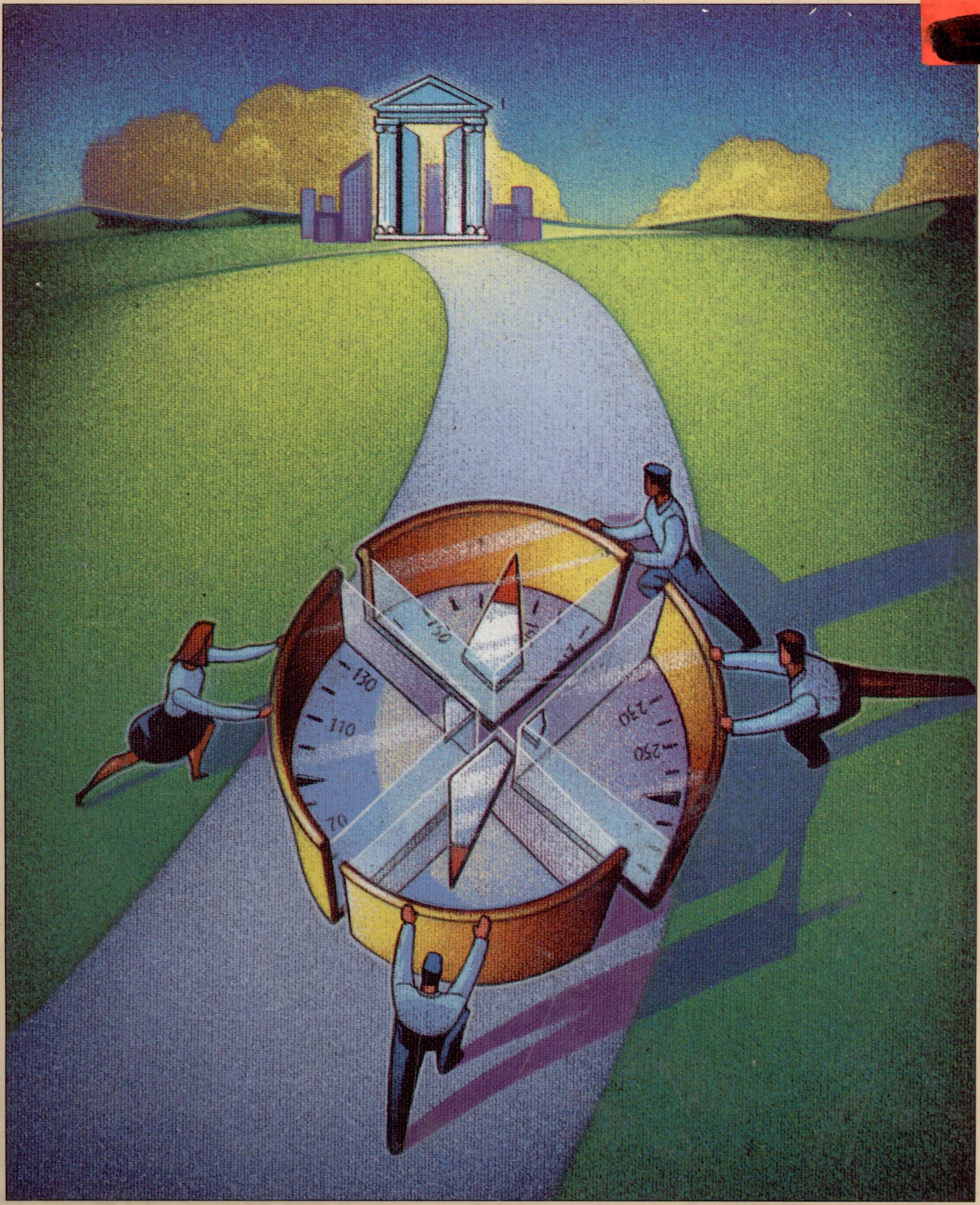
Alternate Edition

Ross **Westerfield** **Jordan**



Fundamentals of

Fifth Edition

Corporate Finance

Alternate Edition

Fundamentals of Corporate Finance

Stephen A. Ross
Massachusetts Institute of Technology

Randolph W. Westerfield
University of Southern California

Bradford D. Jordan
University of Kentucky

Fifth Edition

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S.A.R. R.W.W. B.D.J.

