ROSS
WESTERFIELD
JORDAN

Essentials of
CORPORATE FINANCE

FIFTH EDITION

Essentials of
CORPORATE FINANCE

FIFTH EDITION

Stephen A. Ross
Massachusetts Institute of Technology

Randolph W. Westerfield
University of Southern California

Bradford D. Jordan
University of Kentucky

McGraw-Hill Irwin

Boston Burr Ridge, IL Dubuque, IA Madison, WI New York San Francisco St. Louis
Bangkok Bogotá Caracas Kuala Lumpur Lisbon London Madrid Mexico City
Milan Montreal New Delhi Santiago Seoul Singapore Sydney Taipei Toronto

McGraw-Hill Irwin

ESSENTIALS OF CORPORATE FINANCE
Published by McGraw-Hill/Irwin, a business unit of The McGraw-Hill Companies, Inc., 1221 Avenue of the Americas, New York, NY, 10020.

Some ancillaries, including electronic and print components, may not be available to customers outside the United States.

This book is printed on acid-free paper.

Printed in China

2 3 4 5 6 7 8 9 0 SDB/SDB 0 9 8 7 6

ISBN-13 978-0-07-294673-4
ISBN-10 0-07-294673-3 (student edition)
ISBN-13 978-0-07-321455-9
ISBN-10 0-07-321455-8 (annotated instructor's edition)

Publisher: *Stephen M. Patterson*
Sponsoring editor: *Michele Janicek*
Developmental editor II: *Jennifer V. Rizzi*
Marketing manager: *Julie Phifer*
Media producer: *Jennifer Fisher*
Lead project manager: *Christine A. Vaughan*
Production supervisor: *Gina Hangos*
Senior designer: *Kami Carter*
Lead media project manager: *Becky Szura*
Senior supplement producer: *Carol Loreth*
Developer, Media technology: *Brian Nacik*
Cover and interior image: © *Eric Mueller Illustration*
Typeface: *10/12 Times Roman*
Compositor: *Interactive Composition Corporation*
Printer: *Shenzhen Donnelley Printing Co., Ltd.*

Library of Congress Cataloging-in-Publication Data

Ross, Stephen A.
Essentials of corporate finance / Stephen A. Ross, Randolph W. Westerfield, Bradford D. Jordan.—5th ed.
p. cm.—(The McGraw-Hill/Irwin series in finance, insurance, and real estate)
Includes index.
ISBN-13: 978-0-07-294673-4
ISBN-10: 0-07-294673-3 (student ed. : alk. paper)
ISBN-13: 978-0-07-321455-9
ISBN-10: 0-07-321455-8 (annotated instructor's ed. : alk. paper)
1. Corporations—Finance. I. Westerfield, Randolph. II. Jordan, Bradford D. III. Title. IV. Series.

HG4026.R676 2007
658.15—dc22 2005050532

www.mhhe.com

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

Consulting Editor, Stephen A. Ross
Franco Modigliani Professor of Finance and Economics
Sloan School of Management, Massachusetts Institute of Technology

FINANCIAL MANAGEMENT

Adair
Excel Applications for Corporate Finance, 1/e

Benninga and Sarig
Corporate Finance: A Valuation Approach

Block and Hirt
Foundations of Financial Management, 11/e

Brealey, Myers, and Allen
Principles of Corporate Finance, 8/e

Brealey, Myers, and Marcus
Fundamentals of Corporate Finance, 5/e

Brooks
FinGame Online 4.0

Bruner
Case Studies in Finance: Managing for Corporate Value Creation, 5/e

Chew
The New Corporate Finance: Where Theory Meets Practice, 3/e

Chew and Gillan
Corporate Governance at the Crossroads: A Book of Readings, 1/e

DeMello
Cases in Finance, 2/e

Grinblatt and Titman
Financial Markets and Corporate Strategy, 2/e

Helfert
Techniques of Financial Analysis: A Guide to Value Creation, 11/e

Higgins
Analysis for Financial Management, 8/e

Kester, Ruback, and Tufano
Case Problems in Finance, 12/e

Ross, Westerfield, and Jaffe
Corporate Finance, 7/e

Ross, Westerfield, Jaffe, and Jordan
Corporate Finance: Core Principles and Applications, 1/e

