periods. With a spreadsheet, there is a separate formula for each. In Excel, these are shown in a nearby box.

In these formulas, *pv* and *fv* are present and future value, *nper* is the number of periods, and *rate* is the discount, or interest, rate.

Two things are a little tricky here. First, unlike a financial calculator, the spreadsheet requires that the rate be entered as a decimal. Second, as with most financial calculators, you have to put a negative sign on either the present value or the future value to solve for the rate or the number of periods. For the same reason, if you solve for a present value, the answer will have a negative sign unless you input a negative future value. The same is true when you compute a future value.

To illustrate how you might use these formulas, we will go back to an example in the chapter. If you invest \$25,000 at 12 percent per year, how long until you have \$50,000? You might set up a spreadsheet like this:

To Find	Enter This Formula
Future value	= FV (rate,nper,pmt,pv)
Present value	= PV (rate,nper,pmt,fv)
Discount rate	= RATE (nper,pmt,pv,fv)
Number of periods	= NPER (rate,pmt,pv,fv)

	A	B	C	D	E	F	G	H
1								
2	Using a spreadsheet for time value of money calculations							
3								
4	If we invest \$25,000 at 12 percent, how long until we have \$50,000? We need to solve							
5	for the unknown number of periods, so we use the formula NPER(rate, pmt, pv, fv).							
6								
7	Present value (pv):	\$25,000						
8	Future value (fv):	\$50,000						
9	Rate (rate):	.12						
10								
11	Periods:	6.1162554						
12								
13	The formula entered in cell B11 is =NPER(B9:0,-B7:B8); notice that pmt is zero and that pv							
14	has a negative sign on it. Also notice that rate is entered as a decimal, not a percentage.							

This is the stockholders’ share in the firm stated in accounting terms. The accounting value of stockholders’ equity increases when retained earnings are added. This occurs when the firm retains part of its earnings instead of paying them out as dividends.

The home page for the Financial Accounting Standards Board (FASB) is www.fasb.org

VALUE VERSUS COST

The accounting value of a firm’s assets is frequently referred to as the *carrying value* or the *book value* of the assets.² Under **generally accepted accounting principles (GAAP)**, audited financial statements of firms in the United States carry the assets at cost.³ Thus the terms *carrying value* and *book value* are unfortunate. They specifically say “value,” when in fact the accounting numbers are based on cost. This misleads many readers of financial statements to think that the firm’s assets are recorded at true market values. *Market value* is the price at which willing buyers and sellers would trade the assets. It would be only a coincidence if accounting value and market value were the same. In fact, management’s job is to create value for the firm that exceeds its cost.

Many people use the balance sheet, but the information each may wish to extract is not the same. A banker may look at a balance sheet for evidence of accounting liquidity and working capital. A supplier may also note the size of accounts payable and therefore the general promptness of payments. Many users of financial statements, including managers and investors, want to know the value of the firm, not its cost. This information is not found on the balance sheet. In fact, many of the true resources of the firm do not appear on the balance sheet: good management, proprietary assets, favorable economic conditions, and so on. Henceforth,

Explanatory Website Links

These Web links are specifically selected to accompany text material and provide students and instructors with a quick reference to additional information on the Internet.

25.5 Interest Rate Futures Contracts

In this section we consider interest rate futures contracts. Our examples deal with futures contracts on Treasury bonds because of their high popularity. We first price Treasury bonds and Treasury bond forward contracts. Differences between futures and forward contracts are explored. Hedging examples are provided next.

PRICING OF TREASURY BONDS

As mentioned earlier in the text, a Treasury bond pays semiannual interest over its life. In addition, the face value of the bond is paid at maturity. Consider a 20-year, 8 percent coupon bond that was issued on March 1. The first payment is to occur in six months—that is, on September 1. The value of the bond can be determined as follows:

Pricing of Treasury Bond

$$P_{TB} = \frac{\$40}{1 + R_1} + \frac{\$40}{(1 + R_2)^2} + \frac{\$40}{(1 + R_3)^3} + \dots + \frac{\$40}{(1 + R_{39})^{39}} + \frac{\$1,040}{(1 + R_{40})^{40}} \quad (25.1)$$

Because an 8 percent coupon bond pays interest of \$80 a year, the semiannual coupon is \$40. Principal and the semiannual coupon are both paid at maturity. As we mentioned in a previous chapter, the price of the Treasury bond, P_{TB} , is determined by discounting each payment on the bond at the appropriate spot rate. Because the payments are semiannual, each spot rate is expressed in semiannual terms. That is, imagine a horizontal term structure where the effective annual yield is 8 percent for all maturities. Because each spot

³Ordinarily, an unusual firm name in this textbook is a tip-off that it is fictional. This, however, is a true story.

Numbered Equations

Key equations are numbered and listed on the back endsheets for easy reference.

The end-of-chapter material reflects and builds upon the concepts learned from the chapter and study features.

Summary and Conclusions

1. Firms hedge to reduce risk. This chapter showed a number of hedging strategies.
2. A forward contract is an agreement by two parties to sell an item for cash at a later date. The price is set at the time the agreement is signed. However, cash changes hands on the date of delivery. Forward contracts are generally not traded on organized exchanges.
3. Futures contracts are also agreements for future delivery. They have certain advantages, such as liquidity, that forward contracts do not. An unusual feature of futures contracts is the mark-to-the-market convention. If the price of a futures contract falls on a particular day, every buyer of the contract must pay money to the clearinghouse. Every seller of the contract receives money from the clearinghouse. Everything is reversed if the price rises. The mark-to-the-market convention prevents defaults on futures contracts.
4. We divided hedges into two types: Short hedges and long hedges. An individual or firm that sells a futures contract to reduce risk is instituting a short hedge. Short hedges are generally appropriate for holders of inventory. An individual or firm that buys a futures contract to reduce risk is instituting a long hedge. Long hedges are typically used by firms with contracts to sell finished goods at a fixed price.
5. An interest rate futures contract employs a bond as the deliverable instrument. Because of their popularity, we worked with Treasury bond futures contracts. We showed that Treasury bond futures contracts can be priced using the same type of net present value analysis that is used to price Treasury bonds themselves.
6. Many firms face interest rate risk. They can reduce this risk by hedging with interest rate futures contracts. As with other commodities, a short hedge involves the sale of a futures contract. Firms that are committed to buying mortgages or other bonds are likely to institute short hedges. A long hedge involves the purchase of a futures contract. Firms that have agreed to sell mortgages or other bonds at a fixed price are likely to institute long hedges.
7. Duration measures the average maturity of all the cash flows in a bond. Bonds with high duration have high price variability. Firms frequently try to match the duration of their assets with the duration of their liabilities.
8. Swaps are agreements to exchange cash flows over time. The first major type is an interest rate swap in which one pattern of coupon payments, say, fixed payments, is exchanged for another, say, coupons that float with LIBOR. The second major type is a currency swap, in which an agreement is struck to swap payments denominated in one currency for payments in another currency over time.

Concept Questions

1. **Hedging Strategies** If a firm is selling futures contracts on lumber as a hedging strategy, what must be true about the firm's exposure to lumber prices?
2. **Hedging Strategies** If a firm is buying call options on pork belly futures as a hedging strategy, what must be true about the firm's exposure to pork belly prices?
3. **Forwards and Futures** What is the difference between a forward contract and a futures contract? Why do you think that futures contracts are much more common? Are there any circumstances under which you might prefer to use forwards instead of futures? Explain.

Excel Master It! Problems

Included in the end-of-chapter material are problems directly incorporating Excel, and new tips and techniques taught in the chapter's ExcelMaster supplement.

Excel Problems

Indicated by the Excel icon in the margin, these problems can be found at the end of almost all chapters. Located in Connect Finance for Corporate Finance 11e, Excel templates have been created for each of these problems, where students can use the data in the problem to work out the solution using Excel skills.

End-of-Chapter Cases

Located at the end of almost every chapter, these mini cases focus on common company situations that embody important corporate finance topics. Each case presents a new scenario, data, and a dilemma.

Several questions at the end of each case require students to analyze and focus on all of the material they learned in that chapter.

Summary and Conclusions

The summary provides a quick review of key concepts in the chapter.

Questions and Problems

Because solving problems is so critical to a student's learning, new questions and problems have been added, and existing questions and problems have been revised. All problems have also been thoroughly reviewed and checked for accuracy.

Problems have been grouped according to level of difficulty with the levels listed in the margin: Basic, Intermediate, and Challenge.

Additionally, we have tried to make the problems in the critical "concept" chapters, such as those on value, risk, and capital structure, especially challenging and interesting.

We provide answers to selected problems in Appendix B at the end of the book.

Excel Master It! Problem

Excel is a great tool for solving problems, but with many time value of money problems, you may still need to draw a time line. For example, consider a classic retirement problem. A friend is celebrating her birthday and wants to start saving for her anticipated retirement. She has the following years to retirement and retirement spending goals:

Years until retirement	30
Amount to withdraw each year	\$90,000
Years to withdraw in retirement	20

month in a bond account. The return of the stock account is expected to be 11 percent per year, and the bond account will earn 6 percent per year. When you retire, you will combine your money into an account with an annual return of 8 percent. How much can you withdraw each month from your account assuming a 25-year withdrawal period?

24. **Calculating Rates of Return** Suppose an investment offers to quadruple your money in 12 months (don't believe it). What rate of return per quarter are you being offered?
25. **Calculating Rates of Return** You're trying to choose between two different investments, both of which have up-front costs of \$75,000. Investment G returns \$125,000 in six years. Investment H returns \$185,000 in 10 years. Which of these investments has the higher return?
26. **Growing Perpetuities** Mark Weinstein has been working on an advanced technology in laser eye surgery. His technology will be available in the near term. He anticipates his first annual cash flow from the technology to be \$215,000, received two years from today. Subsequent annual cash flows will grow at 3.8 percent in perpetuity. What is the present value of the technology if the discount rate is 10 percent?
27. **Perpetuities** A prestigious investment bank designed a new security that pays a quarterly dividend of \$2.75 in perpetuity. The first dividend occurs one quarter

Mini Case

THE MBA DECISION

Ben Bates graduated from college six years ago with a finance undergraduate degree. Although he is satisfied with his current job, his goal is to become an investment banker. He feels that an MBA degree would allow him to achieve this goal. After examining schools, he has narrowed his choice to either Wilton University or Mount Perry College. Although internships are encouraged by both schools, to get class credit for the internship, no salary can be paid. Other than internships, neither school will allow its students to work while enrolled in its MBA program. Ben currently works at the money management firm of Dewey and Louis. His annual salary at the firm is \$65,000 per year, and his salary is expected to increase at 3 percent per year until retirement. He is currently 28 years old and expects to work for 40 more years. His current job includes a fully paid health insurance plan, and his current average tax rate is 26 percent. Ben has a savings account with enough money to cover the entire cost of his MBA program.

The Ritter College of Business at Wilton University is one of the top MBA programs in the country. The MBA degree requires two years of full-time enrollment at the university. The annual tuition is \$70,000, payable at the beginning of each school year. Books and other supplies are estimated to cost \$3,000 per year. Ben expects that after graduation from Wilton, he will receive a job offer for about \$110,000 per year, with a \$20,000 signing bonus. The salary at this job will increase at 4 percent per year. Because of the higher salary, his average income tax rate will increase to 31 percent.

Comprehensive Teaching and Learning Package

Corporate Finance has many options in terms of the textbook, instructor supplements, student supplements, and multimedia products. Mix and match to create a package that is perfect for your course.



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Diagnostic and Adaptive Learning of Concepts: LearnSmart Students want to make the best use of their study time. The LearnSmart adaptive self-study technology within Connect Finance provides students with a seamless combination of practice, assessment, and remediation for every concept in the textbook. LearnSmart’s intelligent software adapts to every student response and automatically delivers concepts that will advance the student’s understanding while reducing the time devoted to the concepts already mastered. The result for every student is the fastest path to mastery of the chapter. LearnSmart:

- Applies an intelligent concept engine to identify the relationships between ideas and to serve new concepts to each student only when he or she is ready.
- Adapts automatically to each student, so students spend less time on the topics they understand and practice more on those they have yet to master.
- Provides continual reinforcement and remediation, but gives only as much guidance as students need.
- Integrates diagnostics as part of the learning experience.
- Enables you to assess which concepts students have efficiently learned on their own, thus freeing class time for more applications and discussion.



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For more information about Connect Finance, go to connect.mheducation.com, or contact your local McGraw-Hill sales representative.



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Tegrity Campus is a service that makes class time available 24/7 by automatically capturing every lecture in a searchable format for students to review when they study and complete assignments. With a simple one-click start-and-stop process, you capture all computer screens and corresponding audio. Students can replay any part of any class with easy-to-use browser-based viewing on a PC or Mac.

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Assurance of Learning Ready

Assurance of Learning is an important element of many accreditation standards. *Corporate Finance*, 11e, is designed specifically to support your assurance of learning initiatives. Every test bank question is labeled with level of difficulty, topic area, Bloom's Taxonomy level, and AACSB skill area. Connect Finance, McGraw-Hill's online homework solution, and *EZ Test*, McGraw-Hill's easy-to-use test bank software, can search the test bank by these and other categories, providing an engine for targeted Assurance of Learning analysis and assessment.

AACSB Statement

The McGraw-Hill Companies is a proud corporate member of AACSB International. Understanding the importance and value of AACSB Accreditation, *Corporate Finance*, 11e, has sought to recognize the curricula guidelines detailed in the AACSB standards for business accreditation by connecting selected questions in the test bank to the general knowledge and skill guidelines found in the AACSB standards.

The statements contained in *Corporate Finance*, 11e, are provided only as a guide for the users of this text. The AACSB leaves content coverage and assessment within the purview of individual schools, the mission of the school, and the faculty. While *Corporate Finance*, 11e, and the teaching package make no claim of any specific AACSB qualification or evaluation, we have, within the test bank, labeled selected questions according to the six general knowledge and skills areas.

Instructor Resources

The Instructor Library in Connect Finance contains all the necessary supplements—Instructor’s Manual, Test Bank, Computerized Test Bank, and PowerPoint—all in one place. Go to connect.mheducation.com to find:

- **Instructor’s Manual**

Prepared by Steven D. Dolvin, Butler University

This is a great place to find new lecture ideas. The IM has three main sections. The first section contains a chapter outline and other lecture materials. The annotated outline for each chapter includes lecture tips, real-world tips, ethics notes, suggested PowerPoint slides, and, when appropriate, a video synopsis.

- **Test Bank**

Prepared by Kay Johnson

Here’s a great format for a better testing process. The Test Bank has well over 100 questions per chapter that closely link with the text material and provide a variety of question formats (multiple-choice questions/problems and essay questions) and levels of difficulty (basic, intermediate, and challenge) to meet every instructor’s testing needs. Problems are detailed enough to make them intuitive for students, and solutions are provided for the instructor.

- **Computerized Test Bank (Windows)**

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- **PowerPoint Presentation System**

Prepared by Steven D. Dolvin, Butler University

Customize our content for your course. This presentation has been thoroughly revised to include more lecture-oriented slides, as well as exhibits and examples both from the book and from outside sources. Applicable slides have Web links that take you directly to specific Internet sites, or a spreadsheet link to show an example in Excel. You can also go to the Notes Page function for more tips on presenting the slides. If you already have PowerPoint installed on your PC, you can edit, print, or rearrange the complete presentation to meet your specific needs.

STUDENT SUPPORT

- **Narrated PowerPoint Examples**

Each chapter’s slides follow the chapter topics and provide steps and explanations showing how to solve key problems. Because each student learns differently, a quick click on each slide will “talk through” its contents with you!

- **Excel Templates**

Corresponding to most end-of-chapter problems, each template allows the student to work through the problem using Excel. Each end-of-chapter problem with a template is indicated by an Excel icon in the margin beside it.

- **ExcelMaster**

Developed by the authors for the RWJ franchise, this valuable and comprehensive supplement provides a tutorial for students in using Excel in finance, broken out by chapter sections.

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By LeRoy Brooks, John Carroll University.

Just \$15.00 when packaged with this text. In this comprehensive simulation game, students control a hypothetical company over numerous periods of operation. As students make major financial and operating decisions for their company, they will develop and enhance skills in financial management and financial accounting statement analysis.

Acknowledgments

Over the years, many others have contributed their time and expertise to the development and writing of this text. We extend our thanks once again for their assistance and countless insights:

Lucy Ackert

Kennesaw State University

Amanda Adkisson

Texas A&M University

Raj Aggarwal

Federal Reserve Bank of Cleveland

Anne Anderson

Lehigh University

Christopher Anderson

University of Kansas

James J. Angel

Georgetown University

Nasser Arshadi

University of Missouri–St. Louis

Kevin Bahr

University of Wisconsin–Stevens Point

Robert Balik

Western Michigan University

John W. Ballantine

Brandeis University

Thomas Bankston

Angelo State University

Brad Barber

University of California–Davis

Michael Barry

Boston College

Swati Bhatt

Rutgers University

Roger Bolton

Williams College

Gordon Bonner

University of Delaware

Oswald Bowlin

Texas Technical University

Ronald Braswell

Florida State University

William O. Brown

Claremont McKenna College

Kirt Butler

Michigan State University

Bill Callahan

Southern Methodist University

Steven Carvell

Cornell University

Indudeep S. Chhachhi

Western Kentucky University

Kevin Chiang

University of Vermont

Andreas Christofi

Monmouth University

Jonathan Clarke

Georgia Institute of Technology

Jeffrey L. Coles

University of Utah

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Wayne State University

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Wake Forest University

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University of Delaware

Arnold Cowan

Iowa State University

Raymond Cox

Thompson Rivers University

John Crockett

George Mason University

Mark Cross

Miami University

Ron Crowe

Jacksonville University

William Damon

Vanderbilt University

Sudip Datta

Wayne State University

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Wichita State University

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University of California–Berkeley

Dennis Draper

Loyola Marymount University

Jean-Francois Dreyfus

New York University

Gene Drzycimski

University of Wisconsin–Oshkosh

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The University of Texas

at Austin

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University of New Haven

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Southern Connecticut State University

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University of Oklahoma

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Drexel University

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University of Delaware

Paige Fields

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*University of Central
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Yee-Tien Fu
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Partha Gangopadhyay
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Bruno Gerard
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Arkansas State University

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Timothy Thompson

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Dartmouth College

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University of Redlands

Gary Tripp

Southern New Hampshire University

Charles Trzcinka

Indiana University

Haluk Unal

University of Maryland–College Park

Oscar Varela

University of Texas–El Paso

Steven Venti

Dartmouth College

Avinash Verma

University of California–Berkeley

Joseph Vu

DePaul University

Lankford Walker

Eastern Illinois University

Ralph Walkling

Ohio State University

F. Katherine Warne

Southern Bell College

Sue White

University of Maryland–College Park

Robert Whitelaw

New York University

Berry Wilson

Pace University

Robert Wood

Salisbury University

Donald Wort

California State University–East Bay

John Zietlow

Malone College

Thomas Zorn

University of Nebraska–Lincoln

Kent Zumwalt

Colorado State University

For their help on the eleventh edition, we would like to thank Joe Smolira, Belmont University and Kay Johnson for their work developing the supplements. We also owe a debt of gratitude to Edward I. Altman of New York University; Robert S. Hansen of Tulane; Duke Bristow, Harry DeAngelo, and Suh-Pyng Ku of the University of Southern California; and Jay R. Ritter of the University of Florida, who have provided several thoughtful comments and immeasurable help.

