FOURTH EDITION

Ross
Westerfield
Jaffe
Jordan

CORPORATE FINANCE

CORE PRINCIPLES & APPLICATIONS

corporate finance
CORE PRINCIPLES & APPLICATIONS

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

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FOURTH EDITION

corporate finance

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CORPORATE FINANCE: CORE PRINCIPLES & APPLICATIONS, FOURTH EDITION

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This book is printed on acid-free paper.

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

ISBN 978-0-07-786165-0
MHID 0-07-786165-5

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Senior Buyer: *Carol A. Bielski*
Senior Designer: *Matt Diamond*
Cover Image: *Copyright ©Getty Images*
Typeface: *10/12 Times Roman*
Compositor: *MPS Limited*
Printer: *R. R. Donnelley*

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Library of Congress Cataloging-in-Publication Data

Ross, Stephen A.
Corporate finance : core principles & applications / Stephen A. Ross, Sloan School of Management, Massachusetts Institute of Technology, Randolph W. Westerfield, Marshall School of Business, University of Southern California, Jeffrey F. Jaffe, Wharton School of Business, University of Pennsylvania, Bradford D. Jordan, Gatton College of Business and Economics, University of Kentucky. — FOURTH EDITION.
pages cm. — (The McGraw-Hill education series in finance, insurance, and real estate)
Includes index.
ISBN 978-0-07-786165-0 (alk. paper) — ISBN 0-07-786165-5 (alk. paper)
1. Corporations--Finance. I. Title.
HG4026.R6755 2014
658.15--dc23

2013024263

The Internet addresses listed in the text were accurate at the time of publication. The inclusion of a website does not indicate an endorsement by the authors or McGraw-Hill Education, and McGraw-Hill Education does not guarantee the accuracy of the information presented at these sites.

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To our family and friends with love
and gratitude.

—S.A.R. R.W.W. J.F.J. B.D.J.

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FROM THE AUTHORS

IN THE BEGINNING…

It was probably inevitable that the four of us would collaborate on this project. Over the last 20 or so years, we have been working as two separate "RWJ" teams. In that time, we managed (much to our own amazement) to coauthor two widely adopted undergraduate texts and an equally successful graduate text, all in the corporate finance area. These three books have collectively totaled more than 25 editions (and counting), plus a variety of country-specific editions and international editions, and they have been translated into at least a dozen foreign languages.

Even so, we knew that there was a hole in our lineup at the graduate (MBA) level. We've continued to see a need for a concise, up-to-date, and to-the-point product, the majority of which can be realistically covered in a typical single term or course. As we began to develop this book, we realized (with wry chuckles all around) that, between the four of us, we have been teaching and researching finance principles for well over a century. From our own very extensive experience with this material, we recognized that corporate finance introductory classes often have students with extremely diverse educational and professional backgrounds. We also recognized that this course is increasingly being delivered in alternative formats ranging from traditional semester-long classes to highly compressed modules, to purely online courses, taught both synchronously and asynchronously.

OUR APPROACH

To achieve our objective of reaching out to the many different types of students and the varying course environments, we worked to distill the subject of corporate finance down to its core, while maintaining a decidedly modern approach. We have always maintained that corporate finance can be viewed as the working of a few very powerful intuitions. We also know that understanding the "why" is just as important, if not more so, than understanding the "how." Throughout the development of this book, we continued to take a hard look at what is truly relevant and useful. In doing so, we have worked to downplay purely theoretical issues and minimize the use of extensive and elaborate calculations to illustrate points that are either intuitively obvious or of limited practical use.

Perhaps more than anything, this book gave us the chance to pool all that we have learned about what really works in a corporate finance text. We have received an enormous amount of feedback over the years. Based on that feedback, the two key ingredients that we worked to blend together here are the careful attention to pedagogy and readability that we have developed in our undergraduate books and the strong emphasis on current thinking and research that we have always stressed in our graduate book.

From the start, we knew we didn't want this text to be encyclopedic. Our goal instead was to focus on what students really need to carry away from a principles course. After much debate and consultation with colleagues who regularly teach this material, we settled on a total of 20 chapters. Chapter length is typically 30 pages, so most of the book (and, thus, most of the key concepts and applications) can be realistically covered in a single term or module. Writing a book that strictly focuses on core concepts and applications necessarily involves some picking and choosing with regard to both topics and depth of coverage. Throughout, we strike a balance by introducing and covering the essentials, while leaving more specialized topics to follow-up courses.

As in our other books, we treat net present value (NPV) as the underlying and unifying concept in corporate finance. Many texts stop well short of consistently integrating this basic principle. The simple, intuitive, and very powerful notion that NPV represents the excess of market value over cost often is lost in an overly mechanical approach that emphasizes computation at the expense of comprehension. In contrast, every subject we cover is firmly rooted in valuation, and care is taken throughout to explain how particular decisions have valuation effects.

Also, students shouldn't lose sight of the fact that financial management is about management. We emphasize the role of the financial manager as decision maker, and we stress the need for managerial input and judgment. We consciously avoid "black box" approaches to decisions, and where appropriate, the approximate, pragmatic nature of financial analysis is made explicit, possible pitfalls are described, and limitations are discussed.

NEW TO THE FOURTH EDITION

All chapter openers and examples have been updated to reflect the financial trends and turbulence of the last several years. In addition, we have updated the end-of-chapter problems in every chapter. We have tried to incorporate the many exciting new research findings in corporate finance. Several chapters have been extensively rewritten.

- Chapter 6 Stock Valuation. This chapter now adds a description of how discounted cash flow can be used to determine the value of an entire enterprise in addition to individual common stocks. We also introduce the important concept of comparable firms and show how to use market data on comparable firms to bolster discounted cash flow methods. We update the extensive changes taking place in the trading of common stocks. We try to organize the material so that instructors can choose which best fits their lesson plan.

- Chapter 10 Risk and Return Lessons from Market History. We continue to update and internationalize our discussion of historical risk and return because these updates are far from routine. One of our focal points is the equity risk premium (ERP). With better historical data and more countries included, our estimates of the ERP are on stronger footing.
- Chapter 12 has been retitled, from "Risk, Cost of Capital, and Capital Budgeting" to "Risk, Cost of Capital, and Valuation." We introduce the concept of the weighted average cost of capital (R_{WACC}) and show how it can be used along with discounted cash flow to value both an entire enterprise as well as individual projects.
- Chapter 15 Capital Structure: Limits to the Use of Debt. This chapter has been rewritten to incorporate some new and important empirical and theoretical work on capital structure. It is now much clearer to us that actual capital structures vary a lot over time and are much less stable than previously thought. This instability is strongly correlated to investment needs and opportunities and also suggests a greater need for financial flexibility than was previously thought to be necessary. We incorporate some recent research on international leverage ratios. Among 39 different countries, the U.S. has the fourth lowest.
- Chapter 16 Dividends and Other Payouts. We introduce the financial life cycle notion that most high-growth firms with external financial needs don't pay dividends or buy back shares, and low-growth firms with excess cash flows do pay dividends and/or buy back shares. This simple fact sometimes is lost in determining why firms actually pay or do not pay dividends and buy back shares. We use new data incorporating the financial crisis, and also new data covering what happens when corporate earnings turn negative. Interestingly, in our study, the level of dividends did not change much, but share repurchases fell off.
- Chapter 19 Raising Capital. We build on the financial life cycle idea, introducing private equity and venture capital as early ways to raise funds in a firm's life cycle. Later on, successful firms will do an initial public offering (IPO) and seasoned equity offers (SEOs).

Our attention to updating and improving also extended to the extensive collection of support and enrichment materials that accompany the text. Working with many dedicated and talented colleagues and professionals, we continue to provide supplements that are unrivaled at the graduate level (a complete description appears in the following pages). Whether you use just the textbook, or the book in conjunction with other products, we believe you will be able to find a combination that meets your current as well as your changing needs.

—Stephen A. Ross

—Randolph W. Westerfield

—Jeffrey F. Jaffe

—Bradford D. Jordan

PEDAGOGY

Corporate Finance: Core Principles & Applications is rich in valuable learning tools and support to help students succeed in learning the fundamentals of financial management.

Chapter Opening Case

Each chapter begins with a recent real-world event to introduce students to chapter concepts.

8

Making Capital Investment Decisions

OPENING CASE

Everyone knows that computer chips evolve quickly, getting smaller, faster, and cheaper. In fact, the famous Moore's Law (named after Intel cofounder Gordon Moore) predicts that the number of transistors placed on a chip will double every two years (and this prediction has held up very well since it was published in 1965). This growth often means that companies need to build new fabrication facilities. For example, in 2012, Intel announced that it was going to spend about $500 million to upgrade its manufacturing plant in Leixlip, Ireland. The upgrade at the plant would allow the company to produce its new 14 nanometer (nm) chips. The 14 nm chips are smaller, faster, and consume less energy than chips currently in use. Construction on a new 14 nm plant in Arizona had begun just months earlier at a cost of $5 billion. Not to be outdone, GlobalFoundries announced that it was spending $2.3 billion to expand production at its recently completed $4.6 billion plant in upstate New York.