Ross, Westerfield, and Jordan
Essentials of Corporate Finance, 5/e

Ross,Westerfield, and Jordan
Fundamentals of Corporate Finance, 7/e

Shefrin
Behavioral Corporate Finance: Decisions That Create Value, 1/e

Smith
The Modern Theory of Corporate Finance, 2/e

White
Financial Analysis with an Electronic Calculator, 6/e

INVESTMENTS

Bodie, Kane, and Marcus
Essentials of Investments, 6/e

Bodie, Kane, and Marcus
Investments, 6/e

Cohen, Zinbarg, and Zeikel
Investment Analysis and Portfolio Management, 5/e

Corrado and Jordan
Fundamentals of Investments: Valuation and Management, 3/e

Hirt and Block
Fundamentals of Investment Management, 8/e

FINANCIAL INSTITUTIONS AND MARKETS

Cornett and Saunders
Fundamentals of Financial Institutions Management

Rose and Hudgins
Bank Management and Financial Services, 6/e

Rose and Marquis
Money and Capital Markets: Financial Institutions and Instruments in a Global Marketplace, 9/e

Santomero and Babbel
Financial Markets, Instruments, and Institutions, 2/e

Saunders and Cornett
Financial Institutions Management: A Risk Management Approach, 5/e

Saunders and Cornett
Financial Markets and Institutions: An Introduction to the Risk Management Approach, 3/e

INTERNATIONAL FINANCE

Beim and Calomiris
Emerging Financial Markets

Eun and Resnick
International Financial Management, 4/e

Kuemmerle
Case Studies in International Entrepreneurship: Managing and Financing Ventures in the Global Economy, 1/e

Levich
International Financial Markets: Prices and Policies, 2/e

REAL ESTATE

Brueggeman and Fisher
Real Estate Finance and Investments, 12/e

Corgel, Ling, and Smith
Real Estate Perspectives: An Introduction to Real Estate, 4/e

Ling and Archer
Real Estate Principles: A Value Approach, 1/e

FINANCIAL PLANNING AND INSURANCE

Allen, Melone, Rosenbloom, and Mahoney
Pension Planning: Pension, Profit-Sharing, and Other Deferred Compensation Plans, 9/e

Altfest
Personal Financial Planning, 1/e

Crawford
Life and Health Insurance Law, 8/e (LOMA)

Harrington and Niehaus
Risk Management and Insurance, 2/e

Hirsch
Casualty Claim Practice, 6/e

Kapoor, Dlabay, and Hughes
Focus on Personal Finance: An Active Approach to Help You Develop Successful Financial Skills, 1/e

Kapoor, Dlabay, and Hughes
Personal Finance, 8/e

About the Authors

Stephen A. Ross
Sloan School of Management, Franco Modigliani Professor of Finance and Economics, Massachusetts Institute of Technology

Stephen A. Ross is 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 and of Freddie Mac.

Randolph W. Westerfield
Marshall School of Business, University of Southern California

Randolph W. Westerfield is Dean Emeritus of the University of Southern California's Marshall School of Business and is 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 a member of the finance faculty for 20 years. He is a member of several public company boards of directors including Health Management Associates, Inc., William Lyons Homes, and the Nicholas Applegate Growth Fund. His areas of expertise include corporate financial policy, investment management, and stock market price behavior.

Bradford D. Jordan
Gatton College of Business and Economics, Professor of Finance and holder of the Richard W. and Janis H. Furst Endowed Chair in Finance, University of Kentucky

Bradford D. Jordan is Professor of Finance and holder of the Richard W. and Janis H. Furst Endowed Chair in Finance 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 the cost of capital, capital structure, and the behavior of security prices. He is a past president of the Southern Finance Association, and he is coauthor (with Charles J. Corrado) of *Fundamentals of Investments: Valuation and Management,* 3rd edition, a leading investments text, also published by McGraw-Hill/Irwin.