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FUNDAMENTALS OF CORPORATE FINANCE

This book is printed on acid-free paper.

domestic 1 2 3 4 5 6 7 8 9 0 VNH/VNH 9 0 9 8 7 6 5 4 3 2 1 0 9
international 1 2 3 4 5 6 7 8 9 0 VNH/VNH 9 0 9 8 7 6 5 4 3 2 1 0 9

ISBN 0-07-231289-0 (standard edition)
ISBN 0-07-366128-7 (alternate edition)
ISBN 0-07-231290-4 (annotated instructor's edition)

Vice president/Editor-in-chief: *Michael W. Junior*
Publisher: *Craig S. Beytien*
Senior sponsoring editor: *Randall Adams*
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Senior designer: *Michael Warrell*
Cover illustrator: *©David Tillinghast*
Supplement coordinator: *Becky Szura*
Compositor: *Carlisle Communications, Ltd.*
Typeface: *10/12 Times Roman*
Printer: *Von Hoffmann Press, Inc.*

Library of Congress Cataloging-in-Publication Data

Ross, Stephen A.
Fundamentals of corporate finance / Stephen A. Ross, Randolph W. Westerfield, Bradford D. Jordan.—5th ed.
p. cm.—(Irwin/McGraw-Hill series in finance, insurance, and real estate.)
Includes index.
ISBN (invalid) 0-07-232389-0 (standard)
1. Corporations—Finance. I. Westerfield, Randolph. II. Jordan, Bradford D. III. Title. IV. Series.
HG4026.R677 2000
658.15—dc21 99-27707

International Edition ISBN 0-07-116831-1

http://www.mhhe.com

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About the Authors

Stephen A. Ross
Massachusetts Institute of Technology

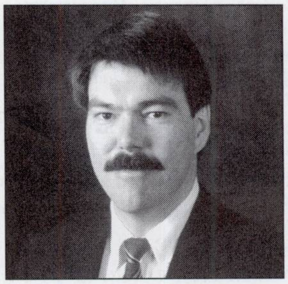
Stephen Ross is presently the Franco Modigliani Professor of Finance and Economics at the Sloan School of Management, Massachusetts Institute of Technology. One of the most widely published authors in finance and economics, Professor Ross is recognized for his work in developing the Arbitrage Pricing Theory and his substantial contributions to the discipline through his research in signaling, agency theory, option pricing, and the theory of the term structure of interest rates, among other topics. A past president of the American Finance Association, he currently serves as an associate editor of several academic and practitioner journals. He is a trustee of CalTech, a director of the College Retirement Equity Fund (CREF), and Freddie Mac. He is also the co-chairman of Roll and Ross Asset Management Corporation.

Randolph W. Westerfield
University of Southern California

Randolph W. Westerfield is Dean of the Marshall School of Business at University of Southern California and holder of the Robert R. Dockson Dean's Chair of Business Administration.

From 1988 to 1993, Professor Westerfield served as the chairman of the School's finance and business economics department and the Charles B. Thornton Professor of Finance. He came to USC from The Wharton School, University of Pennsylvania, where he was the chairman of the finance department and member of the finance faculty for 20 years. His areas of expertise include corporate financial policy, investment management and analysis, mergers and acquisitions, and stock market price behavior.

Professor Westerfield has served as a member of the Continental Bank trust committee, supervising all activities of the trust department. He has been consultant to a number of corporations, including AT&T, Mobil Oil and Pacific Enterprises, as well as to the United Nations, the U.S. Department of Justice and Labor, and the State of California.



Bradford D. Jordan
University of Kentucky

Bradford D. Jordan is Professor of Finance and Gatton Research Fellow in the Carol Martin Gatton College of Business and Economics at the University of Kentucky. He has a long-standing interest in both applied and theoretical issues in corporate finance, and has extensive experience teaching all levels of corporate finance and financial management policy. Professor Jordan has published numerous articles on issues such as cost of capital, capital structure, and the behavior of security prices.

Preface

From the Authors . . .