This chapter follows up on our previous one by delving more deeply into capital budgeting and the evaluation of projects such as these chip manufacturing facilities. We identify the relevant cash flows of a project, including initial investment outlays, requirements for net working capital, and operating cash flows. Further, we look at the effects of depreciation and taxes. We also examine the impact of inflation, and show how to evaluate consistently the NPV analysis of a project.

Core Calculator Skills

This icon, located in the margins of the text near key concepts and equations, indicates that additional coverage is available describing how to use a financial calculator when studying the topic. This additional coverage can be found in a special calculator section, Appendix C.

[4.1]

See the calculator appendix on page 659.

Explanatory Web Links

These web links are provided in the margins of the text. They are specifically selected to accompany text material and provide students and instructors with a quick way to check for additional information using the Internet.

= $20 × 5.7590

= $115.18

Online bond calculators are available at personal.fidelity.com; interest rate information is available at money.cnn.com/data/bonds and www.bankrate.com.

This is just the amount of the discount.

What would the Xanth bond sell for if interest rates had dropped by 2 percent instead of rising by 2 percent? As you might guess, the bond would sell for more than $1,000. Such a bond is said to sell at a *premium* and is called a *premium bond*.

This case is just the opposite of that of a discount bond. The Xanth bond now has a coupon rate of 8 percent when the market rate is only 6 percent. Investors are willing to pay a premium to get this extra coupon amount. In this case, the relevant discount rate is 6 percent, and there are nine years remaining. The present value of the $1,000 face amount is:

$$\textbf{Present value of face amount} = \$1{,}000/1.06^9 = \$1{,}000/1.6895 = \$591.89$$

Examples

Separate numbered and titled examples are extensively integrated into the chapters. These examples provide detailed applications and illustrations of the text material in a step-by-step format. Each example is completely self-contained, so students don't have to search for additional information.

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	700	1,000	Shareholders' equity	600	1,100
	$1,100	$1,600		$1,100	$1,600

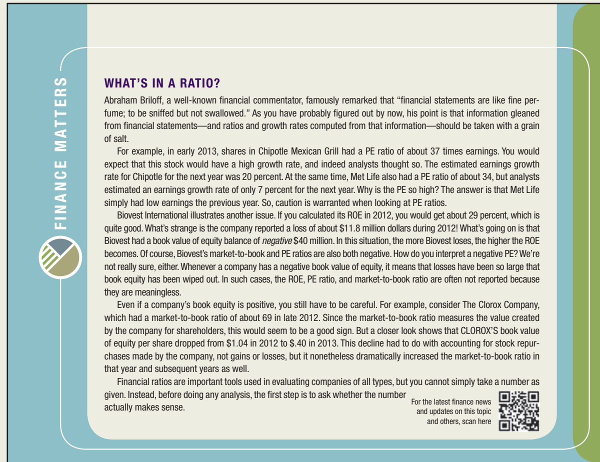
Figures and Tables

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

TABLE 3.10

ROSENGARTEN CORPORATION
Balance Sheet

Assets	$	PERCENTAGE OF SALES	Liabilities and Owners' Equity	$	PERCENTAGE OF SALES
Current assets			Current liabilities		
Cash	$ 160	16%	Accounts payable	$ 300	30%
Accounts receivable	440	44	Notes payable	100	n/a
Inventory	600	60	Total	$ 400	n/a
Total	$1,200	120	Long-term debt	$ 800	n/a
Fixed assets			Owners' equity		
Net plant and equipment	$1,800	180	Common stock and paid-in surplus	$ 800	n/a
			Retained earnings	1,000	n/a



FINANCE MATTERS

WHAT'S IN A RATIO?

Abraham Briloff, a well-known financial commentator, famously remarked that "financial statements are like fine perfume; to be sniffed but not swallowed." As you have probably figured out by now, his point is that information gleaned from financial statements—and ratios and growth rates computed from that information—should be taken with a grain of salt.

For example, in early 2013, shares in Chipotle Mexican Grill had a PE ratio of about 37 times earnings. You would expect that this stock would have a high growth rate, and indeed analysts thought so. The estimated earnings growth rate for Chipotle for the next year was 20 percent. At the same time, Met Life also had a PE ratio of about 34, but analysts estimated an earnings growth rate of only 7 percent for the next year. Why is the PE so high? The answer is that Met Life simply had low earnings the previous year. So, caution is warranted when looking at PE ratios.

Biovest International illustrates another issue. If you calculated its ROE in 2012, you would get about 29 percent, which is quite good. What's strange is the company reported a loss of about $11.8 million dollars during 2012! What's going on is that Biovest had a book value of equity balance of *negative* $40 million. In this situation, the more Biovest loses, the higher the ROE becomes. Of course, Biovest's market-to-book and PE ratios are also both negative. How do you interpret a negative PE? We're not really sure, either. Whenever a company has a negative book value of equity, it means that losses have been so large that book equity has been wiped out. In such cases, the ROE, PE ratio, and market-to-book ratio are often not reported because they are meaningless.

Even if a company's book equity is positive, you still have to be careful. For example, consider The Clorox Company, which had a market-to-book ratio of about 69 in late 2012. Since the market-to-book ratio measures the value created by the company for shareholders, this would seem to be a good sign. But a closer look shows that CLOROX'S book value of equity per share dropped from $1.04 in 2012 to $.40 in 2013. This decline had to do with accounting for stock repurchases made by the company, not gains or losses, but it nonetheless dramatically increased the market-to-book ratio in that year and subsequent years as well.

Financial ratios are important tools used in evaluating companies of all types, but you cannot simply take a number as given. Instead, before doing any analysis, the first step is to ask whether the number actually makes sense.

For the latest finance news and updates on this topic and others, scan here

Finance Matters

By exploring information found in recent publications and building upon concepts learned in each chapter, these boxes work through real-world issues relevant to the surrounding text. QR codes, linking to a blog written by the authors and guest experts, take you to the latest news and analysis regarding related current events.

Spreadsheet Techniques

This feature helps students to improve their Excel spreadsheet skills, particularly as they relate to corporate finance. This feature appears in self-contained sections and shows students how to set up spreadsheets to analyze common financial problems—a vital part of every business student's education. For even more help using Excel, students have access to Excel Master, an in-depth online tutorial.

Calculating NPVs with a Spreadsheet | **SPREADSHEET TECHNIQUES**

Spreadsheets are commonly used to calculate NPVs. Examining the use of spreadsheets in this context also allows us to issue an important warning. Consider the following:

	A	B	C	D	E	F	G	H
1								
2	**Using a spreadsheet to calculate net present values**							
3								
4	A project's cost is $10,000. The cash flows are $2,000 per year for the first two years,							
5	$4,000 per year for the next two, and $5,000 in the last year. The discount rate is							
6	10 percent; what's the NPV?							
7								
8		Year	Cash flow					
9		0	-$10,000	Discount rate =		10%		
10		1	2,000					
11		2	2,000		**NPV =**	**$2,102.72**	(*wrong* answer)	
12		3	4,000		**NPV =**	**$2,312.99**	(*right* answer)	
13		4	4,000					
14		5	5,000					
15								
16	The formula entered in cell F11 is =NPV(F9, C9:C14). However, this gives the wrong answer because the							
17	NPV function actually calculates present values, not *net* present values.							
18								
19	The formula entered in cell F12 is =NPV(F9, C10:C14) + C9. This gives the right answer because the							
20	NPV function is used to calculate the present value of the cash flows and then the initial cost is							
21	subtracted to calculate the answer. Notice that we added cell C9 because it is already negative.							

In our spreadsheet example, notice that we have provided two answers. The first answer is wrong even though we used the spreadsheet's NPV formula. What happened is that the "NPV" function in our spreadsheet is actually a PV function; unfortunately, one of the original spreadsheet programs many years ago got the definition wrong, and subsequent spreadsheets have copied it! Our second answer shows how to use the formula properly.

The example here illustrates the danger of blindly using calculators or computers without understanding what is going on; we shudder to think of how many capital budgeting decisions in the real world are based

DETERMINING THE AMOUNT OF BORROWING How did we know how much to borrow? Buying one-half a share of stock brings us either $30 or $20 at expiration, which is exactly $20 more than the payoffs of $10 and $0, respectively, from the call. To duplicate the call through a purchase of stock, we should also borrow enough money so that we have to pay back exactly $20 of interest and principal. This amount of borrowing is merely the present value of $20, which is $18.18 (= $20/1.10).

Now that we know how to determine both the delta and the amount of borrowing, we can write the value of the call as:

$$\text{Value of call} = \text{Stock price} \times \text{Delta} - \text{Amount borrowed} \qquad [17.2]$$
$$\$6.82 = \$50 \times \tfrac{1}{2} - \$18.18$$

We will find this intuition very useful in explaining the Black-Scholes model.