From the Authors

When we first wrote *Essentials of Corporate Finance,* we thought there might be a small niche for a briefer book that really focused on what students with widely varying backgrounds and interests needed to carry away from an introductory finance course. We were wrong. There was a huge niche! What we learned is that our text closely matches the needs of instructors and faculty at hundreds of schools across the country. As a result, the growth we have experienced through the first four editions of *Essentials* has far exceeded anything we thought possible.

With the fifth edition of *Essentials of Corporate Finance,* we have continued to refine our focus on our target audience, which is the undergraduate student taking a core course in business or corporate finance. This can be a tough course to teach. One reason is that the class is usually required of all business students, so it is not uncommon for a majority of the students to be nonfinance majors. In fact, this may be the only finance course many of them will ever have. With this in mind, our goal in *Essentials* is to convey the most important concepts and principles at a level that is approachable for the widest possible audience.

To achieve our goal, we have worked to distill the subject down to its bare essentials (hence, the name of this book), while retaining a decidedly modern approach to finance. We have always maintained that the subject of corporate finance can be viewed as the working of a few very powerful intuitions. We also think that understanding the "why" is just as important, if not more so, than understanding the "how," especially in an introductory course. Based on the gratifying market feedback we have received from our first four editions, as well as from our other text, *Fundamentals of Corporate Finance* (now in its 7th edition), many of you agree.

By design, this book is not encyclopedic. As the table of contents indicates, we have a total of 18 chapters. Chapter length is about 30 pages, so the text is aimed squarely at a single-term course, and most of the book can be realistically covered in a typical semester or quarter. Writing a book for a one-term course necessarily means some picking and choosing, with regard to both topics and depth of coverage. Throughout, we strike a balance by introducing and covering the essentials (there's that word again!) while leaving some more specialized topics to follow-up courses.

The other things we have always stressed, and have continued to improve with this edition, are readability and pedagogy. *Essentials* is written in a relaxed, conversational style that invites the students to join in the learning process rather than being a passive information absorber. We have found that this approach dramatically increases students' willingness to read and learn on their own. Between larger and larger class sizes and the ever-growing demands on faculty time, we think this is an essential (!) feature for a text in an introductory course.

Throughout the development of this book, we have 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.

As a result of this process, three basic themes emerge as our central focus in writing *Essentials of Corporate Finance:*

An Emphasis on Intuition We always try to separate and explain the principles at work on a commonsense, 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.

Today, as we prepare to once again enter the market, our goal is to stick with and build on the 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 and 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

Organization of the Text

We designed *Essentials of Corporate Finance* to be as flexible and modular as possible. There are a total of nine parts, and, in broad terms, the instructor is free to decide the particular sequence. Further, within each part, the first chapter generally contains an overview and survey. Thus, when time is limited, subsequent chapters can be omitted. Finally, the sections placed early in each chapter are generally the most important, and later sections frequently can be omitted without loss of continuity. For these reasons, the instructor has great control over the topics covered, the sequence in which they are covered, and the depth of coverage.

Just to get an idea of the breadth of coverage in the fifth edition of *Essentials,* the following grid presents for each chapter some of the most significant new features as well as a few selected chapter highlights. Of course, in every chapter, opening vignettes, boxed features, in-chapter illustrations and examples using real companies, and end-of-chapter material have been thoroughly updated as well.

Chapters	Selected Topics of Interest	Benefits to Users
PART ONE	**Overview of Financial Management**	
Chapter 1	*New material:* Sarbanes-Oxley regulations.	Discusses "Sarbox" and its costs and implications for corporate managers.
	Goal of the firm and agency problems.	Stresses value creation as the most fundamental aspect of management and describes agency issues that can arise.
	Ethics, financial management, and executive compensation.	Brings in real-world issues concerning conflicts of interest and current controversies surrounding ethical conduct and management pay.
PART TWO	**Understanding Financial Statements and Cash Flow**	
	New mini-case: Cash Flows and Financial Statements at Sunset Boards, Inc.	New case written for this edition reinforces key cash flow concepts in a small-business setting.
	New mini-case: Ratios and Financial Planning at S&S Air, Inc.	New case written for this edition illustrates the importance of financial planning in a small firm.
Chapter 2	Cash flow vs. earnings.	Clearly defines cash flow and spells out the differences between cash flow and earnings.
	Market values vs. book values.	Emphasizes the relevance of market values over book values.