We thank Steve Hailey and Andrew Beeli, University of Kentucky students, for their extensive proofing and problem-checking efforts.

Over the past three years readers have provided assistance by detecting and reporting errors. Our goal is to offer the best textbook available on the subject, so this information was invaluable as we prepared the eleventh edition. We want to ensure that all future editions are error-free—and therefore we offer \$10 per arithmetic error to the first individual reporting it. Any arithmetic error resulting in subsequent errors will be counted double. All errors should be reported to Dr. Brad Jordan, c/o Editorial - Finance, McGraw-Hill Education, 1333 Burr Ridge Parkway, Burr Ridge, IL 60527.

Many talented professionals at McGraw-Hill Education have contributed to the development of *Corporate Finance*, Eleventh Edition. We would especially like to thank Chuck Synovec, Jennifer Upton, Melissa Caughlin, Kathryn Wright, Matt Diamond, Michele Janicek, and Bruce Gin.

Finally, we wish to thank our families and friends, Carol, Kate, Jon, Mark, and Lynne, for their forbearance and help.

Stephen A. Ross

Randolph W. Westerfield

Jeffrey F. Jaffe

Bradford D. Jordan

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1

PART I: OVERVIEW

Introduction to Corporate Finance

George Zimmer, founder of The Men's Wearhouse, for years appeared in television ads promising, "You're going to like the way you look. I guarantee it." But, in mid-2013, Zimmer evidently didn't look so good to the company's board of directors, which abruptly fired him. It was reported that Zimmer had a series of disagreements with the board, including a desire to take the company private. Evidently, Zimmer's ideas did not "suit" the board.

Understanding Zimmer's journey from the founder of a clothing store that used a cigar box as a cash register, to corporate executive, and finally to ex-employee takes us into issues involving the corporate form of organization, corporate goals, and corporate control—all of which we discuss in this chapter. You're going to learn a lot if you read it. We guarantee it.

1.1 What Is Corporate Finance?

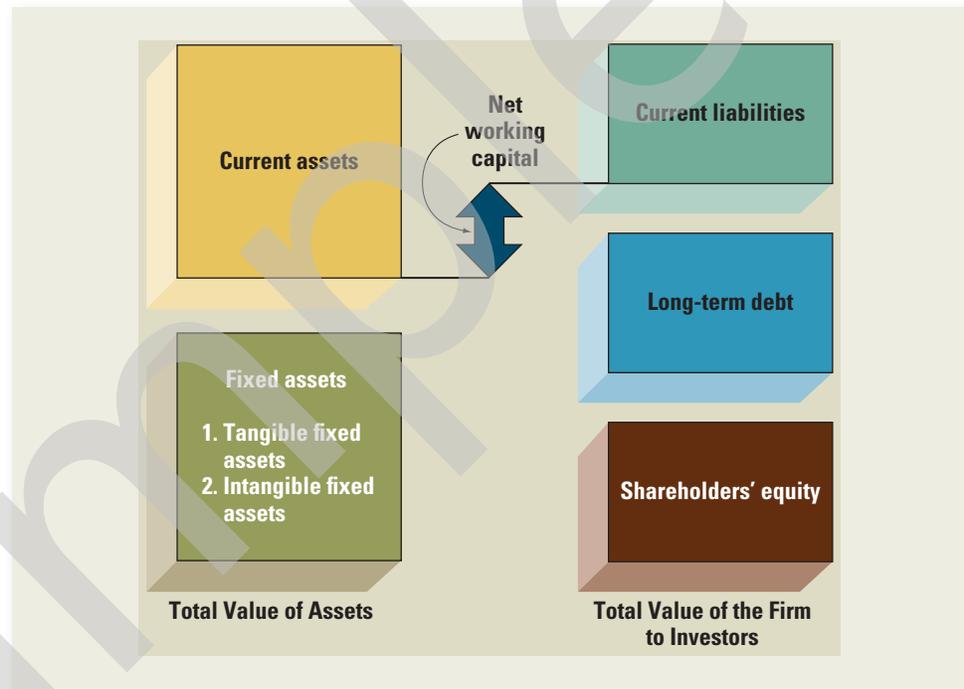
Suppose you decide to start a firm to make tennis balls. To do this you hire managers to buy raw materials, and you assemble a workforce that will produce and sell finished tennis balls. In the language of finance, you make an investment in assets such as inventory, machinery, land, and labor. The amount of cash you invest in assets must be matched by an equal amount of cash raised by financing. When you begin to sell tennis balls, your firm will generate cash. This is the basis of value creation. The purpose of the firm is to create value for you, the owner. The value is reflected in the framework of the simple balance sheet model of the firm.

THE BALANCE SHEET MODEL OF THE FIRM

Suppose we take a financial snapshot of the firm and its activities at a single point in time. Figure 1.1 shows a graphic conceptualization of the balance sheet, and it will help introduce you to corporate finance.

The assets of the firm are on the left side of the balance sheet. These assets can be thought of as current and fixed. *Fixed assets* are those that will last a long time, such as buildings. Some fixed assets are tangible, such as machinery and equipment. Other fixed assets are intangible, such as patents and trademarks. The other category of assets, *current*

Figure 1.1
The Balance Sheet
Model of the Firm



assets, comprises those that have short lives, such as inventory. The tennis balls that your firm has made, but has not yet sold, are part of its inventory. Unless you have overproduced, they will leave the firm shortly.

Before a company can invest in an asset, it must obtain financing, which means that it must raise the money to pay for the investment. The forms of financing are represented on the right side of the balance sheet. A firm will issue (sell) pieces of paper called *debt* (loan agreements) or *equity shares* (stock certificates). Just as assets are classified as long-lived or short-lived, so too are liabilities. A short-term debt is called a *current liability*. Short-term debt represents loans and other obligations that must be repaid within one year. Long-term debt is debt that does not have to be repaid within one year. Shareholders' equity represents the difference between the value of the assets and the debt of the firm. In this sense, it is a residual claim on the firm's assets.

From the balance sheet model of the firm, it is easy to see why finance can be thought of as the study of the following three questions:

1. In what long-lived assets should the firm invest? This question concerns the left side of the balance sheet. Of course the types and proportions of assets the firm needs tend to be set by the nature of the business. We use the term **capital budgeting** to describe the process of making and managing expenditures on long-lived assets.
2. How can the firm raise cash for required capital expenditures? This question concerns the right side of the balance sheet. The answer to this question involves the firm's **capital structure**, which represents the proportions of the firm's financing from current and long-term debt and equity.
3. How should short-term operating cash flows be managed? This question concerns the upper portion of the balance sheet. There is often a mismatch between the timing of cash inflows and cash outflows during operating activities. Furthermore, the amount

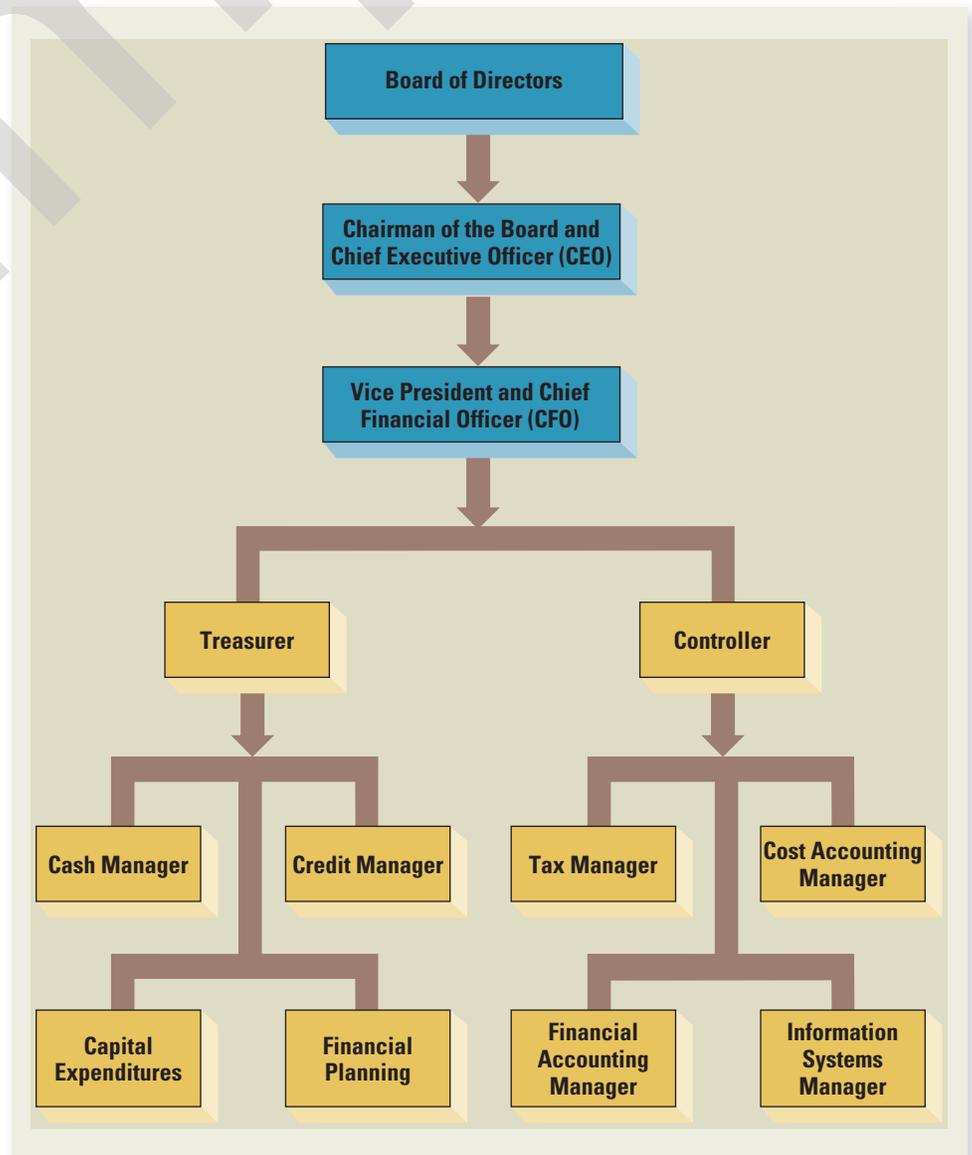
and timing of operating cash flows are not known with certainty. Financial managers must attempt to manage the gaps in cash flow. From a balance sheet perspective, short-term management of cash flow is associated with a firm's **net working capital**. Net working capital is defined as current assets minus current liabilities. From a financial perspective, short-term cash flow problems come from the mismatching of cash inflows and outflows. This is the subject of short-term finance.

THE FINANCIAL MANAGER

For current issues facing CFOs, see www.cfo.com.

In large firms, the finance activity is usually associated with a top officer of the firm, such as the vice president and chief financial officer, and some lesser officers. Figure 1.2 depicts a general organizational structure emphasizing the finance

Figure 1.2
Hypothetical
Organization Chart



activity within the firm. Reporting to the chief financial officer are the treasurer and the controller. The treasurer is responsible for handling cash flows, managing capital expenditure decisions, and making financial plans. The controller handles the accounting function, which includes taxes, cost and financial accounting, and information systems.

1.2 The Corporate Firm

The firm is a way of organizing the economic activity of many individuals. A basic problem of the firm is how to raise cash. The corporate form of business—that is, organizing the firm as a corporation—is the standard method for solving problems encountered in raising large amounts of cash. However, businesses can take other forms. In this section we consider the three basic legal forms of organizing firms, and we see how firms go about the task of raising large amounts of money under each form.

THE SOLE PROPRIETORSHIP

A **sole proprietorship** is a business owned by one person. Suppose you decide to start a business to produce mousetraps. Going into business is simple: You announce to all who will listen, “Today, I am going to build a better mousetrap.”

Most large cities require that you obtain a business license. Afterward, you can begin to hire as many people as you need and borrow whatever money you need. At year-end all the profits and the losses will be yours.

Here are some factors that are important in considering a sole proprietorship:

1. The sole proprietorship is the cheapest business to form. No formal charter is required, and few government regulations must be satisfied for most industries.
2. A sole proprietorship pays no corporate income taxes. All profits of the business are taxed as individual income.
3. The sole proprietorship has unlimited liability for business debts and obligations. No distinction is made between personal and business assets.
4. The life of the sole proprietorship is limited by the life of the sole proprietor.
5. Because the only money invested in the firm is the proprietor’s, the equity money that can be raised by the sole proprietor is limited to the proprietor’s personal wealth.

THE PARTNERSHIP

Any two or more people can get together and form a **partnership**. Partnerships fall into two categories: (1) general partnerships and (2) limited partnerships.

In a *general partnership* all partners agree to provide some fraction of the work and cash and to share the profits and losses. Each partner is liable for all of the debts of the partnership. A partnership agreement specifies the nature of the arrangement. The partnership agreement may be an oral agreement or a formal document setting forth the understanding.

Limited partnerships permit the liability of some of the partners to be limited to the amount of cash each has contributed to the partnership. Limited partnerships usually require that (1) at least one partner be a general partner and (2) the limited partners do

not participate in managing the business. Here are some things that are important when considering a partnership:

1. Partnerships are usually inexpensive and easy to form. Written documents are required in complicated arrangements. Business licenses and filing fees may be necessary.
2. General partners have unlimited liability for all debts. The liability of limited partners is usually limited to the contribution each has made to the partnership. If one general partner is unable to meet his or her commitment, the shortfall must be made up by the other general partners.
3. The general partnership is terminated when a general partner dies or withdraws (but this is not so for a limited partner). It is difficult for a partnership to transfer ownership without dissolving. Usually all general partners must agree. However, limited partners may sell their interest in a business.
4. It is difficult for a partnership to raise large amounts of cash. Equity contributions are usually limited to a partner's ability and desire to contribute to the partnership. Many companies, such as Apple Inc., start life as a proprietorship or partnership, but at some point they choose to convert to corporate form.
5. Income from a partnership is taxed as personal income to the partners.
6. Management control resides with the general partners. Usually a majority vote is required on important matters, such as the amount of profit to be retained in the business.

It is difficult for large business organizations to exist as sole proprietorships or partnerships. The main advantage to a sole proprietorship or partnership is the cost of getting started. Afterward, the disadvantages, which may become severe, are (1) unlimited liability, (2) limited life of the enterprise, and (3) difficulty of transferring ownership. These three disadvantages lead to (4) difficulty in raising cash.

THE CORPORATION

Of the forms of business enterprises, the **corporation** is by far the most important. It is a distinct legal entity. As such, a corporation can have a name and enjoy many of the legal powers of natural persons. For example, corporations can acquire and exchange property. Corporations can enter contracts and may sue and be sued. For jurisdictional purposes the corporation is a citizen of its state of incorporation (it cannot vote, however).

Starting a corporation is more complicated than starting a proprietorship or partnership. The incorporators must prepare articles of incorporation and a set of bylaws. The articles of incorporation must include the following:

1. Name of the corporation.
2. Intended life of the corporation (it may be forever).
3. Business purpose.
4. Number of shares of stock that the corporation is authorized to issue, with a statement of limitations and rights of different classes of shares.
5. Nature of the rights granted to shareholders.
6. Number of members of the initial board of directors.



The bylaws are the rules to be used by the corporation to regulate its own existence, and they concern its shareholders, directors, and officers. Bylaws range from the briefest possible statement of rules for the corporation's management to hundreds of pages of text.

In its simplest form, the corporation comprises three sets of distinct interests: the shareholders (the owners), the directors, and the corporation officers (the top management). Traditionally, the shareholders control the corporation's direction, policies, and activities. The shareholders elect a board of directors, who in turn select top management. Members of top management serve as corporate officers and manage the operations of the corporation in the best interest of the shareholders. In closely held corporations with few shareholders, there may be a large overlap among the shareholders, the directors, and the top management. However, in larger corporations, the shareholders, directors, and the top management are likely to be distinct groups.

The potential separation of ownership from management gives the corporation several advantages over proprietorships and partnerships:

1. Because ownership in a corporation is represented by shares of stock, ownership can be readily transferred to new owners. Because the corporation exists independently of those who own its shares, there is no limit to the transferability of shares as there is in partnerships.
2. The corporation has unlimited life. Because the corporation is separate from its owners, the death or withdrawal of an owner does not affect the corporation's legal existence. The corporation can continue on after the original owners have withdrawn.
3. The shareholders' liability is limited to the amount invested in the ownership shares. For example, if a shareholder purchased \$1,000 in shares of a corporation, the potential loss would be \$1,000. In a partnership, a general partner with a \$1,000 contribution could lose the \$1,000 plus any other indebtedness of the partnership.