RISK-NEUTRAL VALUATION Before leaving this simple example, we should comment

Numbered Equations

Key equations are numbered within the text and listed on the back end sheets for easy reference.

END-OF-CHAPTER MATERIAL

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

Summary and Conclusions

Each chapter ends with a numbered and concise, but thorough, summary of the important ideas presented in the chapter—helping students review the key points and providing closure.

SUMMARY AND CONCLUSIONS

1. We began our discussion of the capital structure decision by arguing that the particular capital structure that maximizes the value of the firm is also the one that provides the most benefit to the stockholders.
2. In a world of no taxes, the famous Proposition I of Modigliani and Miller proves that the value of the firm is unaffected by the debt-to-equity ratio. In other words, a firm's capital structure is a matter of indifference in that world. The authors obtain their results by showing that either a high or a low corporate ratio of debt to equity can be offset by homemade leverage. The result hinges on the assumption that individuals can borrow at the same rate as corporations, an assumption we believe to be quite plausible.
3. MM's Proposition II in a world without taxes states that:

$$R_S = R_0 + \frac{B}{S}(R_0 - R_B)$$

This implies that the expected rate of return on equity (also called the *cost of equity* or the *required return on equity*) is positively related to the firm's leverage. This makes intuitive sense because the risk of equity rises with leverage, a point illustrated by Figure 14.2.

4. While the above work of MM is quite elegant, it does not explain the empirical findings on capital structure very well. MM imply that the capital structure decision is a matter of indifference, while the decision appears to be a weighty one in the real world. To achieve real-world applicability, we next

Concept Questions

This end-of-chapter section facilitates your students' knowledge of key principles, as well as their intuitive understanding of the chapter concepts. The questions reinforce students' critical-thinking skills and provide a review of chapter material.

CONCEPT QUESTIONS

1. **Forecasting Risk** What is forecasting risk? In general, would the degree of forecasting risk be greater for a new product or a cost-cutting proposal? Why?
2. **Sensitivity Analysis and Scenario Analysis** What is the essential difference between sensitivity analysis and scenario analysis?
3. **Marginal Cash Flows** A co-worker claims that looking at all this marginal this and incremental that is just a bunch of nonsense, and states: "Listen, if our average revenue doesn't exceed our average cost, then we will have a negative cash flow, and we will go broke!" How do you respond?
4. **Break-Even Point** As a shareholder of a firm that is contemplating a new project, would you be more concerned with the accounting break-even point, the cash break-even point (i.e., the point at which operating cash flow is zero), or the financial break-even point? Why?
5. **Break-Even Point** Assume a firm is considering a new project that requires an initial investment and has equal sales and costs over its life. Will the project reach the accounting, cash, or financial break-even point first? Which will it reach next? Last? Will this ordering always apply?
6. **Real Options** Why does traditional NPV analysis tend to underestimate the true value of a capital budgeting project?
7. **Real Options** The Mango Republic has just liberalized its markets and is now permitting foreign investors. Tesla Manufacturing has analyzed starting a project in the country and has determined that the project has a negative NPV. Why might the company go ahead with the project? What type of option is most likely to add value to this project?

Questions and Problems

Because solving problems is so critical to students' learning, we provide extensive end-of-chapter questions and problems. The questions and problems are segregated into three learning levels: Basic, Intermediate, and Challenge. All problems are fully annotated so that students and instructors can readily identify particular types. Also, most of the problems are available in McGraw-Hill's *Connect*—see the next section of this preface for more details.

QUESTIONS AND PROBLEMS

Basic (Questions 1–13)

1. **Stock Values** The Starr Co. just paid a dividend of $2.35 per share on its stock. The dividends are expected to grow at a constant rate of 4 percent per year indefinitely. If investors require an 11 percent return on the stock, what is the current price? What will the price be in three years? In 15 years?
2. **Stock Values** The next dividend payment by ZYX, Inc., will be $1.99 per share. The dividends are anticipated to maintain a growth rate of 4.5 percent forever. If ZYX stock currently sells for $31 per share, what is the required return?
3. **Stock Values** For the company in the previous problem, what is the dividend yield? What is the expected capital gains yield?
4. **Stock Values** Mickelson Corporation will pay a $2.65 per share dividend next year. The company pledges to increase its dividend by 4.75 percent per year indefinitely. If you require a return of 11 percent on your investment, how much will you pay for the company's stock today?
5. **Stock Valuation** Shelter, Inc., is expected to maintain a constant 4.7 percent growth rate in its dividend indefinitely. If the company has a dividend yield of 5.2 percent, what is the required return on the company's stock?
6. **Stock Valuation** Suppose you know that a company's stock currently sells for $68 per share and the required return on the stock is 12 percent. You also know that the total return on the stock is evenly divided between a capital gains yield and a dividend yield. If it's the company's policy to always maintain a constant growth rate in its dividends, what is the current dividend per share?
7. **Stock Valuation** Gruber Corp. pays a constant $11 dividend on its stock. The company will maintain this dividend for the next eight years and will then cease paying dividends forever. If the required return

WHAT'S ON THE WEB?

1. **Expected Return** You want to find the expected return for Honeywell using the CAPM. First you the market risk premium. Go to money.cnn.com and find the current interest rate for three-month Treasury bills. Use the historic market risk premium from Chapter 10 as the market risk premium. go to finance.yahoo.com, enter the ticker symbol HON for Honeywell, and find the beta for Honeyw What is the expected return for Honeywell using CAPM? What assumptions have you made to arriv this number?

What's On the Web?

These end-of-chapter activities show students how to use and learn from the vast amount of financial resources available on the Internet.

Excel Problems

Indicated by the Excel icon in the margin, these problems are integrated in the Questions and Problems section of almost all chapters. Located on the book's website, Excel templates have been created for each of these problems. Students can use the data in the problem to work out the solution using Excel skills.

15. **Capital Budgeting** You are evaluating a proposed expansion of an existing subsidiary located in Switzerland. The cost of the expansion would be Fr 21 million. The cash flows from the project would be Fr 6.1 million per year for the next five years. The dollar required return is 12 percent per year, and the current exchange rate is Fr .94. The going rate on Eurodollars is 5 percent per year. It is 6 percent per year on Swiss francs.
    a. What do you project will happen to exchange rates over the next four years?
    b. Based on your answer in (a), convert the projected franc flows into dollar flows and calculate the NPV.
    c. What is the required return on franc flows? Based on your answer, calculate the NPV in francs and then convert to dollars.
16. **Translation Exposure** Herbert International has operations in Arrakis. The balance sheet for this division in Arrakeen solaris shows assets of 27,000 solaris, debt in the amount of 9,000 solaris, and equity of 18,000 solaris.
    a. If the current exchange ratio is 1.20 solaris per dollar, what does the balance sheet look like in dollars?

EXCEL MASTER IT! PROBLEM

You want to calculate the WACC for auto parts re struct a spreadsheet that can be updated.

a. Using an input for the ticker symbol, create the information necessary to calculate the c using CAPM.

b. Create hyperlinks to go to the FINRA bond q information for the company's bonds. Create

Excel Master-It! Problems

These more in-depth mini-case studies highlight higher-level Excel skills. Students are encouraged to use Excel to solve real-life financial problems using the concepts they have learned in the chapter and the Excel skills they have acquired thus far.

End-of-Chapter Cases

Located at the end of each 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.

CLOSING CASE

McKENZIE CORPORATION'S CAPITAL BUDGETING

Sam McKenzie is the founder and CEO of McKenzie Restaurants, Inc., a regional company. Sam is considering opening several new restaurants. Sally Thornton, the company's CFO, has been put in charge of the capital budgeting analysis. She has examined the potential for the company's expansion and determined that the success of the new restaurants will depend critically on the state of the economy next year and over the next few years.

McKenzie currently has a bond issue outstanding with a face value of $11.2 million that is due in one year. Covenants associated with this bond issue prohibit the issuance of any additional debt. This restriction means that the expansion will be entirely financed with equity at a cost of $3.6 million. Sally has summarized her analysis in the following table, which shows the value of the company in each state of the economy next year, both with and without expansion.

ECONOMIC GROWTH	PROBABILITY	WITHOUT EXPANSION	WITH EXPANSION
Low	.30	$ 8,800,000	$10,400,000

COMPREHENSIVE TEACHING

DIGITAL SOLUTIONS

Online Learning Center (OLC): Online Support at www.mhhe.com/rwj

The Online Learning Center (OLC) contains FREE access to web-based study and teaching aids created for this text, all in one place!

INSTRUCTOR SUPPORT

- **Instructor's Manual**
  prepared by Bruce Costa, University of Montana, and Joseph Smolira, Belmont University
  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. Detailed solutions for all end-of-chapter problems appear in section three.
- **Test Bank**
  prepared by Bruce Costa, University of Montana
  Great format for a better testing process. The Test Bank has 75–100 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.
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- **PowerPoint Presentation System**
  prepared by Bruce Costa, University of Montana
  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. This customizable format gives you the ability to edit, print, or rearrange the complete presentation to meet your specific needs.