Chapters	Selected Topics of Interest	Benefits to Users
Chapter 3	*New section:* Expanded Du Pont analysis.	New section expands the basic Du Pont equation to better explore the interrelationships between operating and financial performance.
	New material: Du Pont analysis for real companies using data from S&P *Market Insight.*	New analysis shows students how to get and use real-world data, thereby applying key chapter ideas.
	New material: Explanation of alternative formulas for sustainable and internal growth rates.	Explanation of growth rate formulas clears up a common misunderstanding about these formulas and the circumstances under which alternative formulas are correct.
	Ratio and financial statement analysis using smaller firm data.	Uses firm data from *RMA* to show students how to actually get and evaluate financial statements benchmarks.
PART THREE	**Valuation of Future Cash Flows**	
	New mini-case: S&S Air's Mortgage.	New case written for this edition shows how to evaluate different mortgage financing possibilities.
Chapter 4	First of two chapters on time value of money.	Relatively short chapter introduces just the basic ideas on time value of money to get students started on this traditionally difficult topic.
Chapter 5	Second of two chapters on time value of money.	Covers more advance time value topics with numerous examples, calculator tips, and Excel spreadsheet exhibits. Contains many real-world examples.
PART FOUR	**Valuing Stocks and Bonds**	
	New mini-case: Financing S&S Air's Expansion Plans with a Bond Issue.	New case written for this edition examines the debt issuance process for a small firm.
Chapter 6	*New material:* "Clean" vs. "dirty" bond prices and accrued interest.	Clears up the pricing of bonds between coupon payment dates and also bond market quoting conventions.
	New material: NASD's new TRACE system and transparency in the corporate bond market.	Up-to-date discussion of new developments in fixed income with regard to price, volume, and transactions reporting.
	New material: "Make-whole" call provisions.	Up-to-date discussion of relatively new type of call provision that has become very common.
Chapter 7	Stock valuation.	Thorough coverage of constant and nonconstant growth models.
	NYSE and NASDAQ market operations.	Up-to-date description of major stock market operations.
PART FIVE	**Capital Budgeting**	
	New mini-case: Conch Republic Electronics.	New case written for this edition analyzes capital budgeting issues and complexities.
Chapter 8	First of two chapters on capital budgeting.	Relatively short chapter introduces key ideas on an intuitive level to help students with this traditionally difficult topic.
	NPV, IRR, payback, discounted payback, accounting rate of return.	Consistent, balanced examination of advantages and disadvantages of various criteria.
Chapter 9	Project cash flow.	Thorough coverage of project cash flows and the relevant numbers for a project analysis.
	Scenario and sensitivity "what-if" analysis.	Illustrates how to actually apply and interpret these tools in a project analysis.