WHEN THE THREE OF US DECIDED TO WRITE A BOOK, we were united by one strongly held principle: Corporate finance should be developed in terms of a few integrated, powerful ideas. We felt that the subject was all too often presented as a collection of loosely related topics, unified primarily by virtue of being bound together in one book, and we thought there must be a better way.

One thing we knew for certain was that we didn't want to write a "me-too" book. So, with a lot of help, we took a hard look at what was truly important and useful. In doing so, we were led to eliminate topics of dubious relevance, 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.

As a result of this process, three basic themes became our central focus in writing *Fundamentals of Corporate Finance:*

An Emphasis on Intuition We always try to separate and explain the principles at work on a common sense, intuitive level before launching into any specifics. The underlying ideas are discussed first in very general terms and then by way of examples that illustrate in more concrete terms how a financial manager might proceed in a given situation.

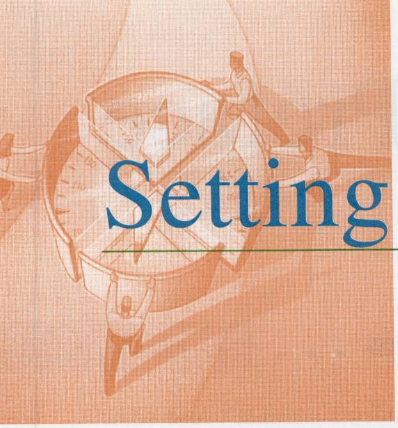
A Unified Valuation Approach We treat net present value (NPV) as the basic concept underlying corporate finance. Many texts stop well short of consistently integrating this important principle. The most basic and important notion, that NPV represents the excess of market value over cost, often is lost 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.

A Managerial Focus Students shouldn't lose sight of the fact that financial management concerns 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 finance, and, where appropriate, the approximate, pragmatic nature of financial analysis is made explicit, possible pitfalls are described, and limitations are discussed.

In retrospect, looking back to our 1991 first edition IPO, we had the same hopes and fears as any entrepreneurs. How would we be received in the market? At the time, we had no idea that just nine years later, we would be working on a fifth edition. We certainly never dreamed that in those years we would work with friends and colleagues from around the world to create country-specific Australian, Canadian, and South African editions, an International edition, Chinese, Polish, Portuguese, and Spanish language editions, and an entirely separate book, *Essentials of Corporate Finance*, now in its second edition.

Today, as we prepare to once more enter the market, our goal is to stick with the basic principles that have brought us this far. However, based on an enormous amount of feedback we have received from you and your colleagues, we have made this edition and its package even *more flexible* than previous editions. We offer flexibility in coverage, by continuing to offer a variety of editions, and flexibility in pedagogy, by providing a wide variety of features in the book to help students to learn about corporate finance. We also provide flexibility in package options by offering the most extensive collection of teaching, learning, and technology aids of any corporate finance text. Whether you use just the textbook, or the book in conjunction with other products, we believe you will find a combination with this edition that will meet your current as well as your changing needs.

Stephen A. Ross
Randolph W. Westerfield
Bradford D. Jordan



Setting a Clear Course

THIS BOOK WAS DESIGNED and developed explicitly for a first course in business or corporate finance, for both finance majors and non-majors alike. In terms of background or prerequisites, the book is nearly self-contained, assuming some familiarity with basic algebra and accounting principles, while still reviewing important accounting principles very early on. The organization of this text has been developed to give instructors the flexibility they need.

As with the previous edition of the book, we are offering a Standard Edition with 21 chapters, and an Alternate Edition with 25 chapters

Standard and Alternate Editions Table of Contents

Considers the goals of the corporation, the corporate form of organization, the agency problem, and, briefly, financial markets

Succinctly discusses cash flow versus accounting income, market value versus book value, taxes, and a review of financial statements

Part One
Overview of Corporate Finance
1 Introduction to Corporate Finance
2 Financial Statements, Taxes, and Cash Flow

This part can be omitted entirely if desired without affecting the flow of the other chapters

Contains a thorough discussion of the sustainable growth rate as a planning tool

Part Two
Financial Statements and Long-Term Financial Planning
3 Working with Financial Statements
4 Long-Term Financial Planning and Growth