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Online Videos

Available in DVD format and online. Current set of videos on hot topics! McGraw-Hill Education has produced a series of finance videos that are 10-minute case studies on topics such as financial markets, careers, rightsizing, capital budgeting, EVA (economic value added), mergers and acquisitions, and foreign exchange. Discussion questions for these videos, as well as video clips, are available in the Instructor's Center at www.mhhe.com/rwj.

STUDENT SUPPORT

- **Narrated PowerPoint Examples**
  These in-depth slides are designed exclusively for students as part of the premium content package of this book. 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 Master**
  Created by Brad Jordan and Joe Smolira, this extensive Excel tutorial is fully integrated with the text. Learn Excel and corporate finance at the same time.
- **And More!**
  Be sure to check out the other helpful features found on the OLC, including self-grading quizzes and end-of-chapter problem Excel templates.

PACKAGE OPTIONS AVAILABLE FOR PURCHASE & PACKAGING

You may also package either version of the text with a variety of additional learning tools that are available for your students.

Solutions Manual

(ISBN 10: 0077650417 /ISBN 13: 9780077650414)
Prepared by Joseph Smolira, Belmont University, this manual contains detailed, worked-out solutions for all of the problems in the end-of-chapter material. It has also been reviewed for accuracy by multiple sources. The Solutions Manual is also available for purchase for your students.

FinGame Online 5.0

by LeRoy Brooks, John Carroll University
(ISBN 10: 0077219880/ISBN 13: 9780077219888)
Just $15.00 when packaged with this text. In this comprehensive simulation game, students control a hypothetical company over numerous periods of operation. The game is now tied to the text by exercises found on the Online Learning Center. As students make

major financial and operating decisions for their company, they will develop and enhance their skills in financial management and financial accounting statement analysis.

Financial Analysis with an Electronic Calculator, Sixth Edition

by Mark A. White, University of Virginia, McIntire School of Commerce
(ISBN 10: 0073217093/ISBN 13: 9780073217093)
The information and procedures in this supplementary text enable students to master the use of financial calculators and develop a working knowledge of financial mathematics and problem solving. Complete instructions are included for solving all major problem types on three popular models: HP 10B and 12C, TI BA II Plus, and TI-84. Hands-on problems with detailed solutions allow students to practice the skills outlined in the text and obtain instant reinforcement. *Financial Analysis with an Electronic Calculator* is a self-contained supplement to the introductory financial management course.

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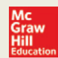

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ACKNOWLEDGMENTS

To borrow a phrase, writing a finance textbook is easy—all you do is sit down at a word processor and open a vein. We never would have completed this book without the incredible amount of help and support we received from our colleagues, students, editors, family members, and friends. We would like to thank, without implicating, all of you.

Clearly, our greatest debt is to our many colleagues (and their students). Needless to say, without this support and feedback we would not be publishing this text.

To the following reviewers we are grateful for their many contributions:

Dean Baim, *Pepperdine University*
Madhulina Bandyopadhyay, *University of Wisconsin, Milwaukee*
Peter Basciano, *Augusta State University*
Elizabeth Booth, *Michigan State University*
Christa Bouwman, *Case Western Reserve University*
Su-Jane Chen, *Metropolitan State University of Denver*
Paul Chiou, *Shippensburg University*
Bruce Costa, *University of Montana*
Maria de Boyrie, *New Mexico State University*
Isabelle Delalex, *Pace University*
David Diehl, *Aurora University*
Robert Duvic, *University of Texas at Austin*
Alan Eastman, *Indiana University of Pennsylvania*
Yee-Tien Fu, *Stanford University*
Kimberly Goodwin, *University of Southern Mississippi*
Janet Hamilton, *Portland State University*
Karen Hamilton, *Georgia Southern University*
Mahfuzul Haque, *Indiana State University, Terre Haute*
Corrine Hasbany, *Rivier College*
Rodrigo Hernandez, *Radford University*
Vanessa Holmes, *Penn State Worthington, Scranton*
Gary Kayakachoian, *University of Rhode Island*
Gregory Kivenzor, *Oregon State University*
V. Sivarama Krishnan, *University of Central Oklahoma*
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Ali Ozbeki, *Oakland University*
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Michael Sullivan, *University of Nevada, Las Vegas*
Alex Tang, *Morgan State University*
Antoinette Tessmer, *Michigan State University*
John Thornton, *Kent State University*
Charles Wellens, *North Idaho College*
J. Douglas Wellington, *Husson University*
Jill Wetmore, *Saginaw Valley State University*
Casey Whilhelm, *North Idaho College*

We owe a special thanks to Joseph Smolira of Belmont University for his work on this book. Joe worked closely with us to develop portions of the Instructor's Manual, along with the many vignettes and real-world examples. In addition, we would like to thank Bruce Costa, University of Montana, for his work on the PowerPoint and Instructor's Manual, and for his revision of the Test Bank. We would also like to thank Kay Johnson for her terrific work and attention to detail in proofreading our supplements.

Doctoral student Steve Hailey did outstanding work on this edition. To him fell the unenviable task of technical proofreading, and in particular, careful checking of each calculation throughout the text and Instructor's Manual.

Finally, in every phase of this project, we have been privileged to have had the complete and unwavering support of a great organization, McGraw-Hill Education. We especially thank the McGraw-Hill Education sales organization. The suggestions they provide, their professionalism in assisting potential adopters, and the service they provide have been a major factor in our success.

We are deeply grateful to the select group of professionals who served as our development team on this edition: Chuck Synovec, executive brand manager; Jennifer Upton, development editor; Melissa Caughlin, executive marketing manager; Christine Vaughan, content project manager; Brian Nacik, content project manager; Matt Diamond, senior designer; and Carol Bielski, senior buyer. Others at McGraw-Hill Education, too numerous to list here, have improved the book in countless ways.

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

Throughout the development of this edition, we have taken great care to discover and eliminate errors. Our goal is to provide the best textbook available on the subject. To ensure that future editions are error-free, we gladly offer $10 per arithmetic error to the first individual reporting it as a modest token of our appreciation. More than this, we would like to hear from instructors and students alike. Please write and tell us how to make this a better text. Forward your comments to: Dr. Brad Jordan, c/o Editorial–Finance, McGraw-Hill Education, 1333 Burr Ridge Parkway, Burr Ridge, IL 60527, or visit us online at www.mhhe.com/rwj.

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—Randolph W. Westerfield

—Jeffrey F. Jaffe

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BRIEF CONTENTS

PART ONE **OVERVIEW**

CHAPTER ONE Introduction to Corporate Finance 1
CHAPTER TWO Financial Statements and Cash Flow 19
CHAPTER THREE Financial Statements Analysis and Financial Models 43

PART TWO **VALUATION AND CAPITAL BUDGETING**

CHAPTER FOUR Discounted Cash Flow Valuation 82
CHAPTER FIVE Interest Rates and Bond Valuation 129
CHAPTER SIX Stock Valuation 164
CHAPTER SEVEN Net Present Value and Other Investment Rules 195
CHAPTER EIGHT Making Capital Investment Decisions 230
CHAPTER NINE Risk Analysis, Real Options, and Capital Budgeting 261

PART THREE **RISK AND RETURN**

CHAPTER TEN Risk and Return: Lessons from Market History 287
CHAPTER ELEVEN Return and Risk: The Capital Asset Pricing Model (CAPM) 316
CHAPTER TWELVE Risk, Cost of Capital, and Valuation 357

PART FOUR **CAPITAL STRUCTURE AND DIVIDEND POLICY**

CHAPTER THIRTEEN Efficient Capital Markets and Behavioral Challenges 390
CHAPTER FOURTEEN Capital Structure: Basic Concepts 423
CHAPTER FIFTEEN Capital Structure: Limits to the Use of Debt 452
CHAPTER SIXTEEN Dividends and Other Payouts 481

PART FIVE **SPECIAL TOPICS**

CHAPTER SEVENTEEN Options and Corporate Finance 516
CHAPTER EIGHTEEN Short-Term Finance and Planning 551
CHAPTER NINETEEN Raising Capital 583
CHAPTER TWENTY International Corporate Finance 619
CHAPTER TWENTY ONE Mergers and Acquisitions (web only)

APPENDIX A Mathematical Tables 645
APPENDIX B Solutions to Selected End-of-Chapter Problems 654
APPENDIX C Using the HP 10B and TI BA II Plus Financial Calculators 659