Chapters	Selected Topics of Interest	Benefits to Users
PART SIX Risk and Return		
	New mini-case: A Job at S&S Air.	New case written for this edition explores 401(k)–type retirement investing.
Chapter 10	*New section:* Geometric vs. arithmetic returns.	Discusses calculation and interpretation of geometric returns. Clarifies common misconceptions regarding appropriate use of arithmetic versus geometric average returns.
	Capital market history.	Extensive coverage of historical returns, volatilities, and risk premiums.
	Market efficiency.	Efficient markets hypothesis discussed along with common misconceptions.
Chapter 11	Diversification, systematic, and unsystematic risk.	Illustrates basics of risk and return in a straightforward fashion.
	Beta and the security market line.	Develops the security market line with an intuitive approach that bypasses much of the usual portfolio theory and statistics.
PART SEVEN Long-Term Financing		
	New mini-case: Cost of Capital for Hubbard Computer, Inc.	New case written for this edition examines cost of capital for a smaller, nonpublic company.
Chapter 12	*New discussion:* Geometric vs. arithmetic growth rates.	Both approaches are used in practice. Clears up issues surrounding growth rate estimates.
	Cost of capital estimation.	Contains a complete Web-based illustration of cost of capital for a real company.
Chapter 13	Basics of financial leverage.	Illustrates effect of leverage on risk and return.
	Optimal capital structure.	Describes the basic trade-offs leading to an optimal capital structure.
	Financial distress and bankruptcy.	Briefly surveys the bankruptcy process.
Chapter 14	*New material:* Very recent survey evidence on dividend policy.	New survey results show the most important (and least important) factors considered by financial managers in setting dividend policy.
	New material: Effect of new tax laws.	Discusses implications of new, lower dividend and capital gains rates.
	Dividends and dividend policy.	Describes dividend payments and the factors favoring higher and lower payout policies.
Chapter 15	*New discussion:* Dutch auction IPOs.	Explains uniform price auctions using recent Google IPO as an example.
	New discussion: IPO "quiet periods."	Explains the SEC's quiet period rules.
	IPO valuation.	Extensive, up-to-date discussion of IPOs, including the 1999–2000 period.
PART EIGHT Short-Term Financial Management		
	New mini-case: Piepkorn Manufacturing Working Capital Management.	New case written for this edition evaluates working capital issues for a small firm.
Chapter 16	Operating and cash cycles.	Stresses the importance of cash flow timing.
	Short-term financial planning.	Illustrates creation of cash budgets and potential need for financing.

Chapters	Selected Topics of Interest	Benefits to Users
Chapter 17	Cash collection and disbursement.	Examination of systems used by firms to handle cash inflows and outflows.
	Credit management.	Analysis of credit policy and implementation.
	Inventory management.	Brief overview of important inventory concepts.
PART NINE	**Topics in Business Finance**	
	New mini-case: S&S Air Goes International.	New case written for this edition evaluates an international expansion for a small firm.
Chapter 18	Foreign exchange.	Covers essentials of exchange rates and their determination.
	International capital budgeting.	Shows how to adapt basic DCF approach to handle exchange rates.
	Exchange rate and political risk.	Discusses hedging and issues surrounding sovereign risk.

Learning Solutions

In addition to illustrating relevant concepts and presenting up-to-date coverage, *Essentials 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, *Essentials of Corporate Finance* is rich in valuable learning tools and support.

Each feature can be categorized by the benefit to the student:

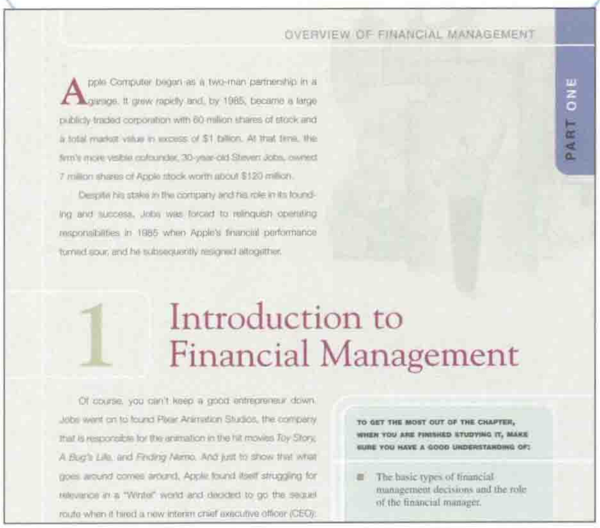
- Real Financial Decisions
- Application Tools
- Study Aids

REAL FINANCIAL DECISIONS

We have included two key features that help students connect chapter concepts to how decision makers use this material in the real world.

Chapter-Opening Vignettes with Functional Integration Links

Each chapter begins with a recent real-world event to introduce students to chapter concepts. Since many nonfinance majors will use this text, a brief paragraph linking the vignette and chapter concepts to majors in marketing, management, and accounting is included.



OVERVIEW OF FINANCIAL MANAGEMENT

PART ONE

Apple Computer began as a two-man partnership in a garage. It grew rapidly and, by 1985, became a large publicly traded corporation with 60 million shares of stock and a total market value in excess of $1 billion. At that time, the firm's more visible cofounder, 30-year-old Steven Jobs, owned 7 million shares of Apple stock worth about $120 million.