Limited liability, ease of ownership transfer, and perpetual succession are the major advantages of the corporate form of business organization. These give the corporation an enhanced ability to raise cash.

There is, however, one great disadvantage to incorporation. The federal government taxes corporate income (the states do as well). This tax is in addition to the personal income tax that shareholders pay on dividend income they receive. This is double taxation for shareholders when compared to taxation on proprietorships and partnerships. Table 1.1 summarizes our discussion of partnerships and corporations.

Today all 50 states have enacted laws allowing for the creation of a relatively new form of business organization, the limited liability company (LLC). The goal of this entity is to operate and be taxed like a partnership but retain limited liability for owners, so an LLC is essentially a hybrid of partnership and corporation. Although states have differing definitions for LLCs, the more important scorekeeper is the Internal Revenue Service (IRS). The IRS will consider an LLC a corporation, thereby subjecting it to double taxation, unless it meets certain specific criteria. In essence, an LLC cannot be too corporation-like, or it will be treated as one by the IRS. LLCs have become common. For example, Goldman, Sachs and Co., one of Wall Street's last remaining partnerships, decided to convert from a private partnership to an LLC (it later "went public," becoming a publicly held corporation). Large accounting firms and law firms by the score have converted to LLCs.

Table 1.1 A Comparison of Partnerships and Corporations

	Corporation	Partnership
Liquidity and marketability	Shares can be exchanged without termination of the corporation. Common stock can be listed on a stock exchange.	Units are subject to substantial restrictions on transferability. There is usually no established trading market for partnership units.
Voting rights	Usually each share of common stock entitles the holder to one vote per share on matters requiring a vote and on the election of the directors. Directors determine top management.	Some voting rights by limited partners. However, general partners have exclusive control and management of operations.
Taxation	Corporations have double taxation: Corporate income is taxable, and dividends to shareholders are also taxable.	Partnerships are not taxable. Partners pay personal taxes on partnership profits.
Reinvestment and dividend payout	Corporations have broad latitude on dividend payout decisions.	Partnerships are generally prohibited from reinvesting partnership profits. All profits are distributed to partners.
Liability	Shareholders are not personally liable for obligations of the corporation.	Limited partners are not liable for obligations of partnerships. General partners may have unlimited liability.
Continuity of existence	Corporations may have a perpetual life.	Partnerships have limited life.

A CORPORATION BY ANOTHER NAME . . .

The corporate form of organization has many variations around the world. The exact laws and regulations differ from country to country, of course, but the essential features of public ownership and limited liability remain. These firms are often called *joint stock companies*, *public limited companies*, or *limited liability companies*, depending on the specific nature of the firm and the country of origin.

Table 1.2 gives the names of a few well-known international corporations, their countries of origin, and a translation of the abbreviation that follows each company name.

Table 1.2 International Corporations

Company	Country of Origin	Type of Company	
		In Original Language	Interpretation
Bayerische Motoren Werke (BMW) AG	Germany	Aktiengesellschaft	Corporation
Red Bull GmbH	Austria	Gesellschaft mit Beschränkter Haftung	Limited liability company
Rolls-Royce PLC	United Kingdom	Public limited company	Public Ltd. Company
Shell UK Ltd.	United Kingdom	Limited	Corporation
Unilever NV	Netherlands	Naamloze Vennootschap	Joint stock company
Fiat SpA	Italy	Società per Azioni	Joint stock company
Volvo AB	Sweden	Aktiebolag	Joint stock company
Peugeot SA	France	Société Anonyme	Joint stock company

Table 1.3 Some Key Skills Needed for the Chief Financial Officers of Large Public Companies

Strategizing	Must be knowledgeable of acquisitions, raising funds, risk management, and joint ventures
Financial reporting	Needs to communicate key financial results to the CEO, board of directors, and senior staff
Accounting	Must prepare important financial and accounting information for auditors, company budgets, and key regulators
Investor relations	Must participate in presentations to current and future shareholders and industry analysts
Information technology	Must lead efforts to incorporate new information technology into administrative information systems

1.3 The Importance of Cash Flows

The most important job of a financial manager is to create value from the firm's capital budgeting, financing, and net working capital activities. How do financial managers create value? The answer is that the firm should:

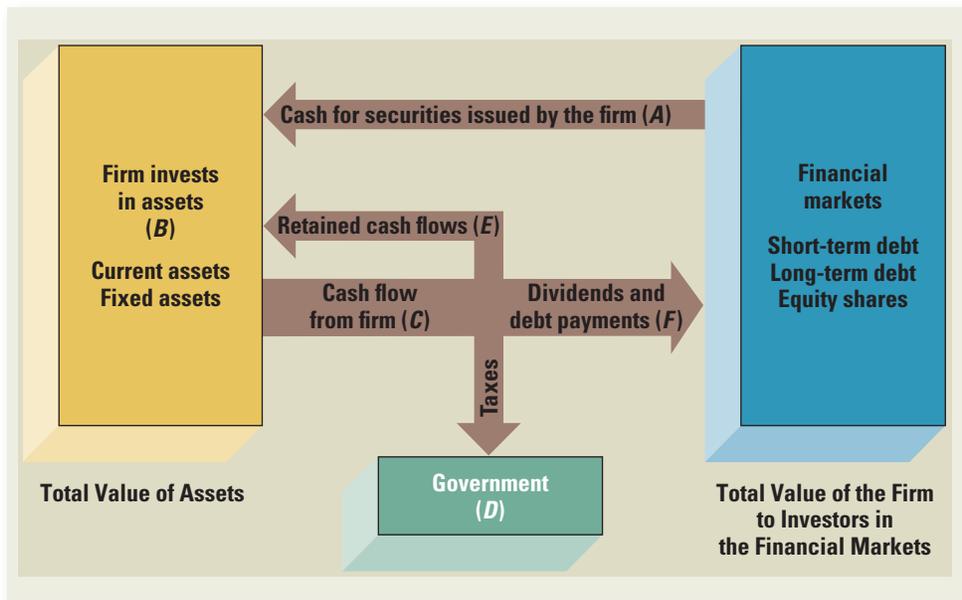
1. Try to buy assets that generate more cash than they cost.
2. Sell bonds, stocks, and other financial instruments that raise more cash than they cost.

Thus, the firm must create more cash flow than it uses. The cash flows paid to bondholders and stockholders of the firm should be greater than the cash flows put into the firm by the bondholders and stockholders.

The interplay of the firm's activities with the financial markets is illustrated in Figure 1.3. The arrows in Figure 1.3 trace cash flow from the firm to the financial

Figure 1.3

Cash Flows between the Firm and the Financial Markets



markets and back again. Suppose we begin with the firm's financing activities. To raise money, the firm sells debt and equity shares to investors in the financial markets. This results in cash flows from the financial markets to the firm (*A*). This cash is invested in the investment activities (assets) of the firm (*B*) by the firm's management. The cash generated by the firm (*C*) is paid to shareholders and bondholders (*F*). The shareholders receive cash in the form of dividends; the bondholders who lent funds to the firm receive interest and, when the initial loan is repaid, principal. Not all of the firm's cash is paid out. Some is retained (*E*), and some is paid to the government as taxes (*D*).

Over time, if the cash paid to shareholders and bondholders (*F*) is greater than the cash raised in the financial markets (*A*), value will be created.

Identification of Cash Flows Unfortunately, it is sometimes not easy to observe cash flows directly. Much of the information we obtain is in the form of accounting statements, and much of the work of financial analysis is to extract cash flow information from these statements. The following example illustrates how this is done.

EXAMPLE 1.1

Accounting Profit versus Cash Flows The Midland Company refines and trades gold. At the end of the year, it sold 2,500 ounces of gold for \$1 million. The company had acquired the gold for \$900,000 at the beginning of the year. The company paid cash for the gold when it was purchased. Unfortunately it has yet to collect from the customer to whom the gold was sold. The following is a standard accounting of Midland's financial circumstances at year-end:

The Midland Company Accounting View Income Statement Year Ended December 31	
Sales	\$1,000,000
– Costs	– 900,000
Profit	\$ 100,000

By generally accepted accounting principles (GAAP), the sale is recorded even though the customer has yet to pay. It is assumed that the customer will pay soon. From the accounting perspective, Midland seems to be profitable. However, the perspective of corporate finance is different. It focuses on cash flows:

The Midland Company Financial View Income Statement Year Ended December 31	
Cash inflow	\$ 0
Cash outflow	– 900,000
	–\$ 900,000

The perspective of corporate finance is interested in whether cash flows are being created by the gold trading operations of Midland. Value creation depends on cash flows. For Midland, value creation depends on whether and when it actually receives \$1 million.



Timing of Cash Flows The value of an investment made by a firm depends on the timing of cash flows. One of the most important principles of finance is that individuals prefer to receive cash flows earlier rather than later. One dollar received today is worth more than one dollar received next year.

EXAMPLE 1.2

Cash Flow Timing The Midland Company is attempting to choose between two proposals for new products. Both proposals will provide additional cash flows over a four-year period and will initially cost \$10,000. The cash flows from the proposals are as follows:

Year	New Product A	New Product B
1	\$ 0	\$ 4,000
2	0	4,000
3	0	4,000
4	20,000	4,000
Total	\$20,000	\$16,000

At first it appears that new product A would be best. However, the cash flows from proposal B come earlier than those of A. Without more information, we cannot decide which set of cash flows would create the most value for the bondholders and shareholders. It depends on whether the value of getting cash from B up front outweighs the extra total cash from A.

Risk of Cash Flows The firm must consider risk. The amount and timing of cash flows are not usually known with certainty. Most investors have an aversion to risk.

EXAMPLE 1.3

Risk The Midland Company is considering expanding operations overseas. It is evaluating Europe and Japan as possible sites. Europe is considered to be relatively safe, whereas operating in Japan is seen as very risky. In both cases the company would close down operations after one year.

After doing a complete financial analysis, Midland has come up with the following cash flows of the alternative plans for expansion under three scenarios—pessimistic, most likely, and optimistic:

	Pessimistic	Most Likely	Optimistic
Europe	\$75,000	\$100,000	\$125,000
Japan	0	150,000	200,000

If we ignore the pessimistic scenario, perhaps Japan is the best alternative. When we take the pessimistic scenario into account, the choice is unclear. Japan appears to be riskier, but it also offers a higher expected level of cash flow. What is risk and how can it be defined? We must try to answer this important question. Corporate finance cannot avoid coping with risky alternatives, and much of our book is devoted to developing methods for evaluating risky opportunities.

1.4 The Goal of Financial Management

Assuming that we restrict our discussion to for-profit businesses, the goal of financial management is to make money or add value for the owners. This goal is a little vague, of course, so we examine some different ways of formulating it to come up with a more precise definition. Such a definition is important because it leads to an objective basis for making and evaluating financial decisions.

POSSIBLE GOALS

If we were to consider possible financial goals, we might come up with some ideas like the following:

- Survive.
- Avoid financial distress and bankruptcy.
- Beat the competition.
- Maximize sales or market share.
- Minimize costs.
- Maximize profits.
- Maintain steady earnings growth.

These are only a few of the goals we could list. Furthermore, each of these possibilities presents problems as a goal for the financial manager.

For example, it's easy to increase market share or unit sales: All we have to do is lower our prices or relax our credit terms. Similarly, we can always cut costs simply by doing away with things such as research and development. We can avoid bankruptcy by never borrowing any money or never taking any risks, and so on. It's not clear that any of these actions are in the stockholders' best interests.

Profit maximization would probably be the most commonly cited goal, but even this is not a precise objective. Do we mean profits this year? If so, then we should note that actions such as deferring maintenance, letting inventories run down, and taking other short-run cost-cutting measures will tend to increase profits now, but these activities aren't necessarily desirable.

The goal of maximizing profits may refer to some sort of "long-run" or "average" profits, but it's still unclear exactly what this means. First, do we mean something like accounting net income or earnings per share? As we will see in more detail in the next chapter, these accounting numbers may have little to do with what is good or bad for the firm. We are actually more interested in cash flows. Second, what do we mean by the long run? As a famous economist once remarked, in the long run, we're all dead! More to the point, this goal doesn't tell us what the appropriate trade-off is between current and future profits.

The goals we've listed here are all different, but they tend to fall into two classes. The first of these relates to profitability. The goals involving sales, market share, and cost control all relate, at least potentially, to different ways of earning or increasing profits. The goals in the second group, involving bankruptcy avoidance, stability, and safety, relate in some way to controlling risk. Unfortunately, these two types of goals are somewhat contradictory. The pursuit of profit normally involves some element of risk, so it isn't really possible to maximize both safety and profit. What we need, therefore, is a goal that encompasses both factors.



THE GOAL OF FINANCIAL MANAGEMENT

The financial manager in a corporation makes decisions for the stockholders of the firm. So, instead of listing possible goals for the financial manager, we really need to answer a more fundamental question: From the stockholders' point of view, what is a good financial management decision?

If we assume that stockholders buy stock because they seek to gain financially, then the answer is obvious: Good decisions increase the value of the stock, and poor decisions decrease the value of the stock.

From our observations, it follows that the financial manager acts in the shareholders' best interests by making decisions that increase the value of the stock. The appropriate goal for the financial manager can thus be stated quite easily:

The goal of financial management is to maximize the current value per share of the existing stock.

The goal of maximizing the value of the stock avoids the problems associated with the different goals we listed earlier. There is no ambiguity in the criterion, and there is no short-run versus long-run issue. We explicitly mean that our goal is to maximize the *current* stock value.

If this goal seems a little strong or one-dimensional to you, keep in mind that the stockholders in a firm are residual owners. By this we mean that they are entitled only to what is left after employees, suppliers, and creditors (and everyone else with legitimate claims) are paid their due. If any of these groups go unpaid, the stockholders get nothing. So if the stockholders are winning in the sense that the leftover, residual portion is growing, it must be true that everyone else is winning also. In other words, managers should make decisions that they believe will achieve the highest firm value because, by doing so, shareholders will benefit the most.

Because the goal of financial management is to maximize the value of the stock, we need to learn how to identify investments and financing arrangements that favorably impact the value of the stock. This is precisely what we will be studying. In the previous section we emphasized the importance of cash flows in value creation. In fact, we could have defined *corporate finance* as the study of the relationship between business decisions, cash flows, and the value of the stock in the business.

A MORE GENERAL GOAL

If our goal is as stated in the preceding section (to maximize the value of the stock), an obvious question comes up: What is the appropriate goal when the firm has no traded stock? Corporations are certainly not the only type of business; and the stock in many corporations rarely changes hands, so it's difficult to say what the value per share is at any particular time.

As long as we are considering for-profit businesses, only a slight modification is needed. The total value of the stock in a corporation is simply equal to the value of the owners' equity. Therefore, a more general way of stating our goal is as follows: Maximize the value of the existing owners' equity.

With this in mind, we don't care whether the business is a proprietorship, a partnership, or a corporation. For each of these, good financial decisions increase the value of the owners' equity, and poor financial decisions decrease it. In fact, although we choose to focus on corporations in the chapters ahead, the principles we develop apply to all forms of business. Many of them even apply to the not-for-profit sector.

Business ethics are considered at www.business-ethics.com.

Finally, our goal does not imply that the financial manager should take illegal or unethical actions in the hope of increasing the value of the equity in the firm. What we mean is that the financial manager best serves the owners of the business by identifying goods and services that add value to the firm because they are desired, legal, and valued in the free marketplace.

1.5 The Agency Problem and Control of the Corporation

We've seen that the financial manager acts in the best interests of the stockholders by taking actions that increase the value of the stock. However, in large corporations ownership can be spread over a huge number of stockholders. This dispersion of ownership arguably means that management effectively controls the firm. In this case, will management necessarily act in the best interests of the stockholders? Put another way, might not management pursue its own goals at the stockholders' expense? In the following pages we briefly consider some of the arguments relating to this question.

Corporate governance varies quite a bit around the world. For example, in most countries other than the United States and the United Kingdom, publicly traded companies are usually controlled by one or more large shareholders.¹ Moreover, in countries with limited shareholder protection, when compared to countries with strong shareholder protection like the United States and the United Kingdom, large shareholders may have a greater opportunity to take advantage of minority shareholders. Research shows that a country's investor protection framework is important to understanding a firm's cash holdings and dividend payouts. For example, studies find that shareholders do not highly value cash holdings in firms in countries with low investor protection when compared to firms in the United States where investor protection is high.

In the basic corporate governance setup, the shareholders elect the board of directors who in turn appoint the top corporate managers, such as the CEO. The CEO is usually a member of the board of directors. One aspect of corporate governance that has received attention recently concerns the chair of a firm's board of directors. In a large number of U.S. corporations, the CEO and the board chair are the same person. An argument can be made that combining the CEO and board chair positions can contribute to poor corporate governance. When comparing corporate governance in the United States and the United Kingdom, an edge is often given to the United Kingdom, partly because more than 90 percent of U.K. companies are chaired by outside directors rather than the CEO. This is a contentious issue confronting many United States corporations. For example, in 2012, 20 percent of the S&P 500 companies had named an independent outsider as board chair, up from only 10 percent five years earlier.

AGENCY RELATIONSHIPS

The relationship between stockholders and management is called an *agency relationship*. Such a relationship exists whenever someone (the principal) hires another (the agent) to represent his or her interests. For example, you might hire someone (an agent) to sell a car that you own while you are away at school. In all such relationships there is a possibility of a conflict of interest between the principal and the agent. Such a conflict is called an **agency problem**.

¹For a somewhat contrary view about the concentration of shareholder ownership in the U.S. and around the world, see Clifford G. Holderness "The Myth of Diffuse Ownership in the United States." *The Review of Financial Studies*, volume 22, number 4, April 2009.



Suppose you hire someone to sell your car and you agree to pay that person a flat fee when he or she sells the car. The agent's incentive in this case is to make the sale, not necessarily to get you the best price. If you offer a commission of, say, 10 percent of the sales price instead of a flat fee, then this problem might not exist. This example illustrates that the way in which an agent is compensated is one factor that affects agency problems.