Indexes 663

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CONTENTS

PART ONE OVERVIEW

CHAPTER ONE
Introduction to Corporate Finance 1

1.1 What Is Corporate Finance? 1
The Balance Sheet Model of the Firm 1
The Financial Manager 3
1.2 The Corporate Firm 4
The Sole Proprietorship 4
The Partnership 4
The Corporation 5
A Corporation by Another Name . . . 6
1.3 The Importance of Cash Flows 7
1.4 The Goal of Financial Management 9
Possible Goals 10
The Goal of Financial Management 10
A More General Goal 11
1.5 The Agency Problem and Control of the Corporation 11
Agency Relationships 12
Management Goals 12
Do Managers Act in the Stockholders' Interests? 13
Stakeholders 14
1.6 Regulation 14
The Securities Act of 1933 and the Securities Exchange Act of 1934 16
Summary and Conclusions 16
Closing Case: East Coast Yachts 18

CHAPTER TWO
Financial Statements and Cash Flow 19

2.1 The Balance Sheet 19
Accounting Liquidity 20
Debt versus Equity 21
Value versus Cost 21
2.2 The Income Statement 22
Generally Accepted Accounting Principles 22
Noncash Items 23
Time and Costs 24
2.3 Taxes 24
Corporate Tax Rates 24
Average versus Marginal Tax Rates 25
2.4 Net Working Capital 27
2.5 Cash Flow of the Firm 28
2.6 The Accounting Statement of Cash Flows 31
Cash Flow from Operating Activities 31
Cash Flow from Investing Activities 32
Cash Flow from Financing Activities 32
Summary and Conclusions 33
Closing Case: Cash Flows at East Coast Yachts 41

CHAPTER THREE
Financial Statements Analysis and Financial Models 43

3.1 Financial Statements Analysis 43
Standardizing Statements 43
Common-Size Balance Sheets 44
Common-Size Income Statements 45
3.2 Ratio Analysis 46
Short-Term Solvency or Liquidity Measures 47
Long-Term Solvency Measures 49
Asset Management or Turnover Measures 50
Profitability Measures 52
Market Value Measures 53
3.3 The DuPont Identity 56
A Closer Look at ROE 56
Problems with Financial Statement Analysis 58

3.4 Financial Models 59
A Simple Financial Planning Model 59
The Percentage of Sales Approach 61
3.5 External Financing and Growth 66
EFN and Growth 66
Financial Policy and Growth 68
A Note about Sustainable Growth Rate Calculations 71
3.6 Some Caveats Regarding Financial Planning Models 72
Summary and Conclusions 73
Closing Case: Ratios and Financial Planning at East Coast Yachts 79

PART TWO VALUATION AND CAPITAL BUDGETING

CHAPTER FOUR
Discounted Cash Flow Valuation 82

4.1 Valuation: The One-Period Case 82
4.2 The Multiperiod Case 85
Future Value and Compounding 85
The Power of Compounding: A Digression 88
Present Value and Discounting 89
The Algebraic Formula 93
4.3 Compounding Periods 94
Distinction between Stated Annual Interest Rate and Effective Annual Rate 96
Compounding over Many Years 98
Continuous Compounding 98
4.4 Simplifications 100
Perpetuity 100
Growing Perpetuity 101
Annuity 103
Trick 1: A Delayed Annuity 105
Trick 2: Annuity Due 106
Trick 3: The Infrequent Annuity 107
Trick 4: Equating Present Value of Two Annuities 107
Growing Annuity 108
4.5 Loan Types and Loan Amortization 110
Pure Discount Loans 110
Interest-Only Loans 110
Amortized Loans 111
4.6 What Is a Firm Worth? 114
Summary and Conclusions 116
Closing Case: The MBA Decision 127

CHAPTER FIVE
Interest Rates and Bond Valuation 129

5.1 Bonds and Bond Valuation 129
Bond Features and Prices 130
Bond Values and Yields 130
Interest Rate Risk 133
Finding the Yield to Maturity: More Trial and Error 135
5.2 More on Bond Features 136
Long-Term Debt: The Basics 138
The Indenture 139
Terms of a Bond 139
Security 140
Seniority 140
Repayment 140
The Call Provision 141
Protective Covenants 141
5.3 Bond Ratings 142
5.4 Some Different Types of Bonds 143
Government Bonds 143
Zero Coupon Bonds 144
Floating-Rate Bonds 145
Other Types of Bonds 145
5.5 Bond Markets 147
How Bonds Are Bought and Sold 147
Bond Price Reporting 147
A Note on Bond Price Quotes 150
5.6 Inflation and Interest Rates 151
Real versus Nominal Rates 151
The Fisher Effect 152
5.7 Determinants of Bond Yields 153
The Term Structure of Interest Rates 153
Bond Yields and the Yield Curve: Putting It All Together 154
Conclusion 156
Summary and Conclusions 156
Closing Case: Financing East Coast Yachts' Expansion Plans With a Bond Issue 162

CHAPTER SIX
Stock Valuation 164

6.1 The Present Value of Common Stocks 164
Dividends versus Capital Gains 164
Valuation of Different Types of Stocks 165
Case 1 (Zero Growth) 166
Case 2 (Constant Growth) 166
Case 3 (Differential Growth) 167

6.2 Estimates of Parameters in the Dividend Discount Model 169
Where Does g *Come From? 169*
Where Does R *Come From? 170*
A Healthy Sense of Skepticism 172
Total Payout 173
The No-Payout Firm 173
6.3 Comparables 174
Price-to-Earnings Ratio 174
Enterprise Value Ratios 176
6.4 Valuing Stocks Using Free Cash Flows 177
6.5 Some Features of Common and Preferred Stocks 178
Common Stock Features 178
Shareholder Rights 179
Proxy Voting 180
Classes of Stock 180
Other Rights 181
Dividends 181
Preferred Stock Features 181
Stated Value 182
Cumulative and Noncumulative Dividends 182
Is Preferred Stock Really Debt? 182
6.6 The Stock Markets 182
Dealers and Brokers 183
Organization of the NYSE 183
Members 183
Operations 184
Floor Activity 184
NASDAQ Operations 185
ECNs 187
Stock Market Reporting 188
Summary and Conclusions 188
Closing Case: Stock Valuation at Ragan Engines 194

CHAPTER SEVEN
Net Present Value and Other Investment Rules 195
7.1 Why Use Net Present Value? 195
7.2 The Payback Period Method 197
Defining the Rule 197
Problems with the Payback Method 198
Problem 1: Timing of Cash Flows Within the Payback Period 199
Problem 2: Payments after the Payback Period 199
Problem 3: Arbitrary Standard for Payback Period 199
Managerial Perspective 199
Summary of Payback 200
7.3 The Discounted Payback Period Method 200
7.4 The Average Accounting Return Method 201
Defining the Rule 201
Step 1: Determining Average Net Income 202
Step 2: Determining Average Investment 202
Step 3: Determining AAR 202
Analyzing the Average Accounting Return Method 202
7.5 The Internal Rate of Return 203
7.6 Problems with the IRR Approach 206
Definition of Independent and Mutually Exclusive Projects 206
Two General Problems Affecting Both Independent and Mutually Exclusive Projects 206
Problem 1: Investing or Financing? 206
Problem 2: Multiple Rates of Return 208
NPV Rule 208
Modified IRR 209
The Guarantee Against Multiple IRRs 209
General Rules 210
Problems Specific to Mutually Exclusive Projects 210
The Scale Problem 210
The Timing Problem 212
Redeeming Qualities of IRR 214
A Test 214
7.7 The Profitability Index 215
Calculation of Profitability Index 215
Application of the Profitability Index 215
7.8 The Practice of Capital Budgeting 217
Summary and Conclusions 219
Closing Case: Bullock Gold Mining 229

CHAPTER EIGHT
Making Capital Investment Decisions 230
8.1 Incremental Cash Flows 230
Cash Flows—Not Accounting Income 230
Sunk Costs 231
Opportunity Costs 231
Side Effects 232
Allocated Costs 232
8.2 The Baldwin Company: An Example 233
An Analysis of the Project 234
Investments 234
Income and Taxes 235

Salvage Value 236
Cash Flow 237
Net Present Value 237
Which Set of Books? 237
A Note on Net Working Capital 237
A Note on Depreciation 238
Interest Expense 239
8.3 Inflation and Capital Budgeting 239
Discounting: Nominal or Real? 240
8.4 Alternative Definitions of Operating Cash Flow 242
The Bottom-Up Approach 243
The Top-Down Approach 243
The Tax Shield Approach 243
Conclusion 244
8.5 Investments of Unequal Lives: The Equivalent Annual Cost Method 244
The General Decision to Replace 246
Summary and Conclusions 248
Closing Case: Expansion at East Coast Yachts 259
Bethesda Mining Company 259

CHAPTER NINE
Risk Analysis, Real Options, and Capital Budgeting 261
9.1 Decision Trees 261
Warning 263
9.2 Sensitivity Analysis, Scenario Analysis, and Break-Even Analysis 263
Sensitivity Analysis And Scenario Analysis 263
Revenues 264
Costs 265
Break-Even Analysis 267
Accounting Profit 267
Financial Break-Even 269
9.3 Monte Carlo Simulation 270
Step 1: Specify the Basic Model 270
Step 2: Specify a Distribution for Each Variable in the Model 270
Step 3: The Computer Draws One Outcome 272
Step 4: Repeat the Procedure 272
Step 5: Calculate NPV 272
9.4 Real Options 273
The Option to Expand 273
The Option to Abandon 274
Timing Options 276
Summary and Conclusions 277
Closing Case: Bunyan Lumber, LLC 285