Despite his stake in the company and his role in its founding and success, Jobs was forced to relinquish operating responsibilities in 1985 when Apple's financial performance turned sour, and he subsequently resigned altogether.

1 Introduction to Financial Management

Of course, you can't keep a good entrepreneur down. Jobs went on to found Pixar Animation Studios, the company that is responsible for the animation in the hit movies *Toy Story*, *A Bug's Life*, and *Finding Nemo*. And just to show that what goes around comes around, Apple found itself struggling for relevance in a "Wintel" world and decided to go the sequel route when it hired a new interim chief executive officer (CEO):

TO GET THE MOST OUT OF THE CHAPTER, WHEN YOU ARE FINISHED STUDYING IT, MAKE SURE YOU HAVE A GOOD UNDERSTANDING OF:

- The basic types of financial management decisions and the role of the financial manager.

REALITY BYTES

Corporate Ethics

Large companies are sometimes guilty of unethical behavior. Often this unethical behavior takes the form of false or misleading financial statements. In one of the largest corporate fraud cases in history, energy giant Enron Corporation was forced to file for bankruptcy in December 2001 amid allegations that the company's financial statements were deliberately misleading and false. Enron's bankruptcy not only destroyed that company, but its auditor Arthur Andersen as well.

Of course, ethical problems are not confined to the United States. For example, in late 2003 the Italian dairy firm Parmalat SpA announced it had liquidity problems. What followed was an investigation into the largest corporate fraud scandal in European history. At one point, the company was forced to disclose that it did not actually have a $4.8 billion bank account it had claimed on its financial statements.

The difference between ethical and unethical behavior can sometimes be murky. For example, many U.S. companies have relocated to Bermuda for reasons beyond the beautiful pink beaches; namely, Bermuda has no corporate income taxes. With a population of less than 65,000, the island is home to more than 13,000 international companies. Stanley Works, the well-known maker of Stanley tools, was among the U.S. corporations that chose to move to the island paradise. By doing so, Stanley estimated that it would save $30 million per year in taxes. Since the goal of the corporation is to maximize shareholder wealth, this would seem like a good move, and the practice is entirely legal. But is it ethical? What are the issues?

Another recent corporate activity that has generated much controversy is the practice of outsourcing, or offshoring, jobs to other countries. U.S. corporations engage in this practice when labor costs in another country are substantially lower than they are domestically. Again, this is done to maximize shareholder wealth. But the ethical dilemma in this case is even trickier. Some U.S. workers do lose jobs when offshoring occurs. On the other hand, the Milken Institute estimated that every $1 spent on offshoring a service job to India generated a net value to the United States of $1.13, along with another $.33 to India. And it gets even more complicated. What about foreign companies such as BMW and Toyota who "insource" jobs by building plants in the United States? Is it unethical to outsource U.S. jobs while, at the same time, insourcing jobs from other countries?

Reality Bytes Boxes

Most chapters include at least one *Reality Bytes* box, which takes a chapter issue and shows how it is being used right now in everyday financial decision making.

APPLICATION TOOLS

Realizing that there is more than one way to solve problems in corporate finance, we include many sections that will not only encourage students to learn different problem-solving methods, but that will also help them learn or brush up on their financial calculator and Excel spreadsheet skills.

Mini-cases

Located after most of the parts, these mini-cases focus on hypothetical company situations that embody 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 from the chapters in that part. Great for homework or in-class exercises and discussions!

CASH FLOWS AND FINANCIAL STATEMENTS AT SUNSET BOARDS, INC.

MINI-CASE 1 / PART TWO

Sunset Boards, Inc., is a small company that manufactures and sells surfboards in Malibu. Tad Marks, the founder of the company, is in charge of the design and sale of the surfboards, but his background is in surfing, not business. As a result, the company's financial records are not maintained well.

The initial investment in Sunset Boards was provided by Tad and his friends and family. Since the initial investment was relatively small, and the company has only made surfboards for its own store, the investors haven't required detailed financial statements from Tad. However, thanks to word of mouth among professional surfers, sales have picked up recently, and Tad is considering a major expansion. His plans include opening another surfboard store in Hawaii, as well as supplying his "sticks" (surfer lingo for boards) to other retailers.