MANAGEMENT GOALS

To see how management and stockholder interests might differ, imagine that a firm is considering a new investment. The new investment is expected to favorably impact the share value, but it is also a relatively risky venture. The owners of the firm will wish to take the investment (because the stock value will rise), but management may not because there is the possibility that things will turn out badly and management jobs will be lost. If management does not take the investment, then the stockholders may lose a valuable opportunity. This is one example of an *agency cost*.

More generally, the term *agency costs* refers to the costs of the conflict of interest between stockholders and management. These costs can be indirect or direct. An indirect agency cost is a lost opportunity, such as the one we have just described.

Direct agency costs come in two forms. The first type is a corporate expenditure that benefits management but costs the stockholders. Perhaps the purchase of a luxurious and unneeded corporate jet would fall under this heading. The second type of direct agency cost is an expense that arises from the need to monitor management actions. Paying outside auditors to assess the accuracy of financial statement information could be one example.

It is sometimes argued that, left to themselves, managers would tend to maximize the amount of resources over which they have control or, more generally, corporate power or wealth. This goal could lead to an overemphasis on corporate size or growth. For example, cases in which management is accused of overpaying to buy up another company just to increase the size of the business or to demonstrate corporate power are not uncommon. Obviously, if overpayment does take place, such a purchase does not benefit the stockholders of the purchasing company.

Our discussion indicates that management may tend to overemphasize organizational survival to protect job security. Also, management may dislike outside interference, so independence and corporate self-sufficiency may be important goals.

DO MANAGERS ACT IN THE STOCKHOLDERS' INTERESTS?

Whether managers will, in fact, act in the best interests of stockholders depends on two factors. First, how closely are management goals aligned with stockholder goals? This question relates, at least in part, to the way managers are compensated. Second, can managers be replaced if they do not pursue stockholder goals? This issue relates to control of the firm. As we will discuss, there are a number of reasons to think that, even in the largest firms, management has a significant incentive to act in the interests of stockholders.

Managerial Compensation Management will frequently have a significant economic incentive to increase share value for two reasons. First, managerial compensation, particularly at the top, is usually tied to financial performance in general and often to share value in particular. For example, managers are frequently given the option to buy stock at a bargain price. The more the stock is worth, the more valuable is this option. In fact, options are often used to motivate employees of all types, not just

top management. For example, during 2013, Google expensed about \$2.752 billion in stock-related compensation, or about \$57,630 per employee. As we mentioned, many firms also give managers an ownership stake in the company by granting stock or stock options. In 2013, the total compensation for Leslie Moonves, CEO of CBS, was reported by *The Wall Street Journal* to be just over \$65 million. His base salary was \$3.5 million with annual incentives of \$32 million, stock option grants of \$5.8 million, restricted stock grants of \$19.2 million, and performance awards of \$4.7 million. Although there are many critics of the high level of CEO compensation, from the stockholders' point of view, sensitivity of compensation to firm performance is usually more important.

The second incentive managers have relates to job prospects. Better performers within the firm will tend to get promoted. More generally, managers who are successful in pursuing stockholder goals will be in greater demand in the labor market and thus command higher salaries.

In fact, managers who are successful in pursuing stockholder goals can reap enormous rewards. During 2013, the median compensation for CEOs at the largest 500 U.S. companies was \$10.5 million. The best-paid executive in 2013 was Larry Ellison, the CEO of Oracle; according to *The Wall Street Journal*, he made about \$76.9 million. By way of comparison, basketball superstar LeBron James made \$72.3 million, and actor Robert Downey Jr. made about \$75 million.²

Control of the Firm Control of the firm ultimately rests with stockholders. They elect the board of directors, who, in turn, hire and fire management.

An important mechanism by which unhappy stockholders can replace existing management is called a *proxy fight*. A proxy is the authority to vote someone else's stock. A proxy fight develops when a group solicits proxies in order to replace the existing board and thereby replace existing management. For example, during 2013 and 2014, New York hedge fund Starboard Value was in a protracted battle with Darden Restaurants, operator of chains such as Red Lobster and Olive Garden. Starboard had problems with Olive Garden's restaurant operations, such as the fact that Olive Garden stopped putting salt in its seasoned pasta water in order to extend the warranty on its cooking pots. In October 2014, the proxy battle ended when Starboard convinced enough shareholders to vote to replace all 12 members of Darden's board of directors. Although replacing an entire board of directors does happen, it usually occurs with smaller companies. This episode was unique because Darden is the largest full-service restaurant company in the U.S., with 2013 sales of \$8.55 billion.

Another way that management can be replaced is by takeover. Firms that are poorly managed are more attractive as acquisitions than well-managed firms because a greater profit potential exists. Thus, avoiding a takeover by another firm gives management another incentive to act in the stockholders' interests. Unhappy prominent shareholders can suggest different business strategies to a firm's top management. For example, in the chapter opener, we discussed George Zimmer's firing by the board of The Men's Wearhouse. A few months later, rival Jos. A. Bank made a bid to buy the company, despite the fact that Bank was a significantly smaller firm. The offer was rejected. But, in an interesting turn of events, The Men's Wearhouse offered to buy Jos. A. Bank! After months of back and forth, the two companies announced in March 2014 that a deal had

²This raises the issue of the level of top management pay and its relationship to other employees. According to the *Economic Policy Institute*, the average CEO compensation was greater than 296 times the average employee compensation in 2013 and only 30 times in 1978. However, there is no precise formula that governs the gap between top management compensation and that of employees.



been finalized, with The Men's Wearhouse buying Jos. A. Bank for \$65 per share. That price was about 38 percent higher than Bank's stock price when talks began, so The Men's Wearhouse made an excellent "suit-or."

Conclusion The available theory and evidence are consistent with the view that stockholders control the firm and that stockholder wealth maximization is the relevant goal of the corporation. Even so, there will undoubtedly be times when management goals are pursued at the expense of the stockholders, at least temporarily.

STAKEHOLDERS

Our discussion thus far implies that management and stockholders are the only parties with an interest in the firm's decisions. This is an oversimplification, of course. Employees, customers, suppliers, and even the government all have a financial interest in the firm.

Taken together, these various groups are called **stakeholders** in the firm. In general, a stakeholder is someone other than a stockholder or creditor who potentially has a claim on the cash flows of the firm. Such groups will also attempt to exert control over the firm, perhaps to the detriment of the owners.

1.6 Regulation

Until now, we have talked mostly about the actions that shareholders and boards of directors can take to reduce the conflicts of interest between themselves and management. We have not talked about regulation.³ Until recently the main thrust of federal regulation has been to require that companies disclose all relevant information to investors and potential investors. Disclosure of relevant information by corporations is intended to put all investors on a level information playing field and, thereby to reduce conflicts of interest. Of course, regulation imposes costs on corporations and any analysis of regulation must include both benefits and costs.

THE SECURITIES ACT OF 1933 AND THE SECURITIES EXCHANGE ACT OF 1934

The Securities Act of 1933 (the 1933 Act) and the Securities Exchange Act of 1934 (the 1934 Act) provide the basic regulatory framework in the United States for the public trading of securities.

The 1933 Act focuses on the issuing of new securities. Basically, the 1933 Act requires a corporation to file a registration statement with the Securities and Exchange Commission (SEC) that must be made available to every buyer of a new security. The intent of the registration statement is to provide potential stockholders with all the necessary information to make a reasonable decision. The 1934 Act extends the disclosure requirements of the 1933 Act to securities trading in markets after they have been issued. The 1934 Act establishes the SEC and covers a large number of issues including corporate reporting, tender offers, and insider trading. The 1934 Act requires corporations to file reports to the SEC on an annual basis (Form 10K), on a quarterly basis (Form 10Q), and on a monthly basis (Form 8K).

³At this stage in our book, we focus on the regulation of corporate governance. We do not talk about many other regulators in financial markets not to mention non-financial markets such as the Federal Reserve Board. In Chapter 8, we discuss the nationally recognized statistical rating organizations (NRSROs) in the United States. These include Fitch Ratings, Moody's, and Standard & Poor's. Their ratings are used by market participants to help value securities such as corporate bonds. Many critics of the rating agencies blame the 2007–2009 subprime credit crisis on weak regulatory oversight of these agencies.

As mentioned, the 1934 Act deals with the important issue of insider trading. Illegal insider trading occurs when any person who has acquired nonpublic, special information (i.e., inside information) buys or sells securities based upon that information. One section of the 1934 Act deals with insiders such as directors, officers, and large shareholders, while another deals with any person who has acquired inside information. The intent of these sections of the 1934 Act is to prevent insiders or persons with inside information from taking unfair advantage of this information when trading with outsiders.

To illustrate, suppose you learned that ABC firm was about to publicly announce that it had agreed to be acquired by another firm at a price significantly greater than its current price. This is an example of inside information. The 1934 Act prohibits you from buying ABC stock from shareholders who do not have this information. This prohibition would be especially strong if you were the CEO of the ABC firm. Other kinds of inside information could be knowledge of an initial dividend about to be paid, the discovery of a drug to cure cancer, or the default of a debt obligation.

SARBANES-OXLEY

In response to corporate scandals at companies such as Enron, WorldCom, Tyco, and Adelphia, Congress enacted the Sarbanes-Oxley Act in 2002. The act, better known as “Sarbox,” is intended to protect investors from corporate abuses. For example, one section of Sarbox prohibits personal loans from a company to its officers, such as the ones that were received by WorldCom CEO Bernie Ebbers.

One of the key sections of Sarbox took effect on November 15, 2004. Section 404 requires, among other things, that each company’s annual report must have an assessment of the company’s internal control structure and financial reporting. The auditor must then evaluate and attest to management’s assessment of these issues. Sarbox also creates the Public Companies Accounting Oversight Board (PCAOB) to establish new audit guidelines and ethical standards. It requires public companies’ audit committees of corporate boards to include only independent, outside directors to oversee the annual audits and disclose if the committees have a financial expert (and if not, why not).

Sarbox contains other key requirements. For example, the officers of the corporation must review and sign the annual reports. They must explicitly declare that the annual report does not contain any false statements or material omissions; that the financial statements fairly represent the financial results; and that they are responsible for all internal controls. Finally, the annual report must list any deficiencies in internal controls. In essence, Sarbox makes company management responsible for the accuracy of the company’s financial statements.

Of course, as with any law, there are costs. Sarbox has increased the expense of corporate audits, sometimes dramatically. In 2004, the average compliance cost for large firms was \$4.51 million, although costs have dropped significantly since then. This added expense has led to several unintended results. For example, in 2003, 198 firms delisted their shares from exchanges, or “went dark,” and about the same number delisted in 2004. Both numbers were up from 30 delistings in 1999. Many of the companies that delisted stated the reason was to avoid the cost of compliance with Sarbox.⁴

A company that goes dark does not have to file quarterly or annual reports. Annual audits by independent auditors are not required, and executives do not have to certify the

For an annual survey of Sarbox costs, see www.protiviti.com/en-US/Documents/Surveys/2014-SOX-Compliance-Survey-Protiviti.pdf.

⁴But in “Has New York Become Less Competitive in Global Markets? Evaluating Foreign Listing Choices Over Time” *Journal of Financial Economics*, Volume 91, Issue 3, March 2009, pp. 253–77, Craig Doidge, Andrew Karolyi, and René Stulz find that the decline in delistings is not directly related to Sarbanes-Oxley. They conclude that most New York delisting was because of mergers and acquisitions, distress, and restructuring.



accuracy of the financial statements, so the savings can be huge. Of course, there are costs. Stock prices typically fall when a company announces it is going dark. Further, such companies will typically have limited access to capital markets and usually will have a higher interest cost on bank loans.

Sarbox has also probably affected the number of companies choosing to go public in the United States. For example, when Peach Holdings, based in Boynton Beach, Florida, decided to go public in 2006, it shunned the U.S. stock markets, instead choosing the London Stock Exchange's Alternative Investment Market (AIM). To go public in the United States, the firm would have paid a \$100,000 fee, plus about \$2 million to comply with Sarbox. Instead, the company spent only \$500,000 on its AIM stock offering.

Summary and Conclusions

This chapter introduced you to some of the basic ideas in corporate finance:

1. Corporate finance has three main areas of concern:
 - a. *Capital budgeting*: What long-term investments should the firm take?
 - b. *Capital structure*: Where will the firm get the long-term financing to pay for its investments? Also, what mixture of debt and equity should it use to fund operations?
 - c. *Working capital management*: How should the firm manage its everyday financial activities?
2. The goal of financial management in a for-profit business is to make decisions that increase the value of the stock, or, more generally, increase the value of the equity.
3. The corporate form of organization is superior to other forms when it comes to raising money and transferring ownership interests, but it has the significant disadvantage of double taxation.
4. There is the possibility of conflicts between stockholders and management in a large corporation. We called these conflicts *agency problems* and discussed how they might be controlled and reduced.
5. The advantages of the corporate form are enhanced by the existence of financial markets.

Of the topics we've discussed thus far, the most important is the goal of financial management: maximizing the value of the stock. Throughout the text we will be analyzing many different financial decisions, but we will always ask the same question: How does the decision under consideration affect the value of the stock?

Concept Questions

1. **Agency Problems** Who owns a corporation? Describe the process whereby the owners control the firm's management. What is the main reason that an agency relationship exists in the corporate form of organization? In this context, what kinds of problems can arise?
2. **Not-for-Profit Firm Goals** Suppose you were the financial manager of a not-for-profit business (a not-for-profit hospital, perhaps). What kinds of goals do you think would be appropriate?

3. **Goal of the Firm** Evaluate the following statement: Managers should not focus on the current stock value because doing so will lead to an overemphasis on short-term profits at the expense of long-term profits.
4. **Ethics and Firm Goals** Can the goal of maximizing the value of the stock conflict with other goals, such as avoiding unethical or illegal behavior? In particular, do you think subjects like customer and employee safety, the environment, and the general good of society fit in this framework, or are they essentially ignored? Think of some specific scenarios to illustrate your answer.
5. **International Firm Goal** Would the goal of maximizing the value of the stock differ for financial management in a foreign country? Why or why not?
6. **Agency Problems** Suppose you own stock in a company. The current price per share is \$25. Another company has just announced that it wants to buy your company and will pay \$35 per share to acquire all the outstanding stock. Your company's management immediately begins fighting off this hostile bid. Is management acting in the shareholders' best interests? Why or why not?
7. **Agency Problems and Corporate Ownership** Corporate ownership varies around the world. Historically, individuals have owned the majority of shares in public corporations in the United States. In Germany and Japan, however, banks, other large financial institutions, and other companies own most of the stock in public corporations. Do you think agency problems are likely to be more or less severe in Germany and Japan than in the United States?
8. **Agency Problems and Corporate Ownership** In recent years, large financial institutions such as mutual funds and pension funds have become the dominant owners of stock in the United States, and these institutions are becoming more active in corporate affairs. What are the implications of this trend for agency problems and corporate control?
9. **Executive Compensation** Critics have charged that compensation to top managers in the United States is simply too high and should be cut back. For example, focusing on large corporations, Larry Ellison of Oracle has been one of the best-compensated CEOs in the United States, earning about \$76.9 million in 2013. Are such amounts excessive? In answering, it might be helpful to recognize that superstar athletes such as Cristiano Ronaldo, top earners in the entertainment field such as James Cameron and Oprah Winfrey, and many others at the top of their respective fields earn at least as much, if not a great deal more.
10. **Goal of Financial Management** Why is the goal of financial management to maximize the current value of the company's stock? In other words, why isn't the goal to maximize the future value?

2

Financial Statements and Cash Flow

A write-off by a company frequently means that the value of the company's assets has declined. For example, in July 2014, Ford Motor announced that it was writing off \$329 million of the company's investment in Ford Sollers, a joint venture to manufacture Ford cars in Russia. The joint venture had begun in October 2011, but over its less than three-year existence, Ford management came to view the joint venture as problematic. Also in 2014, Maersk Oil announced that

it was writing off \$1.7 billion related to two Brazilian oil fields, and Royal Dutch Shell wrote off \$1.9 billion related to U.S. natural gas assets.

So did stockholders in these companies lose billions of dollars because of the write-offs? The answer is probably not. Understanding why ultimately leads us to the main subject of this chapter: that all-important substance known as *cash flow*.

2.1 The Balance Sheet



The **balance sheet** is an accountant's snapshot of a firm's accounting value on a particular date, as though the firm stood momentarily still. The balance sheet has two sides: On the left are the *assets* and on the right are the *liabilities* and *stockholders' equity*. The balance sheet states what the firm owns and how it is financed. The accounting definition that underlies the balance sheet and describes the balance is:

$$\text{Assets} \equiv \text{Liabilities} + \text{Stockholders' equity}$$

We have put a three-line equality in the balance equation to indicate that it must always hold, by definition. In fact, the stockholders' equity is *defined* to be the difference between the assets and the liabilities of the firm. In principle, equity is what the stockholders would have remaining after the firm discharged its obligations.

Table 2.1 gives the 2015 and 2014 balance sheet for the fictitious U.S. Composite Corporation. The assets in the balance sheet are listed in order by the length of time it normally would take an ongoing firm to convert them into cash. The asset side depends on the nature of the business and how management chooses to conduct it. Management must make decisions about cash versus marketable securities, credit versus cash sales, whether to make or buy commodities, whether to lease or purchase items, the types of business in which to engage, and so on. The liabilities and the stockholders' equity are listed in the order in which they would typically be paid over time.

Two excellent sources for company financial information are finance.yahoo.com and money.cnn.com.