First of two chapters covering time value of money, allowing for a building-block approach to this concept

Part Three
Valuation of Future Cash Flows
5 Introduction to Valuation: The Time Value of Money
6 Discounted Cash Flow Valuation
7 Interest Rates and Bond Valuation
8 Stock Valuation

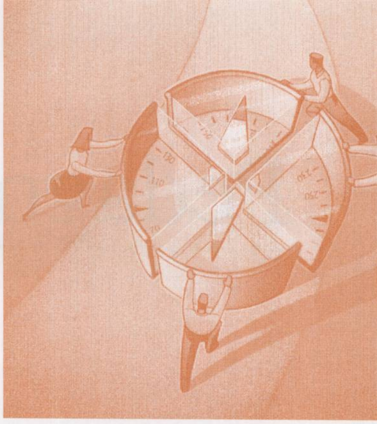
Contains an extensive discussion on NPV estimates

Part Four
Capital Budgeting
9 Net Present Value and Other Investment Criteria
10 Making Capital Investment Decisions
11 Project Analysis and Evaluation

Gives students a feel for typical rates of return on risky assets

Discusses the expected return/risk trade-off, and develops the security market line in a highly intuitive way that bypasses much of the usual portfolio theory and statistics

Part Five
Risk and Return
12 Some Lessons from Capital Market History
13 Return, Risk, and the Security Market Line



Part Six

Cost of Capital and Long-Term Financial Policy

14 Cost of Capital

15 Raising Capital

16 Financial Leverage and Capital Structure Policy

17 Dividends and Dividend Policy

Part Seven

Short-Term Financial Planning and Management

18 Short-Term Finance and Planning

19 Cash and Liquidity Management
Appendix 19A—Determining the Target Cash Balance

20 Credit and Inventory Management
Appendix 20A—More on Credit Policy Analysis

Alternate Edition—Additional Chapters

Part Eight

Topics in Corporate Finance

21 International Corporate Finance

22 Risk Management: An Introduction to Financial Engineering

23 Options and Corporate Securities

24 Mergers and Acquisitions

25 Leasing

Appendix A Mathematical Tables

Appendix B Key Equations

Appendix C Answers to Selected End-of-Chapter Problems

Index

Provides a modern, up-to-date discussion of IPOs and the cost of going public

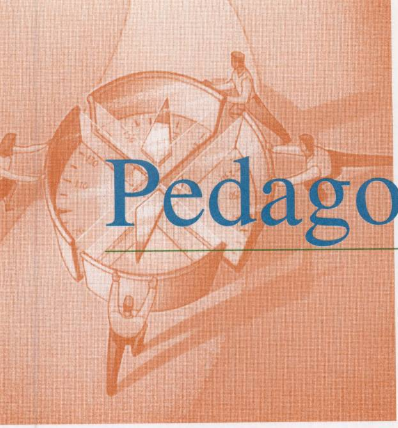
This chapter can be omitted without a loss in continuity

Presents a general survey of short-term financial management, which is useful when time does not permit a more in-depth treatment

Choose this edition if you are interested in covering the following additional topics!

Same chapter as in the Standard Edition

This increasingly important topic is presented at a level appropriate for an introductory class



Pedagogy to Guide You

IN ADDITION TO ILLUSTRATING pertinent concepts and presenting up-to-date coverage, *Fundamentals of Corporate Finance* strives to present the material in a way that makes it coherent and easy to understand. To meet the varied needs of the intended audience, *Fundamentals of Corporate Finance* is rich in valuable learning tools and support.

Chapter-Opening Vignettes These are from real-world events and introduce students to the chapter concepts. Questions about these vignettes are posed to the reader to ensure understanding of the concepts in the end-of-chapter material. Check out these engaging applications and their related questions. For examples, see **Chapter 5, pages 118 and 137; Chapter 6, pages 140 and 169; and Chapter 10, pages 278 and 311**

IN EARLY 1998, General Motors announced plans to launch the Cadillac Escalade, its first truck under the Cadillac brand name and its first luxury sport-utility vehicle (SUV). GM's decision was primarily a reaction to the runaway success of new luxury SUVs such as Ford's Lincoln Navigator and Mercedes-Benz's new M-class. These vehicles were exceptionally profitable; for example, each of the 18,500 Lincoln Navigators that sold in the four months after their introduction in June 1997 generated well over $10,000 in profit for Ford. GM had previously been unwilling to build a luxury SUV, but these profit margins were too large to ignore.