PART THREE RISK AND RETURN

CHAPTER TEN
Risk and Return: Lessons from Market History 287
10.1 Returns 287
Dollar Returns 287
Percentage Returns 289
10.2 Holding Period Returns 291
10.3 Return Statistics 297
10.4 Average Stock Returns and Risk-Free Returns 298
10.5 Risk Statistics 300
Variance 300
Normal Distribution and Its Implications for Standard Deviation 301
10.6 The U.S. Equity Risk Premium: Historical and International Perspectives 302
10.7 2008: A Year of Financial Crisis 305
10.8 More on Average Returns 306
Arithmetic versus Geometric Averages 306
Calculating Geometric Average Returns 307
Arithmetic Average Return or Geometric Average Return? 308
Summary and Conclusions 309
Closing Case: A Job at East Coast Yachts, Part 1 313

CHAPTER ELEVEN
Return and Risk: The Capital Asset Pricing Model (CAPM) 316
11.1 Individual Securities 316
11.2 Expected Return, Variance, and Covariance 317
Expected Return and Variance 317
Covariance and Correlation 318
11.3 The Return and Risk for Portfolios 321
The Expected Return on a Portfolio 321
Variance and Standard Deviation of a Portfolio 322
The Variance 322
Standard Deviation of a Portfolio 322
The Diversification Effect 323
An Extension to Many Assets 324
11.4 The Efficient Set 324
The Two-Asset Case 324
The Efficient Set for Many Securities 328

11.5 Riskless Borrowing and Lending 329
The Optimal Portfolio 331
11.6 Announcements, Surprises, and Expected Returns 333
Expected and Unexpected Returns 333
Announcements and News 334
11.7 Risk: Systematic and Unsystematic 335
Systematic and Unsystematic Risk 335
Systematic and Unsystematic Components of Return 335
11.8 Diversification and Portfolio Risk 336
The Effect of Diversification: Another Lesson from Market History 336
The Principle of Diversification 336
Diversification and Unsystematic Risk 338
Diversification and Systematic Risk 338
11.9 Market Equilibrium 339
Definition of the Market Equilibrium Portfolio 339
Definition of Risk When Investors Hold the Market Portfolio 339
The Formula for Beta 342
A Test 343
11.10 Relationship Between Risk and Expected Return (CAPM) 344
Expected Return on Individual Security 344
Summary and Conclusions 347
Closing Case: A Job at East Coast Yachts, Part 2 356

CHAPTER TWELVE
Risk, Cost of Capital, and Valuation 357
12.1 The Cost of Equity Capital 357
12.2 Estimating the Cost of Equity Capital with the CAPM 358
The Risk-Free Rate 360
Market Risk Premium 361
Method 1: Using Historical Data 361
Method 2: Using the Dividend Discount Model (DDM) 361
12.3 Estimation of Beta 362
Real-World Betas 362
Stability of Beta 363
Using an Industry Beta 364
12.4 Determinants of Beta 365
Cyclicality of Revenues 365
Operating Leverage 366
Financial Leverage and Beta 366
12.5 Dividend Discount Model 367
Comparison of DDM and CAPM 368
12.6 Cost of Capital for Divisions and Projects 369
12.7 Cost of Fixed Income Securities 370
Cost of Debt 370
Cost of Preferred Stock 371
12.8 The Weighted Average Cost of Capital 372
12.9 Valuation With R_{WACC} 374
Project Evaluation and the R_{WACC} *374*
Firm Valuation with the R_{WACC} *374*
12.10 Estimating Eastman Chemical's Cost of Capital 377
Eastman's Cost of Equity 377
Eastman's Cost of Debt 378
Eastman's WACC 379
12.11 Flotation Costs and the Weighted Average Cost of Capital 380
The Basic Approach 380
Flotation Costs and NPV 381
Internal Equity and Flotation Costs 382
Summary and Conclusions 382
Closing Case: The Cost of Capital for Goff Computer, Inc. 389

PART FOUR CAPITAL STRUCTURE AND DIVIDEND POLICY

CHAPTER THIRTEEN
Efficient Capital Markets and Behavioral Challenges 390
13.1 A Description of Efficient Capital Markets 390
Foundations of Market Efficiency 392
Rationality 392
Independent Deviations from Rationality 392
Arbitrage 393
13.2 The Different Types of Efficiency 393
The Weak Form 393
The Semistrong and Strong Forms 393
Some Common Misconceptions about the Efficient Market Hypothesis 395
The Efficacy of Dart Throwing 395
Price Fluctuations 396
Stockholder Disinterest 396
13.3 The Evidence 396
The Weak Form 396
The Semistrong Form 398
Event Studies 398
The Record of Mutual Funds 400
The Strong Form 401
13.4 The Behavioral Challenge to Market Efficiency 401

Rationality 401
Independent Deviations from Rationality 402
Arbitrage 402
13.5 Empirical Challenges to Market Efficiency 403
13.6 Reviewing the Differences 408
Representativeness 409
Conservatism 409
13.7 Implications for Corporate Finance 409
1. Accounting Choices, Financial Choices, and Market Efficiency 410
2. The Timing Decision 410
3. Speculation and Efficient Markets 413
4. Information in Market Prices 413
Summary and Conclusions 415
Closing Case: Your 401(K) Account at East Coast Yachts 421

CHAPTER FOURTEEN

Capital Structure: Basic Concepts 423

14.1 The Capital Structure Question and the Pie Theory 423
14.2 Maximizing Firm Value versus Maximizing Stockholder Interests 424
14.3 Financial Leverage and Firm Value: An Example 426
Leverage and Returns to Shareholders 426
The Choice between Debt and Equity 428
A Key Assumption 430
14.4 Modigliani and Miller: Proposition II (No Taxes) 430
Risk to Equityholders Rises with Leverage 430
Proposition II: Required Return to Equityholders Rises with Leverage 431
MM: An Interpretation 436
14.5 Taxes 437
The Basic Insight 437
Present Value of the Tax Shield 439
Value of the Levered Firm 439
Expected Return and Leverage under Corporate Taxes 441
The Weighted Average Cost of Capital (R_{WACC}) and Corporate Taxes 442
Stock Price and Leverage under Corporate Taxes 442
Summary and Conclusions 444
Closing Case: Stephenson Real Estate Recapitalization 450

CHAPTER FIFTEEN

Capital Structure: Limits to the Use of Debt 452

15.1 Costs of Financial Distress 452
Direct Bankruptcy Costs 453
Indirect Bankruptcy Costs 453
Agency Costs 454
Summary of Selfish Strategies 456
15.2 Can Costs of Debt be Reduced? 457
Protective Covenants 457
Consolidation of Debt 458
15.3 Integration of Tax Effects and Financial Distress Costs 458
Pie Again 458
15.4 Signaling 461
15.5 Shirking, Perquisites, and Bad Investments: A Note on Agency Cost of Equity 462
Effect of Agency Costs of Equity on Debt-Equity Financing 464
Free Cash Flow 464
15.6 The Pecking-Order Theory 465
Rules of the Pecking Order 466
Rule #1 Use Internal Financing 466
Rule #2 Issue Safe Securities First 467
Implications 467
15.7 How Firms Establish Capital Structure 468
15.8 A Quick Look at the Bankruptcy Process 473
Liquidation and Reorganization 473
Bankruptcy Liquidation 473
Bankruptcy Reorganization 474
Financial Management and the Bankruptcy Process 475
Agreements to Avoid Bankruptcy 476
Summary and Conclusions 476
Closing Case: McKenzie Corporation's Capital Budgeting 480

CHAPTER SIXTEEN

Dividends and Other Payouts 481

16.1 Different Types of Dividends 481
16.2 Standard Method of Cash Dividend Payment 482
16.3 The Benchmark Case: An Illustration of the Irrelevance of Dividend Policy 484
Current Policy: Dividends Set Equal to Cash Flow 484
Alternative Policy: Initial Dividend Is Greater than Cash Flow 484
The Indifference Proposition 485