Table 2.1 The Balance Sheet of the U.S. Composite Corporation

U.S. COMPOSITE CORPORATION					
Balance Sheet					
2015 and 2014					
(\$ in millions)					
Assets	2015	2014	Liabilities (Debt) and Stockholders' Equity	2015	2014
Current assets:			Current liabilities:		
Cash and equivalents	\$ 198	\$ 157	Accounts payable	\$ 486	\$ 455
Accounts receivable	294	270	Total current liabilities	<u>\$ 486</u>	<u>\$ 455</u>
Inventory	269	280	Long-term liabilities:		
Total current assets	<u>\$ 761</u>	<u>\$ 707</u>	Deferred taxes	\$ 117	\$ 104
Fixed assets:			Long-term debt*	471	458
Property, plant, and equipment	\$1,423	\$1,274	Total long-term liabilities	<u>\$ 588</u>	<u>\$ 562</u>
Less accumulated depreciation	550	460	Stockholders' equity:		
Net property, plant, and equipment	873	814	Preferred stock	\$ 39	\$ 39
Intangible assets and others	245	221	Common stock (\$1 par value)	55	32
Total fixed assets	<u>\$1,118</u>	<u>\$1,035</u>	Capital surplus	347	327
			Accumulated retained earnings	390	347
			Less treasury stock†	26	20
			Total equity	<u>\$ 805</u>	<u>\$ 725</u>
			Total liabilities and stockholders' equity‡	<u>\$1,879</u>	<u>\$1,742</u>
Total assets	<u>\$1,879</u>	<u>\$1,742</u>			

*Long-term debt rose by \$471 million – \$458 million = \$13 million. This is the difference between \$86 million new debt and \$73 million in retirement of old debt.

†Treasury stock rose by \$6 million. This reflects the repurchase of \$6 million of U.S. Composite's company stock.

‡U.S. Composite reports \$43 million in new equity. The company issued 23 million shares at a price of \$1.87. The par value of common stock increased by \$23 million, and capital surplus increased by \$20 million.

The liabilities and stockholders' equity side reflects the types and proportions of financing, which depend on management's choice of capital structure, as between debt and equity and between current debt and long-term debt.

When analyzing a balance sheet, the financial manager should be aware of three concerns: liquidity, debt versus equity, and value versus cost.

Annual and quarterly financial statements for most public U.S. corporations can be found in the EDGAR database at www.sec.gov.

LIQUIDITY

Liquidity refers to the ease and quickness with which assets can be converted to cash (without significant loss in value). *Current assets* are the most liquid and include cash and assets that will be turned into cash within a year from the date of the balance sheet. *Accounts receivable* are amounts not yet collected from customers for goods or services sold to them (after adjustment for potential bad debts). *Inventory* is composed of raw materials to be used in production, work in process, and finished goods. *Fixed assets* are the least liquid kind of assets. Tangible fixed assets include property, plant, and equipment. These assets do not convert to cash from normal business activity, and they are not usually used to pay expenses such as payroll.



Some fixed assets are not tangible. Intangible assets have no physical existence but can be very valuable. Examples of intangible assets are the value of a trademark or the value of a patent. The more liquid a firm's assets, the less likely the firm is to experience problems meeting short-term obligations. Thus, the probability that a firm will avoid financial distress can be linked to the firm's liquidity. Unfortunately, liquid assets frequently have lower rates of return than fixed assets; for example, cash generates no investment income. To the extent a firm invests in liquid assets, it sacrifices an opportunity to invest in potentially more profitable investment vehicles.

DEBT VERSUS EQUITY

Liabilities are obligations of the firm that require a payout of cash within a stipulated period. Many liabilities involve contractual obligations to repay a stated amount and interest over a period. Thus, liabilities are debts and are frequently associated with nominally fixed cash burdens, called *debt service*, that put the firm in default of a contract if they are not paid. *Stockholders' equity* is a claim against the firm's assets that is residual and not fixed. In general terms, when the firm borrows, it gives the bondholders first claim on the firm's cash flow.¹ Bondholders can sue the firm if the firm defaults on its bond contracts. This may lead the firm to declare itself bankrupt. Stockholders' equity is the residual difference between assets and liabilities:

$$\text{Assets} - \text{Liabilities} \equiv \text{Stockholders' equity}$$

This is the stockholders' share in the firm stated in accounting terms. The accounting value of stockholders' equity increases when retained earnings are added. This occurs when the firm retains part of its earnings instead of paying them out as dividends.

VALUE VERSUS COST

The accounting value of a firm's assets is frequently referred to as the *carrying value* or the *book value* of the assets.² Under **generally accepted accounting principles (GAAP)**, audited financial statements of firms in the United States carry the assets at cost.³ Thus the terms *carrying value* and *book value* are unfortunate. They specifically say "value," when in fact the accounting numbers are based on cost. This misleads many readers of financial statements to think that the firm's assets are recorded at true market values. *Market value* is the price at which willing buyers and sellers would trade the assets. It would be only a coincidence if accounting value and market value were the same. In fact, management's job is to create value for the firm that exceeds its cost.

Many people use the balance sheet, but the information each may wish to extract is not the same. A banker may look at a balance sheet for evidence of accounting liquidity and working capital. A supplier may also note the size of accounts payable and therefore the general promptness of payments. Many users of financial statements, including managers and investors, want to know the value of the firm, not its cost. This information is not found on the balance sheet. In fact, many of the true resources of the firm do not appear on the balance sheet: good management, proprietary assets, favorable economic conditions, and so on. Henceforth,

¹Bondholders are investors in the firm's debt. They are creditors of the firm. In this discussion, the term *bondholder* means the same thing as *creditor*.

²Confusion often arises because many financial accounting terms have the same meaning. This presents a problem with jargon for the reader of financial statements. For example, the following terms usually refer to the same thing: *assets minus liabilities*, *net worth*, *stockholders' equity*, *owners' equity*, *book equity*, and *equity capitalization*.

³Generally, GAAP requires assets to be carried at the lower of cost or market value. In most instances, cost is lower than market value. However, in some cases when a fair market value can be readily determined, the assets have their value adjusted to the fair market value.

whenever we speak of the value of an asset or the value of the firm, we will normally mean its market value. So, for example, when we say the goal of the financial manager is to increase the value of the stock, we usually mean the market value of the stock not the book value.

With the increasing globalization of business, there has been a growing need to make accounting standards more comparable across countries. In recent years, U.S. accounting standards have become more closely tied to International Financial Reporting Standards (IFRS). In particular, the Financial Accounting Standards Board, which is in charge of GAAP policies, and the International Accounting Standards Board, in charge of IFRS policies, have been working toward convergence of policies. Although GAAP and IFRS have become similar in several areas, as of late 2014, it appears that a full convergence of accounting policies is off the table, at least for now.

For more information about IFRS, check out the website www.ifrs.org.

EXAMPLE 2.1

Market Value versus Book Value The Cooney Corporation has fixed assets with a book value of \$700 and an appraised market value of about \$1,000. Net working capital is \$400 on the books, but approximately \$600 would be realized if all the current accounts were liquidated. Cooney has \$500 in long-term debt, both book value and market value. What is the book value of the equity? What is the market value?

We can construct two simplified balance sheets, one in accounting (book value) terms and one in economic (market value) terms:

COONEY CORPORATION					
Balance Sheets					
Market Value versus Book Value					
Assets			Liabilities and Shareholders' Equity		
	Book	Market		Book	Market
Net working capital	\$ 400	\$ 600	Long-term debt	\$ 500	\$ 500
Net fixed assets	<u>700</u>	<u>1,000</u>	Shareholders' equity	<u>600</u>	<u>1,100</u>
	<u>\$1,100</u>	<u>\$1,600</u>		<u>\$1,100</u>	<u>\$1,600</u>

In this example, shareholders' equity is actually worth almost twice as much as what is shown on the books. The distinction between book and market values is important precisely because book values can be so different from market values.

2.2 The Income Statement



The **income statement** measures performance over a specific period—say a year. The accounting definition of income is:

$$\text{Revenue} - \text{Expenses} = \text{Income}$$

If the balance sheet is like a snapshot, the income statement is like a video recording of what the company did between two snapshots. Table 2.2 gives the income statement for the U.S. Composite Corporation for 2015.

The income statement usually includes several sections. The operations section reports the firm's revenues and expenses from principal operations. One number of



Table 2.2
The Income
Statement of the
U.S. Composite
Corporation

U.S. COMPOSITE CORPORATION	
Income Statement	
2015	
(\$ in millions)	
Total operating revenues	\$2,262
Cost of goods sold	1,655
Selling, general, and administrative expenses	327
Depreciation	90
Operating income	\$ 190
Other income	29
Earnings before interest and taxes (EBIT)	\$ 219
Interest expense	49
Pretax income	\$ 170
Taxes	84
Current: \$71	
Deferred: 13	
Net income	<u>\$ 86</u>
Addition to retained earnings:	<u>\$ 43</u>
Dividends:	43

NOTE: There are 29 million shares outstanding. Earnings per share and dividends per share can be calculated as follows:

$$\begin{aligned} \text{Earnings per share} &= \frac{\text{Net income}}{\text{Total shares outstanding}} \\ &= \frac{\$86}{29} \\ &= \$2.97 \text{ per share} \end{aligned}$$

$$\begin{aligned} \text{Dividends per share} &= \frac{\text{Dividends}}{\text{Total shares outstanding}} \\ &= \frac{\$43}{29} \\ &= \$1.48 \text{ per share} \end{aligned}$$

particular importance is earnings before interest and taxes (EBIT), which summarizes earnings before taxes and financing costs. Among other things, the nonoperating section of the income statement includes all financing costs, such as interest expense. Usually a second section reports as a separate item the amount of taxes levied on income. The last item on the income statement is the bottom line, or net income. Net income is frequently expressed per share of common stock—that is, earnings per share.

When analyzing an income statement, the financial manager should keep in mind GAAP, noncash items, time, and costs.

GENERALLY ACCEPTED ACCOUNTING PRINCIPLES

Revenue is recognized on an income statement when the earnings process is virtually completed and an exchange of goods or services has occurred. Therefore, the unrealized appreciation from owning property will not be recognized as income. This provides a device for smoothing income by selling appreciated property at convenient times. For example, if the firm owns a tree farm that has doubled in value, then, in a year when its earnings from other businesses are down, it can raise overall earnings by selling some

trees. The matching principle of GAAP dictates that revenues be matched with expenses. Thus, income is reported when it is earned, or accrued, even though no cash flow has necessarily occurred (e.g., when goods are sold for credit, sales and profits are reported).

NONCASH ITEMS

The economic value of assets is intimately connected to their future incremental cash flows. However, cash flow does not appear on an income statement. There are several **noncash items** that are expenses against revenues but do not affect cash flow. The most important of these is *depreciation*. Depreciation reflects the accountant's estimate of the cost of equipment used up in the production process. For example, suppose an asset with a five-year life and no resale value is purchased for \$1,000. According to accountants, the \$1,000 cost must be expensed over the useful life of the asset. If straight-line depreciation is used, there will be five equal installments, and \$200 of depreciation expense will be incurred each year. From a finance perspective, the cost of the asset is the actual negative cash flow incurred when the asset is acquired (i.e., \$1,000, *not* the accountant's smoothed \$200-per-year depreciation expense).

Another noncash expense is *deferred taxes*. Deferred taxes result from differences between accounting income and true taxable income.⁴ Notice that the accounting tax shown on the income statement for the U.S. Composite Corporation is \$84 million. It can be broken down as current taxes and deferred taxes. The current tax portion is actually sent to the tax authorities (e.g., the Internal Revenue Service). The deferred tax portion is not. However, the theory is that if taxable income is less than accounting income in the current year, it will be more than accounting income later on. Consequently, the taxes that are not paid today will have to be paid in the future, and they represent a liability of the firm. This shows up on the balance sheet as deferred tax liability. From the cash flow perspective, though, deferred tax is not a cash outflow.

In practice, the difference between cash flows and accounting income can be quite dramatic, so it is important to understand the difference. For example, in the second quarter of 2014, Hecla Mining announced a net loss of \$14.5 million. Sounds bad, but the company also reported a positive cash flow of \$26.6 million, a difference of \$41.1 million.

TIME AND COSTS

It is often useful to visualize all of future time as having two distinct parts, the *short run* and the *long run*. The short run is the period in which certain equipment, resources, and commitments of the firm are fixed; but the time is long enough for the firm to vary its output by using more labor and raw materials. The short run is not a precise period that will be the same for all industries. However, all firms making decisions in the short run have some fixed costs—that is, costs that will not change because of fixed commitments. In real business activity, examples of fixed costs are bond interest, overhead, and property taxes. Costs that are not fixed are variable. Variable costs change as the output of the firm changes; some examples are raw materials and wages for laborers on the production line.

In the long run, all costs are variable. Financial accountants do not distinguish between variable costs and fixed costs. Instead, accounting costs usually fit into a classification that distinguishes product costs from period costs. Product costs are the total production costs incurred during a period—raw materials, direct labor, and manufacturing overhead—and are reported on the income statement as cost of goods sold. Both variable and fixed costs are included in product costs. Period costs are costs that are allocated to a time period; they are called *selling, general, and administrative expenses*. One period cost would be the company president's salary.

⁴One situation in which taxable income may be lower than accounting income is when the firm uses accelerated depreciation expense procedures for the IRS but uses straight-line procedures allowed by GAAP for reporting purposes.



2.3 Taxes



Taxes can be one of the largest cash outflows a firm experiences. In 2013, according to the Department of Commerce, total corporate profits before taxes in the United States were about \$2.17 trillion, and taxes on corporate profits were about \$474 billion or about 22 percent of pretax profits. The size of the firm's tax bill is determined by the tax code, an often amended set of rules. In this section, we examine corporate tax rates and how taxes are calculated.

If the various rules of taxation seem a little bizarre or convoluted to you, keep in mind that the tax code is the result of political, not economic, forces. As a result, there is no reason why it has to make economic sense. To put the complexity of corporate taxation into perspective, General Electric's 2011 tax return required 57,000 pages, far too much to print.

CORPORATE TAX RATES

Corporate tax rates in effect for 2015 are shown in Table 2.3. A peculiar feature of taxation instituted by the Tax Reform Act of 1986 and expanded in the 1993 Omnibus Budget Reconciliation Act is that corporate tax rates are not strictly increasing. As shown, corporate tax rates rise from 15 percent to 39 percent, but they drop back to 34 percent on income over \$335,000. They then rise to 38 percent and subsequently fall to 35 percent.

According to the originators of the current tax rules, there are only four corporate rates: 15 percent, 25 percent, 34 percent, and 35 percent. The 38 and 39 percent brackets arise because of "surcharges" applied on top of the 34 and 35 percent rates. A tax is a tax, however, so there are really six corporate tax brackets, as we have shown.

AVERAGE VERSUS MARGINAL TAX RATES

In making financial decisions, it is frequently important to distinguish between average and marginal tax rates. Your **average tax rate** is your tax bill divided by your taxable income—in other words, the percentage of your income that goes to pay taxes. Your **marginal tax rate** is the tax you would pay (in percent) if you earned one more dollar. The percentage tax rates shown in Table 2.3 are all marginal rates. Put another way, the tax rates apply to the part of income in the indicated range only, not all income.

The difference between average and marginal tax rates can best be illustrated with a simple example. Suppose our corporation has a taxable income of \$200,000. What is the tax bill? Using Table 2.3, we can figure our tax bill like this:

Table 2.3

Corporate Tax Rates

Taxable Income	Tax Rate
\$ 0– 50,000	15%
50,001– 75,000	25
75,001– 100,000	34
100,001– 335,000	39
335,001–10,000,000	34
10,000,001–15,000,000	35
15,000,001–18,333,333	38
18,333,334+	35

$$\begin{aligned}
 .15(\$ 50,000) &= \$ 7,500 \\
 .25(\$ 75,000 - 50,000) &= 6,250 \\
 .34(\$100,000 - 75,000) &= 8,500 \\
 .39(\$200,000 - 100,000) &= \underline{39,000} \\
 &= \underline{\underline{\$61,250}}
 \end{aligned}$$

Our total tax is thus \$61,250.

In our example, what is the average tax rate? We had a taxable income of \$200,000 and a tax bill of \$61,250, so the average tax rate is $\$61,250/200,000 = 30.625\%$. What is the marginal tax rate? If we made one more dollar, the tax on that dollar would be 39 cents, so our marginal rate is 39 percent.

The IRS has a great website:
www.irs.gov.

EXAMPLE 4.2

Deep in the Heart of Taxes Algernon, Inc., has a taxable income of \$85,000. What is its tax bill? What is its average tax rate? Its marginal tax rate?

From Table 2.3, we see that the tax rate applied to the first \$50,000 is 15 percent; the rate applied to the next \$25,000 is 25 percent; and the rate applied after that up to \$100,000 is 34 percent. So Algernon must pay $.15 \times \$50,000 + .25 \times 25,000 + .34 \times (85,000 - 75,000) = \$17,150$. The average tax rate is thus $\$17,150/85,000 = 20.18\%$. The marginal rate is 34 percent because Algernon's taxes would rise by 34 cents if it had another dollar in taxable income.

Table 2.4 summarizes some different taxable incomes, marginal tax rates, and average tax rates for corporations. Notice how the average and marginal tax rates come together at 35 percent.

With a *flat-rate* tax, there is only one tax rate, so the rate is the same for all income levels. With such a tax, the marginal tax rate is always the same as the average tax rate. As it stands now, corporate taxation in the United States is based on a modified flat-rate tax, which becomes a true flat rate for the highest incomes.

In looking at Table 2.4, notice that the more a corporation makes, the greater is the percentage of taxable income paid in taxes. Put another way, under current tax law, the average tax rate never goes down, even though the marginal tax rate does. As illustrated, for corporations, average tax rates begin at 15 percent and rise to a maximum of 35 percent.

Normally, the marginal tax rate will be relevant for financial decision making. The reason is that any new cash flows will be taxed at that marginal rate. Because financial

Table 2.4
Corporate Taxes
and Tax Rates

	(1) Taxable Income	(2) Marginal Tax Rate	(3) Total Tax	(3)/(1) Average Tax Rate
\$	45,000	15%	\$ 6,750	15.00%
	70,000	25	12,500	17.86
	95,000	34	20,550	21.63
	250,000	39	80,750	32.30
	1,000,000	34	340,000	34.00
	17,500,000	38	6,100,000	34.86
	50,000,000	35	17,500,000	35.00
	100,000,000	35	35,000,000	35.00



Table 2.5
Average Corporate
Tax Rates

Industry	Number of Companies	Average Tax Rate
Electric utilities (eastern U.S.)	24	33.8%
Trucking	33	32.7
Railroad	15	27.4
Securities brokerage	30	20.5
Banking	481	17.5
Medical supplies	264	11.2
Internet	239	5.9
Pharmaceutical	337	5.6
Biotechnology	121	4.5

decisions usually involve new cash flows or changes in existing ones, this rate will tell us the marginal effect of a decision on our tax bill.