To answer the next three questions, refer back to the case of the Cadillac Escalade we discussed to open the chapter.

8. In evaluating the Escalade, under what circumstances might GM have concluded that erosion of the Denali line was irrelevant?
9. GM was not the only manufacturer looking at the big sport-utility category. Chrysler, however, initially decided *not* to go ahead with an entry (Chrysler later reversed course on this issue). Why might one company decide to proceed when another would not?
10. In evaluating the Escalade, what do you think GM needs to assume regarding the enormous profit margins that exist in this market? Is it likely they will be maintained when GM and others enter this market?

Pedagogical Use of Color This learning tool continues to be an important feature of *Fundamentals of Corporate Finance.* In almost every chapter, color plays an extensive, nonschematic, and largely self-evident role. A guide to the functional use of color is found on the endsheets of both the Annotated Instructor's Edition (AIE) and student version. For examples of this technique, see **Chapter 3, page 52; Chapter 9, page 264; and Chapter 12, page 370**

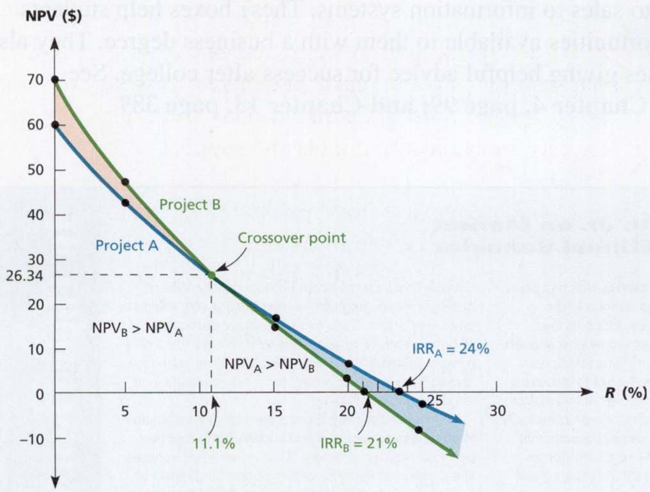


Figure 9.8
NPV profiles for mutually exclusive investments

To see why Investment A is not necessarily the better of the two investments, we've calculated the NPV of these investments for different required returns:

Discount Rate	NPV(A)	NPV(B)
0%	$60.00	$70.00
5	43.13	47.88
10	29.06	29.79
15	17.18	14.82
20	7.06	2.31
25	− 1.63	− 8.22

Enhanced! Real-World Examples These are integrated throughout the text tying chapter concepts to real life through illustration, reinforcing the relevance of the material. Some examples tie into the Chapter-Opening Vignette for added reinforcement. See **Chapter 2, page 28; Chapter 5, page 124; and Chapter 8, page 229**.

To give another example, H. Wayne Huizenga wants you to own a piece of the National Hockey League's Florida Panthers. If you buy a share of the Class A stock, you get the right to cast a vote, but that vote won't count for much. To make sure Huizenga doesn't violate NHL bylaws, which require league approval of any change in team control, Huizenga created 255,000 shares of another class of stock (Class B) just for himself. Each of those shares carries 10,000 votes.

In principle, the New York Stock Exchange does not allow companies to create classes of publicly traded common stock with unequal voting rights. Exceptions (e.g., Ford) appear to have been made. In addition, many non-NYSE companies have dual classes of common stock.

New! In Their Own Words Boxes This edition has two series of *In Their Own Words* boxes. The series in blue boxes are the popular articles updated from previous editions written by a distinguished scholar or practitioner on key topics in the text. Boxes include essays by Merton Miller on capital structure, Fischer Black on dividends, and Roger Ibbotson on capital market history. A complete list of "In Their Own Words" boxes appears on page xxxii.