Homemade Dividends 486
A Test 487
Dividends and Investment Policy 487
16.4 Repurchase of Stock 488
Dividend versus Repurchase: Conceptual Example 489
Dividends versus Repurchases: Real-World Considerations 490
1. Flexibility 490
2. Executive Compensation 490
3. Offset to Dilution 490
4. Undervaluation 490
5. Taxes 491
16.5 Personal Taxes, Issuance Costs, and Dividends 491
Firms without Sufficient Cash to Pay a Dividend 491
Firms with Sufficient Cash to Pay a Dividend 492
Summary on Personal Taxes 493
16.6 Real-World Factors Favoring A High-Dividend Policy 493
Desire for Current Income 494
Behavioral Finance 495
Agency Costs 496
Information Content of Dividends and Dividend Signaling 496
16.7 The Clientele Effect: A Resolution of Real-World Factors? 497
16.8 What We Know and Do Not Know about Dividend Policy 498
Corporate Dividends Are Substantial 498
Fewer Companies Pay Dividends 499
Corporations Smooth Dividends 500
Some Survey Evidence about Dividends 501
16.9 Putting It All Together 502
16.10 Stock Dividends and Stock Splits 504
Example of a Small Stock Dividend 505
Example of a Stock Split 505
Example of a Large Stock Dividend 506
Value of Stock Splits and Stock Dividends 506
The Benchmark Case 506
Popular Trading Range 506
Reverse Splits 507
Summary and Conclusions 508
Closing Case: Electronic Timing, Inc. 514

PART FIVE SPECIAL TOPICS

CHAPTER SEVENTEEN

Options and Corporate Finance 516

17.1 Options 516
17.2 Call Options 517
The Value of a Call Option at Expiration 517
17.3 Put Options 518
The Value of a Put Option at Expiration 518
17.4 Selling Options 520
17.5 Option Quotes 521
17.6 Combinations of Options 522
17.7 Valuing Options 525
Bounding the Value of a Call 525
Lower Bound 525
Upper Bound 525
The Factors Determining Call Option Values 525
Exercise Price 525
Expiration Date 526
Stock Price 526
The Key Factor: The Variability of the Underlying Asset 527
The Interest Rate 528
A Quick Discussion of Factors Determining Put Option Values 528
17.8 An Option Pricing Formula 529
A Two-State Option Model 530
Determining the Delta 530
Determining the Amount of Borrowing 531
Risk-Neutral Valuation 531
The Black-Scholes Model 532
17.9 Stocks and Bonds as Options 536
The Firm Expressed in Terms of Call Options 537
The Stockholders 537
The Bondholders 538
The Firm Expressed in Terms of Put Options 538
The Stockholders 538
The Bondholders 539
A Resolution of the Two Views 539
A Note on Loan Guarantees 540
Summary and Conclusions 541
Closing Case: Exotic Cuisines Employee Stock Options 549

CHAPTER EIGHTEEN

Short-Term Finance and Planning 551

18.1 Tracing Cash and Net Working Capital 552
18.2 The Operating Cycle and the Cash Cycle 553
Defining the Operating and Cash Cycles 553
The Operating Cycle 554
The Cash Cycle 554
The Operating Cycle and the Firm's Organization Chart 555

Calculating the Operating and Cash Cycles 555
The Operating Cycle 557
The Cash Cycle 558
Interpreting the Cash Cycle 559
18.3 Some Aspects of Short-Term Financial Policy 559
The Size of the Firm's Investment in Current Assets 560
Alternative Financing Policies for Current Assets 561
An Ideal Case 561
Different Policies For Financing Current Assets 563
Which Financing Policy Is Best? 564
Current Assets and Liabilities in Practice 565
18.4 The Cash Budget 565
Sales and Cash Collections 566
Cash Outflows 567
The Cash Balance 567
18.5 Short-Term Borrowing 568
Unsecured Loans 568
Compensating Balances 569
Cost of a Compensating Balance 569
Letters of Credit 569
Secured Loans 570
Accounts Receivable Financing 570
Inventory Loans 571
Commercial Paper 571
Trade Credit 571
Understanding Trade Credit Terms 571
Cash Discounts 571
18.6 A Short-Term Financial Plan 572
Summary and Conclusions 573
Closing Case: Keafer Manufacturing Working Capital Management 582

CHAPTER NINETEEN
Raising Capital 583
19.1 Early-Stage Financing and Venture Capital 583
Venture Capital 584
Stages of Financing 586
Some Venture Capital Realities 586
Crowdfunding 587
19.2 Selling Securities to the Public: The Basic Procedure 587
19.3 Alternative Issue Methods 588
19.4 Underwriters 590
Choosing an Underwriter 590
Types of Underwriting 591
Firm Commitment Underwriting 591
Best Efforts Underwriting 591
Dutch Auction Underwriting 591
The Green Shoe Provision 592
The Aftermarket 592
Lockup Agreements 592
The Quiet Period 593
19.5 IPOs and Underpricing 593
Evidence on Underpricing 594
IPO Underpricing: The 1999–2000 Experience 595
Why Does Underpricing Exist? 597
The Partial Adjustment Phenomenon 599
19.6 What CFOs Say About the IPO Process 600
19.7 SEOs and the Value of the Firm 600
19.8 The Cost of Issuing Securities 601
19.9 Rights 604
The Mechanics of a Rights Offering 606
Subscription Price 606
Number of Rights Needed to Purchase a Share 607
Effect of Rights Offering on Price of Stock 607
Effects on Shareholders 609
The Underwriting Arrangements 609
The Rights Puzzle 609
19.10 Dilution 610
Dilution of Proportionate Ownership 610
Dilution of Value: Book versus Market Values 610
A Misconception 611
The Correct Arguments 611
19.11 Issuing Long-Term Debt 612
19.12 Shelf Registration 612
Summary and Conclusions 613
Closing Case: East Coast Yachts Goes Public 618

CHAPTER TWENTY
International Corporate Finance 619
20.1 Terminology 620
20.2 Foreign Exchange Markets and Exchange Rates 621
Exchange Rates 622
Exchange Rate Quotations 622
Cross-Rates and Triangle Arbitrage 623
Types of Transactions 624
20.3 Purchasing Power Parity 625
Absolute Purchasing Power Parity 625

Relative Purchasing Power Parity 627
The Basic Idea 627
The Result 628
Currency Appreciation and Depreciation 629
20.4 Interest Rate Parity, Unbiased Forward Rates, and the International Fisher Effect 629
Covered Interest Arbitrage 629
Interest Rate Parity 631
Forward Rates and Future Spot Rates 631
Putting It All Together 632
Uncovered Interest Parity 632
The International Fisher Effect 632
20.5 International Capital Budgeting 633
Method 1: The Home Currency Approach 634
Method 2: The Foreign Currency Approach 634
Unremitted Cash Flows 635
20.6 Exchange Rate Risk 635
Short-Run Exposure 635
Long-Run Exposure 636
Translation Exposure 637
Managing Exchange Rate Risk 638
20.7 Political Risk 638
Summary and Conclusions 639
Closing Case: East Coast Yachts Goes International 644

CHAPTER TWENTY ONE
Mergers and Acquisitions (web only)

APPENDIX A
Mathematical Tables 645

APPENDIX B
Solutions to Selected End-of-Chapter Problems 654

APPENDIX C
Using the HP 10B and TI BA II Plus Financial Calculators 659

NAME INDEX 663

COMPANY INDEX 665

SUBJECT INDEX 668

LIST OF BOXES

FINANCE MATTERS

CHAPTER 1 Sarbanes-Oxley 15

CHAPTER 2 What is Warren Buffett's Tax Rate? 27

CHAPTER 3 What's in a Ratio? 59

CHAPTER 4 Jackpot! 97

CHAPTER 5 Beauty Is in the Eye of the Bondholder 146

CHAPTER 6 How Fast Is Too Fast? 172
The Wild, Wild West of Stock Trading 186

CHAPTER 9 When Things Go Wrong . . . 264

CHAPTER 11 Beta, Beta, Who's Got the Beta? 343

CHAPTER 12 The Cost of Capital, Texas Style 378

CHAPTER 13 Can Stock Market Investors Add and Subtract? 405

CHAPTER 16 Stock Buybacks: No End in Sight 494

CHAPTER 18 A Look at Operating and Cash Cycles 556

CHAPTER 19 IPO Underpricing around the World 597
Anatomy of an IPO 604

CHAPTER 20 McPricing 627

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Introduction to Corporate Finance

1

OPENING CASE

Compensation of corporate executives in the United States continues to be a hot-button issue. Many have argued that CEO pay has grown to exorbitant levels (at least in some cases). In July 2010, the Dodd-Frank Wall Street Reform and Consumer Protection Act became law. The "say on pay" portion of the bill requires that, beginning in January 2011, corporations with a market value over $75 million must allow a nonbinding shareholder vote on executive pay. (Note that because the bill applies to corporations, it does not give voters a "say on pay" for U.S. representatives and senators.)

Specifically, the measure allows shareholders to approve or disapprove a company's executive compensation plans. Because the bill is nonbinding, it does not permit shareholders to veto a compensation package and does not place limits on executive pay. In February 2011, the shareholders of Beazer Homes USA and Jacobs Engineering Group became the first to vote against executive compensation under the new law. Of course, these companies weren't alone. For example, in April 2012, Citigroup's shareholders voted against the bank's proposed executive compensation plan that promised bonuses to top officers even if the bank's pretax profits dropped by 50 percent. Going forward, British companies may find it even more difficult to set executive pay. In 2012, the British government announced that it was proposing a binding shareholder say on pay vote in the U.K.