There is one last thing to notice about the tax code as it affects corporations. It's easy to verify that the corporate tax bill is just a flat 35 percent of taxable income if our taxable income is more than \$18.33 million. Also, for the many midsize corporations with taxable incomes in the range of \$335,000 to \$10,000,000, the tax rate is a flat 34 percent. Because we will usually be talking about large corporations, you can assume that the average and marginal tax rates are 35 percent unless we explicitly say otherwise.

We should note that we have simplified the U.S. tax code for presentation purposes. In actuality, the tax code is much more complex, with various tax deductions and loopholes allowed for certain industries, as well as the taxation of multinational companies. In reality, recent evidence shows that the average tax rate can be far from 35 percent for many companies. Table 2.5 shows average tax rates for several industries. As you can see, the average tax rate ranges from 33.8 percent for electric utilities to 4.5 percent for biotechnology firms.

Before moving on, we should note that the tax rates we have discussed in this section relate to federal taxes only. Overall tax rates can be higher if state, local, and any other taxes are considered.

2.4 Net Working Capital



Net working capital is current assets minus current liabilities. Net working capital is positive when current assets are greater than current liabilities. This means the cash that will become available over the next 12 months will be greater than the cash that must be paid out. The net working capital of the U.S. Composite Corporation is \$275 million in 2015 and \$252 million in 2014.

	Current assets (\$ millions)	–	Current liabilities (\$ millions)	=	Net working capital (\$ millions)
2015	\$761	–	\$486	=	\$275
2014	707	–	455	=	252

In addition to investing in fixed assets (i.e., capital spending), a firm can invest in net working capital. This is called the **change in net working capital**. The change in net working capital in 2015 is the difference between the net working capital in 2015 and 2014—that is,

\$275 million – \$252 million = \$23 million. The change in net working capital is usually positive in a growing firm.⁵

2.5 Cash Flow of the Firm



Perhaps the most important item that can be extracted from financial statements is the actual **cash flow** of the firm. An official accounting statement called the *statement of cash flows* helps to explain the change in accounting cash and equivalents, which for U.S. Composite is \$33 million in 2015. (See Section 2.6.) Notice in Table 2.1 that cash and equivalents increase from \$107 million in 2014 to \$140 million in 2015. However, we will look at cash flow from a different perspective: the perspective of finance. In finance, the value of the firm is its ability to generate financial cash flow. (We will talk more about financial cash flow in a later chapter.)

The first point we should mention is that cash flow is not the same as net working capital. For example, increasing inventory requires using cash. Because both inventories and cash are current assets, this does not affect net working capital. In this case, an increase in inventory is associated with decreasing cash flow.

Just as we established that the value of a firm's assets is always equal to the combined value of the liabilities and the value of the equity, the cash flows received from the firm's assets (i.e., its operating activities), $CF(A)$, must equal the cash flows to the firm's creditors, $CF(B)$, and equity investors, $CF(S)$:

$$CF(A) \equiv CF(B) + CF(S)$$

The first step in determining cash flows of the firm is to figure out the *cash flow from operations*. As can be seen in Table 2.6, operating cash flow is the cash flow generated by business activities, including sales of goods and services. Operating cash flow reflects tax payments, but not financing, capital spending, or changes in net working capital:

\$ in millions	
Earnings before interest and taxes	\$219
Depreciation	90
Current taxes	<u>-71</u>
Operating cash flow	<u>\$238</u>

Another important component of cash flow involves *changes in fixed assets*. For example, when U.S. Composite sold its power systems subsidiary in 2015, it generated \$25 million in cash flow. The net change in fixed assets equals the acquisition of

⁵A firm's current liabilities sometimes include short-term interest bearing debt usually referred to as *notes payable*. However, financial analysts often distinguish between interest bearing short-term debt and noninterest bearing short-term debt (such as accounts payable). When this distinction is made, only noninterest bearing short-term debt is usually included in the calculation of net working capital. This version of net working capital is called "operating" net working capital. The interest bearing short-term debt is not forgotten but instead is included in cash flow from financing activities, and the interest is considered a return on capital.

Financial analysts also sometimes exclude "excess" cash and short-term investments from the calculation of net working capital because this excess could represent a temporary imbalance to a firm's cash flow and may not be directly related to a firm's normal operating or financing activities.



Table 2.6
Financial Cash
Flow of the
U.S. Composite
Corporation

U.S. COMPOSITE CORPORATION	
Cash Flow of the Firm	
2015	
(\$ in millions)	
Cash flow of the firm	
Operating cash flow	\$238
(Earnings before interest and taxes plus depreciation minus taxes)	
Capital spending	– 173
(Acquisitions of fixed assets minus sales of fixed assets)	
Additions to net working capital	–23
Total	<u>\$ 42</u>
Cash flow to investors in the firm	
Debt	\$ 36
(Interest plus retirement of debt minus long-term debt financing)	
Equity	6
(Dividends plus repurchase of equity minus new equity financing)	
Total	<u>\$ 42</u>

fixed assets minus the sales of fixed assets. The result is the cash flow used for capital spending:

Acquisition of fixed assets	\$198	
Sales of fixed assets	<u>–25</u>	
Capital spending	<u>\$173</u>	(\$149 + 24 = Increase in property, plant, and equipment + Increase in intangible assets)

We can also calculate capital spending simply as:

$$\begin{aligned}
 \text{Capital spending} &= \text{Ending net fixed assets} - \text{Beginning net fixed assets} \\
 &\quad + \text{Depreciation} \\
 &= \$1,118 - 1,035 + 90 \\
 &= \$173
 \end{aligned}$$

Cash flows are also used for making investments in net working capital. In U.S. Composite Corporation in 2015, *additions to net working capital* are:

Additions to net working capital	\$23
----------------------------------	------

Note that this \$23 million is the change in net working capital we previously calculated.

Total cash flows generated by the firm's assets are then equal to:

Operating cash flow	\$238
Capital spending	– 173
Additions to net working capital	<u>– 23</u>
Total cash flow of the firm	<u>\$ 42</u>

The total outgoing cash flow of the firm can be separated into cash flow paid to creditors and cash flow paid to stockholders. The cash flow paid to creditors represents a regrouping of the data in Table 2.6 and an explicit recording of interest expense. Creditors are paid an amount generally referred to as *debt service*. Debt service is interest payments plus repayments of principal (i.e., retirement of debt).

An important source of cash flow is the sale of new debt. U.S. Composite's long-term debt increased by \$13 million (the difference between \$86 million in new debt and \$73 million in retirement of old debt).⁶ Thus, an increase in long-term debt is the net effect of new borrowing and repayment of maturing obligations plus interest expense:

Interest	\$ 49
Retirement of debt	<u>73</u>
Debt service	122
Proceeds from long-term debt sales	<u>-86</u>
Total	<u>\$ 36</u>

Cash flow paid to creditors can also be calculated as:

$$\begin{aligned}
 \text{Cash flow paid to creditors} &= \text{Interest paid} - \text{Net new borrowing} \\
 &= \text{Interest paid} - (\text{Ending long-term debt} \\
 &\quad - \text{Beginning long-term debt}) \\
 &= \$49 - (471 - 458) \\
 &= \$36
 \end{aligned}$$

Cash flow of the firm also is paid to the stockholders. It is the net effect of paying dividends plus repurchasing outstanding shares of stock and issuing new shares of stock:

Dividends	\$43
Repurchase of stock	<u>6</u>
Cash to stockholders	49
Proceeds from new stock issue	<u>-43</u>
Total	<u>\$ 6</u>

In general, cash flow to stockholders can be determined as:

$$\begin{aligned}
 \text{Cash flow to stockholders} &= \text{Dividends paid} - \text{Net new equity raised} \\
 &= \text{Dividends paid} - (\text{Stock sold} \\
 &\quad - \text{Stock repurchased})
 \end{aligned}$$

To determine stock sold, first notice that the common stock and capital surplus accounts went up by a combined $\$23 + 20 = \43 , which implies that the company sold \$43 million worth of stock. Second, treasury stock went up by \$6, indicating that the company bought

⁶New debt and the retirement of old debt are usually found in the "notes" to the balance sheet.



back \$6 million worth of stock. Net new equity is thus $\$43 - 6 = \37 . Dividends paid were \$43 million, so the cash flow to stockholders was:

$$\text{Cash flow to stockholders} = \$43 - (43 - 6) = \$6,$$

which is what we previously calculated.

Some important observations can be drawn from our discussion of cash flow:

1. Several types of cash flow are relevant to understanding the financial situation of the firm. **Operating cash flow**, defined as earnings before interest plus depreciation minus taxes, measures the cash generated from operations not counting capital spending or working capital requirements. It is usually positive; a firm is in trouble if operating cash flow is negative for a long time because the firm is not generating enough cash to pay operating costs. **Total cash flow of the firm** includes adjustments for capital spending and additions to net working capital. It will frequently be negative. When a firm is growing at a rapid rate, spending on inventory and fixed assets can be higher than operating cash flow.
2. Net income is not cash flow. The net income of the U.S. Composite Corporation in 2015 was \$86 million, whereas cash flow was \$42 million. The two numbers are not usually the same. In determining the economic and financial condition of a firm, cash flow is more revealing.

A firm's total cash flow sometimes goes by a different name, **free cash flow**. Of course, there is no such thing as "free" cash (we wish!). Instead, the name refers to cash that the firm is free to distribute to creditors and stockholders because it is not needed for working capital or fixed asset investments. For now, we will stick with "total cash flow of the firm" as our label for this important concept because, in practice, there is some variation in exactly how free cash flow is computed. Nonetheless, whenever you hear the phrase "free cash flow," you should understand that what is being discussed is cash flow from assets that can be distributed to investors.

2.6 The Accounting Statement of Cash Flows



As previously mentioned, there is an official accounting statement called the *statement of cash flows*. This statement helps explain the change in accounting cash, which for U.S. Composite is \$33 million in 2015. It is very useful in understanding financial cash flow.

The first step in determining the change in cash is to figure out cash flow from operating activities. This is the cash flow that results from the firm's normal activities in producing and selling goods and services. The second step is to make an adjustment for cash flow from investing activities. The final step is to make an adjustment for cash flow from financing activities. Financing activities are the net payments to creditors and owners (excluding interest expense) made during the year.

The three components of the statement of cash flows are determined next.

CASH FLOW FROM OPERATING ACTIVITIES

To calculate cash flow from operating activities we start with net income. Net income can be found on the income statement and is equal to \$86 million. We now need to add back noncash expenses and adjust for changes in current assets and liabilities (other than cash and notes payable). The result is cash flow from operating activities.

U.S. COMPOSITE CORPORATION	
Cash Flow from Operating Activities	
2015	
(\$ in millions)	
Net income	\$ 86
Depreciation	90
Deferred taxes	13
Change in assets and liabilities	
Accounts receivable	-24
Inventories	11
Accounts payable	31
Cash flow from operating activities	<u>\$207</u>

CASH FLOW FROM INVESTING ACTIVITIES

Cash flow from investing activities involves changes in capital assets: acquisition of fixed assets and sales of fixed assets (i.e., net capital expenditures). The result for U.S. Composite is shown here:

U.S. COMPOSITE CORPORATION	
Cash Flow from Investing Activities	
2015	
(\$ in millions)	
Acquisition of fixed assets	-\$198
Sales of fixed assets	25
Cash flow from investing activities	<u>-\$173</u>

CASH FLOW FROM FINANCING ACTIVITIES

Cash flows to and from creditors and owners include changes in equity and debt:

U.S. COMPOSITE CORPORATION	
Cash Flow from Financing Activities	
2015	
(\$ in millions)	
Retirement of long-term debt	-\$73
Proceeds from long-term debt sales	86
Dividends	-43
Repurchase of stock	-6
Proceeds from new stock issue	43
Cash flow from financing activities	<u>\$ 7</u>



Table 2.7
Statement of
Consolidated
Cash Flows of the
U.S. Composite
Corporation

U.S. COMPOSITE CORPORATION	
Statement of Cash Flows	
2015	
(\$ in millions)	
Operations	
Net income	\$ 86
Depreciation	90
Deferred taxes	13
Changes in assets and liabilities	
Accounts receivable	-24
Inventories	11
Accounts payable	31
Total cash flow from operations	<u>\$207</u>
Investing activities	
Acquisition of fixed assets	-\$198
Sales of fixed assets	25
Total cash flow from investing activities	<u>-\$173</u>
Financing activities	
Retirement of long-term debt	-\$ 73
Proceeds from long-term debt sales	86
Dividends	-43
Repurchase of stock	-6
Proceeds from new stock issue	43
Total cash flow from financing activities	<u>\$ 7</u>
Change in cash (on the balance sheet)	<u>\$ 41</u>

The statement of cash flows is the addition of cash flows from operations, cash flows from investing activities, and cash flows from financing activities, and is produced in Table 2.7. When we add all the cash flows together, we get the change in cash on the balance sheet of \$41 million.

There is a close relationship between the official accounting statement called the statement of cash flows and the total cash flow of the firm used in finance. Going back to the previous section, you should note a slight conceptual problem here. Interest paid should really go under financing activities, but unfortunately that is not how the accounting is handled. The reason is that interest is deducted as an expense when net income is computed. As a consequence, a primary difference between the accounting cash flow and the financial cash flow of the firm (see Table 2.6) is interest expense.

2.7 Cash Flow Management

One of the reasons why cash flow analysis is popular is the difficulty in manipulating, or spinning, cash flows. GAAP accounting principles allow for significant subjective decisions to be made regarding many key areas. The use of cash flow as a metric to evaluate a

company comes from the idea that there is less subjectivity involved, and, therefore, it is harder to spin the numbers. But several recent examples have shown that companies can still find ways to do it.

Tyco used several ploys to alter cash flows. For example, the company purchased more than \$800 million of customer security alarm accounts from dealers. The cash flows from these transactions were reported in the financing activity section of the accounting statement of cash flows. When Tyco received payments from customers, the cash inflows were reported as operating cash flows. Another method used by Tyco was to have acquired companies prepay operating expenses. In other words, the company acquired by Tyco would pay vendors for items not yet received. In one case, the payments totaled more than \$50 million. When the acquired company was consolidated with Tyco, the prepayments reduced Tyco's cash outflows, thus increasing the operating cash flows.

Dynegy, the energy giant, was accused of engaging in a number of complex "round-trip trades." The round-trip trades essentially involved the sale of natural resources to a counterparty, with the repurchase of the resources from the same party at the same price. In essence, Dynegy would sell an asset for \$100, and immediately repurchase it from the buyer for \$100. The problem arose with the treatment of the cash flows from the sale. Dynegy treated the cash from the sale of the asset as an operating cash flow, but classified the repurchase as an investing cash outflow. The total cash flows of the contracts traded by Dynegy in these round-trip trades totaled \$300 million.

Adelphia Communications was another company that apparently manipulated cash flows. In Adelphia's case, the company capitalized the labor required to install cable. In other words, the company classified this labor expense as a fixed asset. While this practice is fairly common in the telecommunications industry, Adelphia capitalized a higher percentage of labor than is common. The effect of this classification was that the labor was treated as an investment cash flow, which increased the operating cash flow.

In each of these examples, the companies were trying to boost operating cash flows by shifting cash flows to a different heading. The important thing to notice is that these movements don't affect the total cash flow of the firm, which is why we recommend focusing on this number, not just operating cash flow.

Summary and Conclusions

Besides introducing you to corporate accounting, the purpose of this chapter has been to teach you how to determine cash flow from the accounting statements of a typical company.

1. Cash flow is generated by the firm and paid to creditors and shareholders. It can be classified as:
 - a. Cash flow from operations.
 - b. Cash flow from changes in fixed assets.
 - c. Cash flow from changes in working capital.
2. Calculations of cash flow are not difficult, but they require care and particular attention to detail in properly accounting for noncash expenses such as depreciation and deferred taxes. It is especially important that you do not confuse cash flow with changes in net working capital and net income.



Concept Questions

1. **Liquidity** True or false: All assets are liquid at some price. Explain.
2. **Accounting and Cash Flows** Why might the revenue and cost figures shown on a standard income statement not represent the actual cash inflows and outflows that occurred during a period?
3. **Accounting Statement of Cash Flows** Looking at the accounting statement of cash flows, what does the bottom line number mean? How useful is this number for analyzing a company?
4. **Cash Flows** How do financial cash flows and the accounting statement of cash flows differ? Which is more useful for analyzing a company?
5. **Book Values versus Market Values** Under standard accounting rules, it is possible for a company's liabilities to exceed its assets. When this occurs, the owners' equity is negative. Can this happen with market values? Why or why not?
6. **Cash Flow from Assets** Why is it not necessarily bad for the cash flow from assets to be negative for a particular period?
7. **Operating Cash Flow** Why is it not necessarily bad for the operating cash flow to be negative for a particular period?
8. **Net Working Capital and Capital Spending** Could a company's change in net working capital be negative in a given year? (*Hint: Yes.*) Explain how this might come about. What about net capital spending?
9. **Cash Flow to Stockholders and Creditors** Could a company's cash flow to stockholders be negative in a given year? (*Hint: Yes.*) Explain how this might come about. What about cash flow to creditors?
10. **Firm Values** Referring back to the Ford example at the beginning of the chapter, note that we suggested that Ford's stockholders probably didn't suffer as a result of the reported loss. What do you think was the basis for our conclusion?