The series in green boxes features recent college graduates with business degrees who are now important members of the workforce. Their jobs range from finance to marketing to sales to information systems. These boxes help students realize the career opportunities available to them with a business degree. They also feature recent graduates giving helpful advice for success after college. See Chapter 1, page 10; Chapter 4, page 99; and Chapter 13, page 389

In Their Own Words . . .

Clifford W. Smith Jr. on Market Incentives for Ethical Behavior

ETHICS IS A TOPIC that has been receiving increased interest in the business community. Much of this discussion has been led by philosophers and has focused on moral principles. Rather than review these issues, I want to discuss a complementary (but often ignored) set of issues from an economist's viewpoint. Markets impose potentially substantial costs on individuals and institutions that engage in unethical behavior. These market forces thus provide important incentives that foster ethical behavior in the business community.

At its core, economics is the study of making choices. I thus want to examine ethical behavior simply as one choice facing an individual. Economic analysis suggests that in considering an action, you identify its expected costs and benefits. If the estimated benefits exceed the estimated costs, you take the action; if not, you don't. To focus this discussion, let's consider the following specific choice: Suppose you have a contract to deliver a product of a doubt a firm's claims about product quality. Where quality is more uncertain, customers are only willing to pay lower prices. Such firms thus have particularly strong incentives to adopt financial policies that imply a lower probability of insolvency. Therefore such firms should have lower leverage, enter fewer leases, and engage in more hedging.

Third, the expected costs are higher if information about cheating is rapidly and widely distributed to potential future customers. Thus information services like *Consumer Reports*, which monitor and report on product quality, help deter cheating. By lowering the costs for potential customers to monitor quality, such services raise the expected costs of cheating.

Finally, the costs imposed on a firm that is caught cheating depend on the market's assessment of the ethical breach. Some actions viewed as clear transgressions by some might be viewed as justifiable behavior by others. Ethical standards also vary across markets. For example, a payment that if disclosed in the United States would be labeled a bribe might be

In Their Own Words . . .

Recipe for Success: Go Cross-Functional

FINANCE. The word in itself brings to mind images of frantic brokers on the floor of a stock exchange, people who speak in what seems like another language complete with alphabet soup acronyms such as LBO, IPO, LIBOR, and NASDAQ, and a profession that keeps the makers of pain relievers in business.

In much the same way that the image of the bean-counting, pencil-pushing accountant has gone the way of the dinosaur, so too has the misconception that the only opportunities available to finance majors are careers on Wall Street. In my case, finance has opened the door to a challenging career in corporate finance with General Mills, Inc.

After getting an initial look at General Mills through a summer internship, I felt very confident in the many challenges that lay ahead. At General Mills, the finance organization is rotationally based, giving each individual the opportunity to see the business from many different perspectives. In this dynamic environment, the company seeks to develop financial professionals that have a broad sense about the business as a whole, rather than their department in isolation. By developing this background, members of the finance organization of the coin, receiving a request from a product sales manager, or one of the representatives from a sales region or account, would not be considered outside of the realm of possibility. Finally, I also work closely with the other division trade analysts to examine issues common to all divisions.

My career in the finance organization has the potential to take me many different places. In adhering to their philosophy of well-rounded, business-minded financial professionals, my rotations could take me to a position within a marketing division, analyzing growth and directing the business according to clear financial goals, or possibly to an operations division such as purchasing or distribution, looking at generating productivity improvements and driving costs out of our production processes, or maybe within some of our corporate functions such as treasury operations, financial reporting, or mergers and acquisitions. The possibility also exists to take a more hands-on approach to the business and lead the financial group at one of our production facilities.

I can offer a few words of wisdom to those of you still making decisions about where you want your degree to take you. First, find a way to work on cross-functional projects within the business school, or even

New! Spreadsheet Strategies This feature either introduces students to Excel™ or helps them brush up on 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 examples, see **Chapter 5, page 134; Chapter 6, page 146; and Chapter 7, page 187.**

Spreadsheet Strategies

How to Calculate Present Values with Multiple Future Cash Flows Using a Spreadsheet

Just as we did in our previous chapter, we can set up a basic spreadsheet to calculate the present values of the individual cash flows as follows. Notice that we have simply calculated the present values one at a time and added them up:

	A	B	C	D	E
1					
2	Using a spreadsheet to value multiple future cash flows				
3					
4	What is the present value of $200 in one year, $400 the next year, $600 the next year, and				
5	$800 the last year if the discount rate is 12 percent?				
6					
7	Rate:	0.12			
8					
9	Year	Cash flows	Present values	Formula used	
10	1	$200	$178.57	=PV(B7,A10,0,−B10)	
11	2	$400	$318.88	=PV(B7,A11,0,−B11)	
12	3	$600	$427.07	=PV(B7,A12,0,−B12)	
13	4	$800	$508.41	=PV(B7,A13,0,−B13)	
14					
15		Total PV:	**$1,432.93**	=SUM(C10:C13)	
16					
17	Notice the negative signs inserted in the PV formulas. These just make the present values have				
18	positive signs. Also, the discount rate in cell b7 is entered as B7 (an "absolute" reference)				
19	because it is used over and over. We could have just entered ".12" instead, but our approach is more				
20	flexible.				
21					
22					

Concept Building Chapter sections are intentionally kept short to promote a step-by-step, building block approach to learning. Each section is then followed by a series of short concept questions that highlight the key ideas just presented. Students use these questions to make sure they can identify and understand the most important concepts as they read. See **Chapter 5, page 127; Chapter 8, page 232; and Chapter 12, page 371** for examples.

Concept Questions

8.2a What rights do stockholders have?

8.2b What is a proxy?

8.2c Why is preferred stock called preferred?

Summary Tables These tables succinctly restate key principles, results and equations. They appear whenever it is useful to emphasize and summarize a group of related concepts. For examples, see **Chapter 2, page 35; Chapter 6, page 155; and Chapter 7, page 186.**

Table 2.5

Cash flow summary

Trans. 2.7

I. The cash flow identity

Cash flow from assets = Cash flow to creditors (bondholders)
+ Cash flow to stockholders (owners)

II. Cash flow from assets

Cash flow from assets = Operating cash flow
− Net capital spending
− Change in net working capital (NWC)

where

Operating cash flow = Earnings before interest and taxes (EBIT)
+ Depreciation − Taxes

Net capital spending = Ending net fixed assets − Beginning net fixed assets
+ Depreciation

Change in NWC = Ending NWC − Beginning NWC

III. Cash flow to creditors (bondholders)

Cash flow to creditors = Interest paid − Net new borrowing

IV. Cash flow to stockholders (owners)

Cash flow to stockholders = Dividends paid − Net new equity raised

Labeled Examples Separate numbered and titled examples are extensively integrated into the chapters as indicated below. 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. Based on our classroom testing, these examples are among the most useful learning aids because they provide both detail and explanation. See **Chapter 2, page 30; Chapter 6, page 149; and Chapter 9, page 250.**

Example 2.4 **Deep in the Heart of Taxes**

Trans. 2.5
Marginal vs. Average
Corporate Tax Rates

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 × \$50,000 + .25 × 25,000 + .34 × (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.

Highlighted Concepts Throughout the text, important ideas are pulled out and presented in a green box—signaling to students that this material is particularly relevant and critical for their understanding. See **Chapter 7, page 205; Chapter 9, page 253; and Chapter 12, page 396**

Based on the discounted payback rule, an investment is acceptable if its discounted payback is less than some prespecified number of years.

Chapter Review and Self-Test Problems Appearing after the Summary and Conclusions, each chapter includes a Chapter Review and Self-Test Problem section. These questions and answers allow students to test their abilities in solving key problems related to the chapter content and provide instant reinforcement. See **Chapter 2, page 39; Chapter 7, page 343; and Chapter 14, page 439.**

Chapter Review and Self-Test Problem

2.1 Cash Flow for Mara Corporation This problem will give you some practice working with financial statements and figuring cash flow. Based on the following information for Mara Corporation, prepare an income statement for 1999 and balance sheets for 1998 and 1999. Next, following our U.S. Corporation examples in

Answer to Chapter Review and Self-Test Problem

2.1 In preparing the balance sheets, remember that shareholders' equity is the residual. With this in mind, Mara's balance sheets are as follows:

MARA CORPORATION
Balance sheets as of December 31, 1998 and 1999

	1998	1999		1998	1999
Current assets	$2,205	$ 2,429	Current liabilities	$1,003	$ 1,225
Net fixed assets	7,344	7,650	Long-term debt	3,106	2,085
			Equity	5,440	6,769
Total assets	$9,549	$10,079	Total liabilities and shareholders' equity	$9,549	$10,079

The income statement is straightforward:

Concepts Review and Critical Thinking Questions This successful end-of-chapter section introduced in the Fourth Edition facilitates students' knowledge of key principles, and their intuitive understanding of chapter concepts. A number of the questions relate to the Chapter-Opening Vignette—reinforcing student critical-thinking skills and the learning of chapter material. For examples, see **Chapter 3, page 79; Chapter 6, page 169; and Chapter 14, page 440.**

Concepts Review and Critical Thinking Questions

1. In evaluating an annuity present value, there are four pieces. What are they?
2. As you increase the length of time involved, what happens to the present value of an annuity? What happens to the future value?
3. What happens to the future value of an annuity if you increase the rate r? What happens to the present value?
4. What do you think about the Tri-State Megabucks lottery discussed in the chapter advertising a $500,000 prize when the lump-sum option is $250,000? Is it deceptive advertising?

End-of-Chapter Questions and Problems We have found that many students learn better when they have plenty of opportunity to practice; therefore, we provide extensive end-of-chapter questions and problems. The end-of-chapter support greatly exceeds what is typical in an introductory textbook. 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. Throughout the text, we have worked to supply interesting problems that illustrate real-world applications of chapter material. Answers to selected end-of-chapter material appear in Appendix C. See **Chapter 5, page 137; Chapter 6, page 170; and Chapter 15, page 482.**

Basic
(Questions 1–28)

@ 10%: PV = $2,699.95
@ 18%: PV = $2,251.68
@ 24%: PV = $1,990.57

Questions and Problems

1. **Present Value and Multiple Cash Flows** Stellato Shaved Ice Co. has identified an investment project with the following cash flows. If the discount rate is 10 percent, what is the present value of these cash flows? What is the present value at 18 percent? At 24 percent?

Intermediate
(Questions 29–59)
6.05%

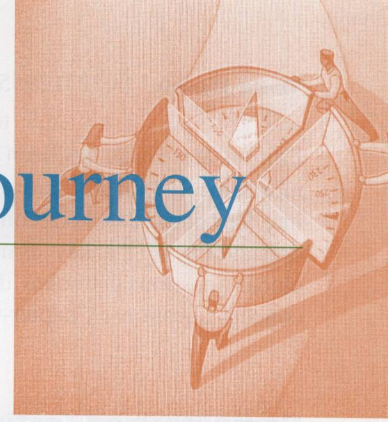
29. **Simple Interest versus Compound Interest** First Simple Bank pays 8 percent simple interest on its investment accounts. If First Complex Bank pays interest on its accounts compounded annually, what rate should the bank set if it wants to match First Simple Bank over an investment horizon of 10 years?

Third year: $800.00
Life of loan: $4,800.00

Challenge
(Questions 60–75)

EAR = 13.64%

60. **Discount Interest Loans** This question illustrates what is known as *discount interest.* Imagine you are discussing a loan with a somewhat unscrupulous lender. You want to borrow $12,000 for one year. The interest rate is 12 percent. You and the lender agree that the interest on the loan will be .12 × $12,000 = $1,440. So the lender deducts this interest amount from the loan up front and gives you $10,560. In this case, we say that the discount is $1,440. What's wrong here?



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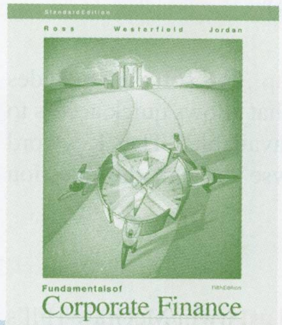

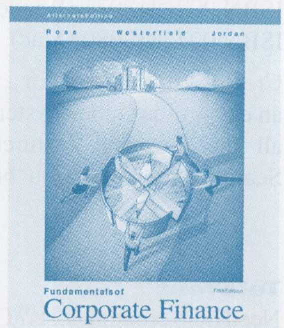

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