Understanding how a corporation sets executive pay, and the role of shareholders in that process, takes us into issues involving the corporate form of organization, corporate goals, and corporate control, all of which we cover in this chapter.

1.1 What Is Corporate Finance?

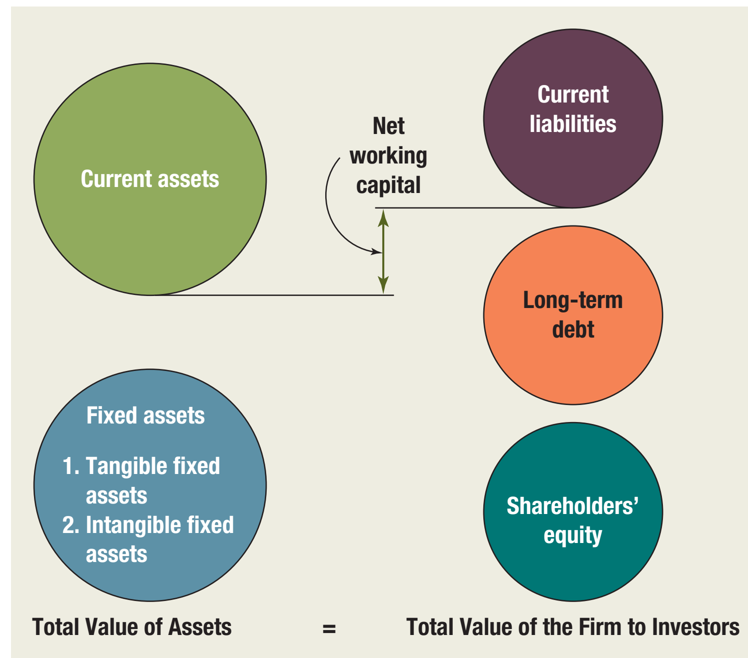
Suppose you decide to start a firm to make tennis balls. To do this you hire managers to buy raw materials, and you assemble a workforce that will produce and sell finished tennis balls. In the language of finance, you make an investment in assets such as inventory, machinery, land, and labor. The amount 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.

FIGURE 1.1

The Balance Sheet Model of the Firm



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 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 liabilities, 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

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 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.

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

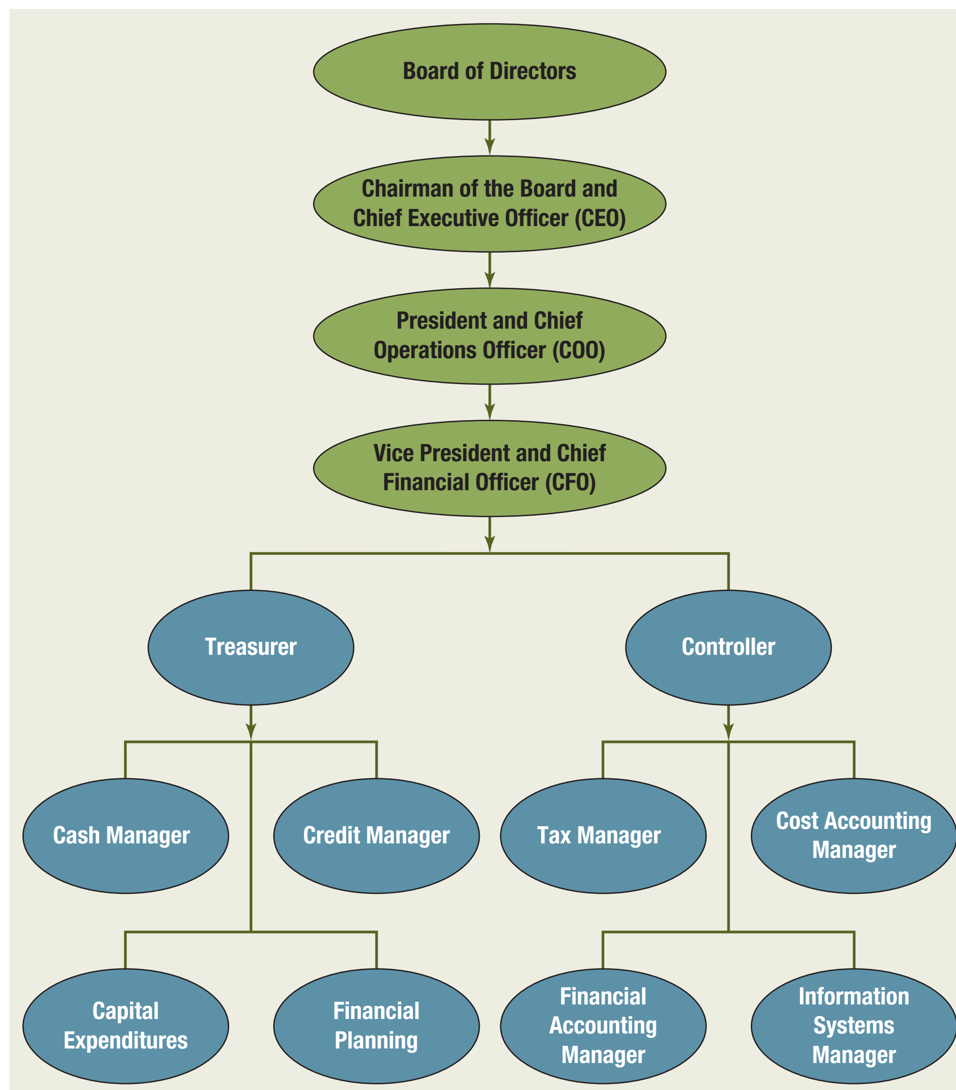


FIGURE 1.2
Hypothetical Organization Chart

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 or 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 Computer, 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.

To find out more about LLCs, visit www.incorporate.com.

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 1.1 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.

TABLE 1.2 International Corporations

		TYPE OF COMPANY	
COMPANY	COUNTRY OF ORIGIN	IN ORIGINAL LANGUAGE	INTERPRETATION
Bayerische Motoren Werke (BMW) AG	Germany	Aktiengesellschaft	Corporation
Rolls-Royce PLC	United Kingdom	Public limited company	Public limited 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 1.2 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.

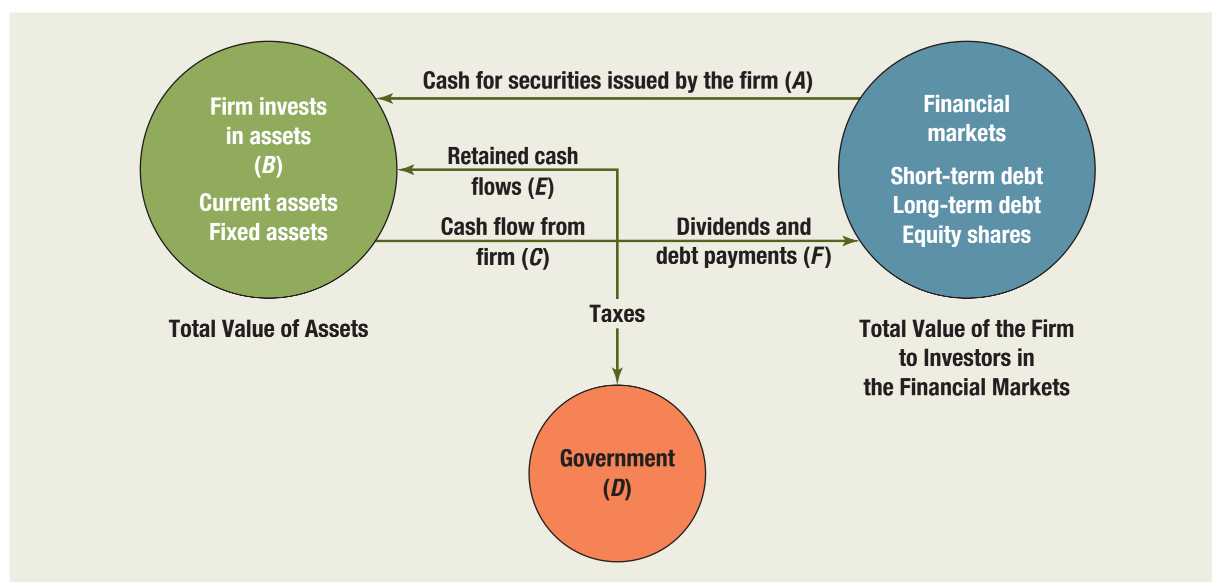
1.3 The Importance of Cash Flows

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 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. To see how this is done, we can trace the cash flows from the firm to the financial markets and back again.

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 markets and back again. Suppose we begin with the firm's financing activities. To raise money, the firm sells

FIGURE 1.3 Cash Flows between the Firm and the Financial Markets



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 accounting 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*. Bond and stock prices reflect this preference for earlier cash, and we will see how to use them to decide between *A* and *B*.

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.