Questions and Problems



BASIC
(Questions 1–10)



1. **Building a Balance Sheet** Sankey, Inc., has current assets of \$4,900, net fixed assets of \$25,000, current liabilities of \$4,100, and long-term debt of \$10,300. What is the value of the shareholders' equity account for this firm? How much is net working capital?
2. **Building an Income Statement** Shelton, Inc., has sales of \$435,000, costs of \$216,000, depreciation expense of \$40,000, interest expense of \$21,000, and a tax rate of 35 percent. What is the net income for the firm? Suppose the company paid out \$30,000 in cash dividends. What is the addition to retained earnings?
3. **Market Values and Book Values** Klingon Cruisers, Inc., purchased new cloaking machinery three years ago for \$9.5 million. The machinery can be sold to the Romulans today for \$6.5 million. Klingon's current balance sheet shows net fixed assets of \$5.2 million, current liabilities of \$2.4 million, and net working capital of \$800,000. If all the current assets were liquidated today, the company would receive \$2.6 million cash. What is the book value of Klingon's assets today? What is the market value?



4. **Calculating Taxes** The Stefani Co. had \$198,000 in taxable income. Using the rates from Table 2.3 in the chapter, calculate the company's income taxes. What is the average tax rate? What is the marginal tax rate?
5. **Calculating OCF** Barrett, Inc., has sales of \$19,800, costs of \$10,900, depreciation expense of \$2,100, and interest expense of \$1,250. If the tax rate is 40 percent, what is the operating cash flow, or OCF?
6. **Calculating Net Capital Spending** Gordon Driving School's 2014 balance sheet showed net fixed assets of \$1.32 million, and the 2015 balance sheet showed net fixed assets of \$1.51 million. The company's 2015 income statement showed a depreciation expense of \$137,000. What was the company's net capital spending for 2015?
7. **Building a Balance Sheet** The following table presents the long-term liabilities and stockholders' equity of Information Control Corp. one year ago:

Long-term debt	\$ 55,000,000
Preferred stock	3,100,000
Common stock (\$1 par value)	12,000,000
Accumulated retained earnings	119,000,000
Capital surplus	56,000,000

During the past year, the company issued 5 million shares of new stock at a total price of \$63 million, and issued \$30 million in new long-term debt. The company generated \$8 million in net income and paid \$1.8 million in dividends. Construct the current balance sheet reflecting the changes that occurred at the company during the year.

8. **Cash Flow to Creditors** The 2014 balance sheet of Jordan's Golf Shop, Inc., showed long-term debt of \$1.625 million, and the 2015 balance sheet showed long-term debt of \$1.73 million. The 2015 income statement showed an interest expense of \$185,000. What was the firm's cash flow to creditors during 2015?
9. **Cash Flow to Stockholders** The 2014 balance sheet of Jordan's Golf Shop, Inc., showed \$510,000 in the common stock account and \$3.6 million in the additional paid-in surplus account. The 2015 balance sheet showed \$545,000 and \$3.85 million in the same two accounts, respectively. If the company paid out \$275,000 in cash dividends during 2015, what was the cash flow to stockholders for the year?
10. **Calculating Cash Flows** Given the information for Jordan's Golf Shop, Inc., in the previous two problems, suppose you also know that the firm's net capital spending for 2015 was \$975,000 and that the firm reduced its net working capital investment by \$132,000. What was the firm's 2015 operating cash flow, or OCF?
11. **Cash Flows** Ritter Corporation's accountants prepared the following financial statements for year-end 2015:
 - a. Explain the change in cash during 2015.
 - b. Determine the change in net working capital in 2015.
 - c. Determine the cash flow generated by the firm's assets during 2015.

INTERMEDIATE
(Questions 11–23)

RITTER CORPORATION
Income Statement
2015

Revenue	\$785
Expenses	575
Depreciation	90
Net income	<u>\$120</u>
Dividends	\$ 95



RITTER CORPORATION		
Balance Sheet		
December 31		
	2015	2014
Assets		
Cash	\$ 80	\$ 60
Other current assets	185	170
Net fixed assets	405	385
Total assets	<u>\$670</u>	<u>\$615</u>
Liabilities and Equity		
Accounts payable	\$140	\$125
Long-term debt	160	150
Stockholders' equity	370	340
Total liabilities and equity	<u>\$670</u>	<u>\$615</u>

12. **Financial Cash Flows** The Stancil Corporation provided the following current information:

Proceeds from long-term borrowing	\$17,800
Proceeds from the sale of common stock	5,000
Purchases of fixed assets	27,000
Purchases of inventories	2,300
Payment of dividends	15,200

Determine the cash flows from the firm and the cash flows to investors of the firm.

13. **Building an Income Statement** During the year, the Senbet Discount Tire Company had gross sales of \$925,000. The firm's cost of goods sold and selling expenses were \$490,000 and \$220,000, respectively. Senbet also had notes payable of \$740,000. These notes carried an interest rate of 4 percent. Depreciation was \$120,000. Senbet's tax rate was 35 percent.
- What was Senbet's net income?
 - What was Senbet's operating cash flow?
14. **Calculating Total Cash Flows** Schwert Corp. shows the following information on its 2015 income statement: sales = \$215,000; costs = \$117,000; other expenses = \$6,700; depreciation expense = \$18,400; interest expense = \$10,000; taxes = \$25,370; dividends = \$9,500. In addition, you're told that the firm issued \$8,100 in new equity during 2015 and redeemed \$7,200 in outstanding long-term debt.
- What is the 2015 operating cash flow?
 - What is the 2015 cash flow to creditors?
 - What is the 2015 cash flow to stockholders?
 - If net fixed assets increased by \$28,400 during the year, what was the addition to net working capital (NWC)?
15. **Using Income Statements** Given the following information for O'Hara Marine Co., calculate the depreciation expense: sales = \$44,000; costs = \$27,500; addition to retained earnings = \$5,200; dividends paid = \$1,670; interest expense = \$1,850; tax rate = 40 percent.
16. **Residual Claims** Josipovich, Inc., is obligated to pay its creditors \$11,300 very soon.
- What is the market value of the shareholders' equity if assets have a market value of \$12,400?
 - What if assets equal \$9,600?

17. **Marginal versus Average Tax Rates** (Refer to Table 2.3.) Corporation Growth has \$82,500 in taxable income, and Corporation Income has \$8,250,000 in taxable income.
- What is the tax bill for each firm?
 - Suppose both firms have identified a new project that will increase taxable income by \$10,000. How much in additional taxes will each firm pay? Why is this amount the same?
18. **Net Income and OCF** During 2015, Rainbow Umbrella Corp. had sales of \$590,000. Cost of goods sold, administrative and selling expenses, and depreciation expenses were \$455,000, \$85,000, and \$125,000, respectively. In addition, the company had an interest expense of \$65,000 and a tax rate of 35 percent. (Ignore any tax loss carryback or carryforward provisions.)
- What is the company's net income for 2015?
 - What is its operating cash flow?
 - Explain your results in (a) and (b).
19. **Accounting Values versus Cash Flows** In Problem 18, suppose Rainbow Umbrella Corp. paid out \$34,000 in cash dividends. Is this possible? If spending on net fixed assets and net working capital was zero, and if no new stock was issued during the year, what was the change in the firm's long-term debt account?
20. **Calculating Cash Flows** Cusic Industries had the following operating results for 2015: sales = \$20,300; cost of goods sold = \$14,500; depreciation expense = \$2,900; interest expense = \$690; dividends paid = \$660. At the beginning of the year, net fixed assets were \$15,470, current assets were \$4,630, and current liabilities were \$2,520. At the end of the year, net fixed assets were \$17,120, current assets were \$5,345, and current liabilities were \$2,785. The tax rate for 2015 was 40 percent.
- What is net income for 2015?
 - What is the operating cash flow for 2015?
 - What is the cash flow from assets for 2015? Is this possible? Explain.
 - If no new debt was issued during the year, what is the cash flow to creditors? What is the cash flow to stockholders? Explain and interpret the positive and negative signs of your answers in (a) through (d).
21. **Calculating Cash Flows** Consider the following abbreviated financial statements for Weston Enterprises:



WESTON ENTERPRISES 2015 and 2014 Partial Balance Sheets					
	Assets		Liabilities and Owners' Equity		
	2015	2014		2015	2014
Current assets	\$1,176	\$ 964	Current liabilities	\$ 445	\$ 401
Net fixed assets	5,104	4,384	Long-term debt	2,713	2,380

WESTON ENTERPRISES 2015 Income Statement	
Sales	\$14,740
Costs	5,932
Depreciation	1,190
Interest paid	328

- What is owners' equity for 2014 and 2015?
- What is the change in net working capital for 2015?
- In 2015, Weston Enterprises purchased \$2,350 in new fixed assets. How much in fixed assets did Weston Enterprises sell? What is the cash flow from assets for the year? (The tax rate is 40 percent.)
- During 2015, Weston Enterprises raised \$455 in new long-term debt. How much long-term debt must Weston Enterprises have paid off during the year? What is the cash flow to creditors?



Use the following information for Ingersoll, Inc., for Problems 22 and 23 (assume the tax rate is 34 percent):

	2014	2015
Sales	\$ 9,402	\$10,091
Depreciation	1,350	1,351
Cost of goods sold	3,235	3,672
Other expenses	767	641
Interest	630	724
Cash	4,931	6,244
Accounts receivable	6,527	7,352
Short-term notes payable	953	895
Long-term debt	16,152	19,260
Net fixed assets	41,346	42,332
Accounts payable	5,179	5,022
Inventory	11,604	11,926
Dividends	1,147	1,261



22. **Financial Statements** Draw up an income statement and balance sheet for this company for 2014 and 2015.
23. **Calculating Cash Flow** For 2015, calculate the cash flow from assets, cash flow to creditors, and cash flow to stockholders.
24. **Cash Flows** You are researching Time Manufacturing and have found the following accounting statement of cash flows for the most recent year. You also know that the company paid \$84 million in current taxes and had an interest expense of \$41 million. Use the accounting statement of cash flows to construct the financial statement of cash flows.

CHALLENGE
(Questions 24–26)

TIME MANUFACTURING Statement of Cash Flows (\$ in millions)	
Operations	
Net income	\$192
Depreciation	76
Deferred taxes	13
Changes in assets and liabilities	
Accounts receivable	–16
Inventories	17
Accounts payable	13
Accrued expenses	–7
Other	2
Total cash flow from operations	<u>\$290</u>
Investing activities	
Acquisition of fixed assets	–\$198
Sale of fixed assets	21
Total cash flow from investing activities	<u>–\$177</u>

Financing activities	
Retirement of long-term debt	-\$150
Proceeds from long-term debt sales	115
Change in notes payable	8
Dividends	-81
Repurchase of stock	-11
Proceeds from new stock issue	43
Total cash flow from financing activities	-\$ 76
Change in cash (on balance sheet)	\$ 37

25. **Net Fixed Assets and Depreciation** On the balance sheet, the net fixed assets (NFA) account is equal to the gross fixed assets (FA) account, which records the acquisition cost of fixed assets, minus the accumulated depreciation (AD) account, which records the total depreciation taken by the firm against its fixed assets. Using the fact that $NFA = FA - AD$, show that the expression given in the chapter for net capital spending, $NFA_{end} - NFA_{beg} + D$ (where D is the depreciation expense during the year), is equivalent to $FA_{end} - FA_{beg}$.
26. **Tax Rates** Refer to the corporate marginal tax rate information in Table 2.3.
- Why do you think the marginal tax rate jumps up from 34 percent to 39 percent at a taxable income of \$100,001, and then falls back to a 34 percent marginal rate at a taxable income of \$335,001?
 - Compute the average tax rate for a corporation with exactly \$335,001 in taxable income. Does this confirm your explanation in part (a)? What is the average tax rate for a corporation with exactly \$18,333,334? Is the same thing happening here?
 - The 39 percent and 38 percent tax rates both represent what is called a tax “bubble.” Suppose the government wanted to lower the upper threshold of the 39 percent marginal tax bracket from \$335,000 to \$200,000. What would the new 39 percent bubble rate have to be?

Excel Master It! Problem



Using Excel to find the marginal tax rate can be accomplished using the VLOOKUP function. However, calculating the total tax bill is a little more difficult. Below we have shown a copy of the IRS tax table for an individual for 2015 (the income thresholds are indexed to inflation and change through time).

If taxable income is over --	But not over --	The tax is:
\$ 0	\$ 9,225	10% of the amount over \$0
9,226	37,450	\$922.50 plus 15% of the amount over \$9,225
37,451	90,750	\$5,126.25 plus 25% of the amount over \$37,450
90,751	189,300	\$18,481.25 plus 28% of the amount over \$90,750
189,301	411,500	\$46,075.25 plus 33% of the amount over \$189,300
411,501	413,200	\$119,402.25 plus 35% of the amount over \$411,500
413,201		\$119,996.25 plus 39.6% of the amount over \$413,200

In reading this table, the marginal tax rate for taxable income less than \$9,225 is 10 percent. If the taxable income is between \$9,226 and \$37,450, the tax bill is \$922.50 plus the marginal taxes. The marginal taxes are calculated as the taxable income minus \$9,225 times the marginal tax rate of 15 percent.



- a. Create a tax table for corporate taxes similar to the individual tax table shown above.
- b. For a given taxable income, what is the marginal tax rate?
- c. For a given taxable income, what is the total tax bill?
- d. For a given taxable income, what is the average tax rate?

Mini Case

CASH FLOWS AT WARF COMPUTERS, INC.

Warf Computers, Inc., was founded 15 years ago by Nick Warf, a computer programmer. The small initial investment to start the company was made by Nick and his friends. Over the years, this same group has supplied the limited additional investment needed by the company in the form of both equity and short- and long-term debt. Recently the company has developed a virtual keyboard (VK). The VK uses sophisticated artificial intelligence algorithms that allow the user to speak naturally and have the computer input the text, correct spelling and grammatical errors, and format the document according to preset user guidelines. The VK even suggests alternative phrasing and sentence structure, and it provides detailed stylistic diagnostics. Based on a proprietary, very advanced software/hardware hybrid technology, the system is a full generation beyond what is currently on the market. To introduce the VK, the company will require significant outside investment.

Nick has made the decision to seek this outside financing in the form of new equity investments and bank loans. Naturally, new investors and the banks will require a detailed financial analysis. Your employer, Angus Jones & Partners, LLC, has asked you to examine the financial statements provided by Nick. Here are the balance sheets for the two most recent years and the most recent income statement:

WARF COMPUTERS					
Balance Sheet					
(\$ in thousands)					
	2015	2014		2015	2014
Current assets			Current liabilities		
Cash and equivalents	\$ 452	\$ 391	Accounts payable	\$ 519	\$ 485
Accounts receivable	716	668	Accrued expenses	247	401
Inventories	641	663	Total current		
Other	92	78	liabilities	\$ 766	\$ 886
Total current assets	<u>\$1,901</u>	<u>\$1,800</u>	Long-term liabilities		
Fixed assets			Deferred taxes	\$ 330	\$ 159
Property, plant, and	\$4,148	\$3,179	Long-term debt	1,179	1,148
equipment			Total long-term		
Less accumulated			liabilities	\$1,509	\$1,307
depreciation	<u>1,340</u>	<u>1,092</u>	Stockholders' equity		
Net property, plant, and	<u>\$2,808</u>	<u>\$2,087</u>	Preferred stock	\$ 21	\$ 21
equipment			Common stock	126	126
Intangible assets and others	<u>793</u>	<u>709</u>	Capital surplus	794	779
Total fixed assets	<u>\$3,601</u>	<u>\$2,796</u>	Accumulated retained	2,478	1,603
			earnings		
			Less treasury stock	192	126
			Total equity	<u>\$3,227</u>	<u>\$2,403</u>
			Total liabilities and		
Total assets	<u>\$5,502</u>	<u>\$4,596</u>	shareholders' equity	<u>\$5,502</u>	<u>\$4,596</u>

Nick has also provided the following information: During the year the company raised \$228,000 in new long-term debt and retired \$197,000 in long-term debt. The company also sold \$15,000 in new stock and repurchased \$66,000 in stock. The company purchased \$1,482,000 in fixed assets and sold \$429,000 in fixed assets.

WARF COMPUTERS	
Income Statement	
(\$ in thousands)	
Sales	\$7,557
Cost of goods sold	4,456
Selling, general, and administrative expense	848
Depreciation	248
Operating income	\$2,005
Other income	75
EBIT	\$2,080
Interest expense	137
Pretax income	\$1,943
Taxes	776
Current: \$605	
Deferred: 171	
Net income	\$1,167
Dividends	\$ 292
Retained earnings	\$ 875

Angus has asked you to prepare the financial statement of cash flows and the accounting statement of cash flows. He has also asked you to answer the following questions:

1. How would you describe Warf Computers' cash flows?
2. Which cash flow statement more accurately describes the cash flows at the company?
3. In light of your previous answers, comment on Nick's expansion plans.

Financial Statements Analysis and Financial Models

The price of a share of common stock in theme park company SeaWorld closed at about \$18 on October 13, 2014. At that price, SeaWorld had a price–earnings (PE) ratio of 17. That is, investors were willing to pay \$17 for every dollar in income earned by SeaWorld. At the same time, investors were willing to pay \$8, \$24, and \$28 for each dollar earned by Ford, Coca-Cola, and Google, respectively. At the other extreme were JCPenney and United States Steel. Both had negative earnings for the previous year, but JCPenney was priced at about \$7 per share and United States Steel at about \$33 per share. Because they had negative earnings,

their PE ratios would have been negative, so they were not reported. At the same time, the typical stock in the S&P 500 Index of large company stocks was trading at a PE of about 17, or about 17 times earnings, as they say on Wall Street.

Price–earnings comparisons are examples of the use of financial ratios. As we will see in this chapter, there are a wide variety of financial ratios, all designed to summarize specific aspects of a firm’s financial position. In addition to discussing how to analyze financial statements and compute financial ratios, we will have quite a bit to say about who uses this information and why.

3.1 Financial Statements Analysis



In Chapter 2, we discussed some of the essential concepts of financial statements and cash flows. This chapter continues where our earlier discussion left off. Our goal here is to expand your understanding of the uses (and abuses) of financial statement information.

A good working knowledge of financial statements is desirable simply because such statements, and numbers derived from those statements, are the primary means of communicating financial information both within the firm and outside the firm. In short, much of the language of business finance is rooted in the ideas we discuss in this chapter.

Clearly, one important goal of the accountant is to report financial information to the user in a form useful for decision making. Ironically, the information frequently does not come to the user in such a form. In other words, financial statements don’t come with a user’s guide. This chapter is a first step in filling this gap.

STANDARDIZING STATEMENTS

One obvious thing we might want to do with a company’s financial statements is to compare them to those of other, similar companies. We would immediately have a problem,

however. It's almost impossible to directly compare the financial statements for two companies because of differences in size.

For example, Tesla and GM are obviously serious rivals in the auto market, but GM is larger, so it is difficult to compare them directly. For that matter, it's difficult even to compare financial statements from different points in time for the same company if the company's size has changed. The size problem is compounded if we try to compare GM and, say, Toyota. If Toyota's financial statements are denominated in yen, then we have size *and* currency differences.

To start making comparisons, one obvious thing we might try to do is to somehow standardize the financial statements. One common and useful way of doing this is to work with percentages instead of total dollars. The resulting financial statements are called **common-size statements**. We consider these next.

COMMON-SIZE BALANCE SHEETS

For easy reference, Prufrock Corporation's 2014 and 2015 balance sheets are provided in Table 3.1. Using these, we construct common-size balance sheets by expressing each item as a percentage of total assets. Prufrock's 2014 and 2015 common-size balance sheets are shown in Table 3.2.

Notice that some of the totals don't check exactly because of rounding errors. Also notice that the total change has to be zero because the beginning and ending numbers must add up to 100 percent.

Table 3.1

PRUFROCK CORPORATION		
Balance Sheets as of December 31, 2014 and 2015		
(\$ in millions)		
Assets	2014	2015
Current assets		
Cash	\$ 84	\$ 98
Accounts receivable	165	188
Inventory	393	422
Total	<u>\$ 642</u>	<u>\$ 708</u>
Fixed assets		
Net plant and equipment	\$2,731	\$2,880
Total assets	<u>\$3,373</u>	<u>\$3,588</u>
Liabilities and Owners' Equity		
Current liabilities		
Accounts payable	\$ 312	\$ 344
Notes payable	231	196
Total	<u>\$ 543</u>	<u>\$ 540</u>
Long-term debt	<u>\$ 531</u>	<u>\$ 457</u>
Owners' equity		
Common stock and paid-in surplus	\$ 500	\$ 550
Retained earnings	1,799	2,041
Total	<u>\$2,299</u>	<u>\$2,591</u>
Total liabilities and owners' equity	<u>\$3,373</u>	<u>\$3,588</u>



Table 3.2

PRUFROCK CORPORATION			
Common-Size Balance Sheets			
December 31, 2014 and 2015			
Assets	2014	2015	Change
Current assets			
Cash	2.5%	2.7%	+ .2%
Accounts receivable	4.9	5.2	+ .3
Inventory	<u>11.7</u>	<u>11.8</u>	<u>+ .1</u>
Total	<u>19.1</u>	<u>19.7</u>	<u>+ .7</u>
Fixed assets			
Net plant and equipment	<u>80.9</u>	<u>80.3</u>	<u>− .7</u>
Total assets	<u>100.0%</u>	<u>100.0%</u>	<u>.0%</u>
Liabilities and Owners' Equity			
Current liabilities			
Accounts payable	9.2%	9.6%	+ .3%
Notes payable	<u>6.8</u>	<u>5.5</u>	<u>− 1.3</u>
Total	<u>16.0</u>	<u>15.1</u>	<u>− 1.0</u>
Long-term debt	<u>15.7</u>	<u>12.7</u>	<u>− 3.0</u>
Owners' equity			
Common stock and paid-in surplus	14.8	15.3	+ .5
Retained earnings	<u>53.3</u>	<u>56.9</u>	<u>+ 3.5</u>
Total	<u>68.1</u>	<u>72.2</u>	<u>+ 4.1</u>
Total liabilities and owners' equity	<u>100.0%</u>	<u>100.0%</u>	<u>.0%</u>

In this form, financial statements are relatively easy to read and compare. For example, just looking at the two balance sheets for Prufrock, we see that current assets were 19.7 percent of total assets in 2015, up from 19.1 percent in 2014. Current liabilities declined from 16.0 percent to 15.1 percent of total liabilities and equity over that same time. Similarly, total equity rose from 68.1 percent of total liabilities and equity to 72.2 percent.

Overall, Prufrock's liquidity, as measured by current assets compared to current liabilities, increased over the year. Simultaneously, Prufrock's indebtedness diminished as a percentage of total assets. We might be tempted to conclude that the balance sheet has grown "stronger."

COMMON-SIZE INCOME STATEMENTS

Table 3.3 describes some commonly used measures of earnings. A useful way of standardizing the income statement shown in Table 3.4 is to express each item as a percentage of total sales, as illustrated for Prufrock in Table 3.5.

This income statement tells us what happens to each dollar in sales. For Prufrock, interest expense eats up \$.061 out of every sales dollar, and taxes take another \$.081. When all is said and done, \$.157 of each dollar flows through to the bottom line (net income), and that amount is split into \$.105 retained in the business and \$.052 paid out in dividends.

These percentages are useful in comparisons. For example, a relevant figure is the cost percentage. For Prufrock, \$.582 of each \$1.00 in sales goes to pay for goods sold. It would be interesting to compute the same percentage for Prufrock's main competitors to see how Prufrock stacks up in terms of cost control.

Table 3.3
Measures of Earnings

Investors and analysts look closely at the income statement for clues on how well a company has performed during a particular year. Here are some commonly used measures of earnings (numbers in millions).

Net income	The so-called bottom line, defined as total revenue minus total expenses. Net income for Prufrock in the latest period is \$363 million. Net income reflects differences in a firm's capital structure and taxes as well as operating income. Interest expense and taxes are subtracted from operating income in computing net income. Shareholders look closely at net income because dividend payout and retained earnings are closely linked to net income.
EPS	Net income divided by the number of shares outstanding. It expresses net income on a per share basis. For Prufrock, the $EPS = (\text{Net income}) / (\text{Shares outstanding}) = \$363 / 33 = \$11$.
EBIT	Earnings before interest expense and taxes. EBIT is usually called "income from operations" on the income statement and is income before unusual items, discontinued operations or extraordinary items. To calculate EBIT, operating expenses are subtracted from total operations revenues. Analysts like EBIT because it abstracts from differences in earnings from a firm's capital structure (interest expense) and taxes. For Prufrock, EBIT is \$691 million.
EBITDA	Earnings before interest expense, taxes, depreciation, and amortization. $EBITDA = EBIT + \text{depreciation and amortization}$. Here amortization refers to a noncash expense similar to depreciation except it applies to an intangible asset (such as a patent), rather than a tangible asset (such as a machine). The word amortization here does not refer to the payment of debt. There is no amortization in Prufrock's income statement. For Prufrock, $EBITDA = \$691 + \$276 = \$967$ million. Analysts like to use EBITDA because it adds back two noncash items (depreciation and amortization) to EBIT and thus is a better measure of before-tax operating cash flow.

Sometimes these measures of earnings are preceded by the letters LTM, meaning the last twelve months. For example, LTM EPS is the last twelve months of EPS and LTM EBITDA is the last twelve months of EBITDA. At other times, the letters TTM are used, meaning trailing twelve months. Needless to say, LTM is the same as TTM.

Table 3.4

PRUFROCK CORPORATION	
2015 Income Statement	
(\$ in millions)	
Sales	\$2,311
Cost of goods sold	1,344
Depreciation	276
Earnings before interest and taxes	\$ 691
Interest paid	141
Taxable income	\$ 550
Taxes (34%)	187
Net income	<u>\$ 363</u>
Dividends	\$ 121
Addition to retained earnings	242



Table 3.5

PRUFROCK CORPORATION	
Common-Size Income Statement 2015	
Sales	100.0%
Cost of goods sold	58.2
Depreciation	11.9
Earnings before interest and taxes	29.9
Interest paid	6.1
Taxable income	23.8
Taxes (34%)	8.1
Net income	15.7%
Dividends	5.2%
Addition to retained earnings	10.5

3.2 Ratio Analysis



Another way of avoiding the problems involved in comparing companies of different sizes is to calculate and compare **financial ratios**. Such ratios are ways of comparing and investigating the relationships between different pieces of financial information. We cover some of the more common ratios next (there are many others we don't discuss here).

One problem with ratios is that different people and different sources frequently don't compute them in exactly the same way, and this leads to much confusion. The specific definitions we use here may or may not be the same as ones you have seen or will see elsewhere. If you are using ratios as tools for analysis, you should be careful to document how you calculate each one; and, if you are comparing your numbers to those of another source, be sure you know how their numbers are computed.

We will defer much of our discussion of how ratios are used and some problems that come up with using them until later in the chapter. For now, for each ratio we discuss, several questions come to mind:

1. How is it computed?
2. What is it intended to measure, and why might we be interested?
3. What is the unit of measurement?
4. What might a high or low value be telling us? How might such values be misleading?
5. How could this measure be improved?

Financial ratios are traditionally grouped into the following categories:

1. Short-term solvency, or liquidity, ratios.
2. Long-term solvency, or financial leverage, ratios.
3. Asset management, or turnover, ratios.
4. Profitability ratios.
5. Market value ratios.

We will consider each of these in turn. In calculating these numbers for Prufrock, we will use the ending balance sheet (2015) figures unless we explicitly say otherwise.

Go to www.reuters.com/finance/stocks and find the financials link to examine comparative ratios for a huge number of companies.

SHORT-TERM SOLVENCY OR LIQUIDITY MEASURES

As the name suggests, short-term solvency ratios as a group are intended to provide information about a firm's liquidity, and these ratios are sometimes called *liquidity measures*. The primary concern is the firm's ability to pay its bills over the short run without undue stress. Consequently, these ratios focus on current assets and current liabilities.

For obvious reasons, liquidity ratios are particularly interesting to short-term creditors. Because financial managers are constantly working with banks and other short-term lenders, an understanding of these ratios is essential.

One advantage of looking at current assets and liabilities is that their book values and market values are likely to be similar. Often (though not always), these assets and liabilities just don't live long enough for the two to get seriously out of step. On the other hand, like any type of near-cash, current assets and liabilities can and do change fairly rapidly, so today's amounts may not be a reliable guide to the future.

Current Ratio One of the best-known and most widely used ratios is the *current ratio*. As you might guess, the current ratio is defined as:

$$\text{Current ratio} = \frac{\text{Current assets}}{\text{Current liabilities}} \quad (3.1)$$

For Prufrock, the 2015 current ratio is:

$$\text{Current ratio} = \frac{\$708}{\$540} = 1.31 \text{ times}$$

Because current assets and liabilities are, in principle, converted to cash over the following 12 months, the current ratio is a measure of short-term liquidity. The unit of measurement is either dollars or times. So, we could say Prufrock has \$1.31 in current assets for every \$1 in current liabilities, or we could say Prufrock has its current liabilities covered 1.31 times over. Absent some extraordinary circumstances, we would expect to see a current ratio of at least 1; a current ratio of less than 1 would mean that net working capital (current assets less current liabilities) is negative.

The current ratio, like any ratio, is affected by various types of transactions. For example, suppose the firm borrows over the long term to raise money. The short-run effect would be an increase in cash from the issue proceeds and an increase in long-term debt. Current liabilities would not be affected, so the current ratio would rise.

EXAMPLE

3.1

Current Events Suppose a firm were to pay off some of its suppliers and short-term creditors. What would happen to the current ratio? Suppose a firm buys some inventory. What happens in this case? What happens if a firm sells some merchandise?

The first case is a trick question. What happens is that the current ratio moves away from 1. If it is greater than 1, it will get bigger, but if it is less than 1, it will get smaller. To see this, suppose the firm has \$4 in current assets and \$2 in current liabilities for a current ratio of 2. If we use \$1 in cash to reduce current liabilities, the new current ratio is $(\$4 - 1)/(\$2 - 1) = 3$. If we reverse the original situation to \$2 in current assets and \$4 in current liabilities, the change will cause the current ratio to fall to $1/3$ from $1/2$.

The second case is not quite as tricky. Nothing happens to the current ratio because cash goes down while inventory goes up—total current assets are unaffected.

In the third case, the current ratio would usually rise because inventory is normally shown at cost and the sale would normally be at something greater than cost (the difference is the markup). The increase in either cash or receivables is therefore greater than the decrease in inventory. This increases current assets, and the current ratio rises.



Finally, note that an apparently low current ratio may not be a bad sign for a company with a large reserve of untapped borrowing power.

Quick (or Acid-Test) Ratio Inventory is often the least liquid current asset. It's also the one for which the book values are least reliable as measures of market value because the quality of the inventory isn't considered. Some of the inventory may later turn out to be damaged, obsolete, or lost.

More to the point, relatively large inventories are often a sign of short-term trouble. The firm may have overestimated sales and overbought or overproduced as a result. In this case, the firm may have a substantial portion of its liquidity tied up in slow-moving inventory.

To further evaluate liquidity, the *quick*, or *acid-test*, *ratio* is computed just like the current ratio, except inventory is omitted:

$$\text{Quick ratio} = \frac{\text{Current assets} - \text{Inventory}}{\text{Current liabilities}} \quad (3.2)$$

Notice that using cash to buy inventory does not affect the current ratio, but it reduces the quick ratio. Again, the idea is that inventory is relatively illiquid compared to cash.

For Prufrock, this ratio in 2015 was:

$$\text{Quick ratio} = \frac{\$708 - 422}{\$540} = .53 \text{ times}$$

The quick ratio here tells a somewhat different story than the current ratio because inventory accounts for more than half of Prufrock's current assets. To exaggerate the point, if this inventory consisted of, say, unsold nuclear power plants, then this would be a cause for concern.

To give an example of current versus quick ratios, based on recent financial statements, Walmart and ManpowerGroup, had current ratios of .88 and 1.50, respectively. However, ManpowerGroup carries no inventory to speak of, whereas Walmart's current assets are virtually all inventory. As a result, Walmart's quick ratio was only .24, and ManpowerGroup's was 1.50, the same as its current ratio.

Cash Ratio A very short-term creditor might be interested in the *cash ratio*:

$$\text{Cash ratio} = \frac{\text{Cash}}{\text{Current liabilities}} \quad (3.3)$$

You can verify that this works out to be .18 times for Prufrock.

LONG-TERM SOLVENCY MEASURES

Long-term solvency ratios are intended to address the firm's long-run ability to meet its obligations or, more generally, its financial leverage. These ratios are sometimes called *financial leverage ratios* or just *leverage ratios*. We consider three commonly used measures and some variations.

Total Debt Ratio The *total debt ratio* takes into account all debts of all maturities to all creditors. It can be defined in several ways, the easiest of which is this:

$$\begin{aligned} \text{Total debt ratio} &= \frac{\text{Total assets} - \text{Total equity}}{\text{Total assets}} \quad (3.4) \\ &= \frac{\$3,588 - 2,591}{\$3,588} = .28 \text{ times} \end{aligned}$$

In this case, an analyst might say that Prufrock uses 28 percent debt.¹ Whether this is high or low or whether it even makes any difference depends on whether capital structure matters, a subject we discuss in a later chapter.

Prufrock has \$.28 in debt for every \$1 in assets. Therefore, there is \$.72 in equity (= \$1 - .28) for every \$.28 in debt. With this in mind, we can define two useful variations on the total debt ratio, the *debt–equity ratio* and the *equity multiplier*:

The online U.S. Small Business Administration has more information about financial statements, ratios, and small business topics at www.sba.gov.

$$\begin{aligned} \text{Debt–equity ratio} &= \text{Total debt/Total equity} && (3.5) \\ &= \$.28/\$.72 = .39 \text{ times} \end{aligned}$$

$$\begin{aligned} \text{Equity multiplier} &= \text{Total assets/Total equity} && (3.6) \\ &= \$1/\$.72 = 1.39 \text{ times} \end{aligned}$$

The fact that the equity multiplier is 1 plus the debt–equity ratio is not a coincidence:

$$\begin{aligned} \text{Equity multiplier} &= \text{Total assets/Total equity} = \$1/\$.72 = 1.39 \text{ times} \\ &= (\text{Total equity} + \text{Total debt})/\text{Total equity} \\ &= 1 + \text{Debt–equity ratio} = 1.39 \text{ times} \end{aligned}$$

The thing to notice here is that given any one of these three ratios, you can immediately calculate the other two, so they all say exactly the same thing.

Times Interest Earned Another common measure of long-term solvency is the *times interest earned (TIE) ratio*. Once again, there are several possible (and common) definitions, but we'll stick with the most traditional:

$$\begin{aligned} \text{Times interest earned ratio} &= \frac{\text{EBIT}}{\text{Interest}} && (3.7) \\ &= \frac{\$691}{\$141} = 4.9 \text{ times} \end{aligned}$$

As the name suggests, this ratio measures how well a company has its interest obligations covered, and it is often called the *interest coverage ratio*. For Prufrock, the interest bill is covered 4.9 times over.

Cash Coverage A problem with the TIE ratio is that it is based on EBIT, which is not really a measure of cash available to pay interest. The reason is that depreciation and amortization, noncash expenses, have been deducted out. Because interest is most definitely a cash outflow (to creditors), one way to define the *cash coverage ratio* is:

$$\begin{aligned} \text{Cash coverage ratio} &= \frac{\text{EBIT} + (\text{Depreciation and amortization})}{\text{Interest}} && (3.8) \\ &= \frac{\$691 + 276}{\$141} = \frac{\$967}{\$141} = 6.9 \text{ times} \end{aligned}$$

The numerator here, EBIT plus depreciation and amortization, is often abbreviated EBITDA (earnings before interest, taxes, depreciation, and amortization). It is a basic measure of the firm's ability to generate cash from operations, and it is frequently used as a measure of cash flow available to meet financial obligations.

¹Total equity here includes preferred stock, if there is any. An equivalent numerator in this ratio would be (Current liabilities + Long-term debt).