Tad's expansion plans require a significant investment, which he plans to finance with a combination of additional funds from outside investors and money borrowed from banks. Naturally the new investors and creditors will require more organized and detailed financial statements than Tad has previously prepared. At the urging of his investors, Tad has hired financial analyst Paula Wolf to evaluate the performance of the company over the past year.

After rooting through old bank statements, sales receipts, tax returns, and other records, Paula has assembled the following information:

	2005	2006
Cost of goods sold	$118,034	$149,030
Cash	17,031	25,732
Depreciation	33,320	37,680
Interest expense	7,252	8,302
Selling & administrative expenses	23,212	30,296
Accounts payable	30,100	34,090

Work the Web

These boxes in the chapter material show students how to research financial issues using the Web and how to use the information they find to make business decisions.

WORK THE WEB

As we discussed in this chapter, ratios are an important tool for examining a company's performance. Gathering the necessary financial statements can be tedious and time consuming. Fortunately, many sites on the Web provide this information for free. One of the best is www.marketguide.com. We went there, entered a ticker symbol "GAP" (for The Gap), and then selected the "Ratio Comparison" link. Here is an abbreviated look at the results:

GAP INC (NYS)

LAST	CHANGE
21.11	▼ -0.14 (-0.66%) 4:01 PM ET

SECTOR: Services | INDUSTRY: Retail (Apparel)

Financial Strength

Financial Strength	Company	Industry	Sector	S&P 500
Quick Ratio (MRQ)	1.13	1.05	0.90	1.31
Current Ratio (MRQ)	2.80	2.49	1.45	1.81
LT Debt to Equity (MRQ)	0.36	0.23	0.73	0.63
Total Debt to Equity (MRQ)	0.36	0.25	0.86	0.80
Interest Coverage (TTM)	10.79	22.48	8.63	12.73

Most of the information is self-explanatory. The interest coverage ratio is the same as the times interest earned ratio discussed in the text. The abbreviation MRQ refers to results from the most recent quarterly financial statements, and TTM refers to results from the previous ("trailing") 12 months. Here's a question for you about The Gap: What does it imply when the long-term debt-equity and total debt-equity ratios are the same? The site also provides a comparison to the industry, business sector, and S&P 500 average for the ratios. Other ratios are available on the site and some have five-year averages calculated. Have a look!

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.

Dividend Payout and Earnings Retention

As we have seen in various places, a firm's net income gets divided into two pieces. The first piece is cash dividends paid to stockholders. Whatever is left over is the addition to retained earnings. For example, from Table 3.3, Prufrock's net income was $363, of which $121 was paid out in dividends. If we express dividends paid as a percentage of net income, the result is the *dividend payout ratio:*

Dividend payout ratio = Cash dividends/Net income
= $121/$363 [3.21]
= 33⅓%

What this tells us is that Prufrock pays out one-third of its net income in dividends.

Anything Prufrock does not pay out in the form of dividends must be retained in the

You can find growth rates under the research links at **www.multexinvestor.com** and **finance.yahoo.com**.

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.

WHAT'S ON THE WEB?

3.1 Du Pont Identity. You can find financial statements for Walt Disney Company on the "Investor Relations" link at Disney's home page, www.disney.com. For the three most recent years, calculate the Du Pont identity for Disney. How has ROE changed over this period? How have changes in each component of the Du Pont identity affected ROE over this period?

3.2 Ratio Analysis. You want to examine the financial ratios for Dell Computer Corporation. Go to www.marketguide.com and type in the ticker symbol for the company (DELL). Next, go to the ratio link. You should find financial ratios for Dell and the industry, sector, and S&P 500 averages for each ratio.

a. What do TTM and MRQ mean?

b. How do Dell's recent profitability ratios compare to their values over the past five years? To the industry averages? To the sector averages? To the S&P 500 averages? Which is the better comparison group for Dell: the industry, sector, or S&P 500 averages? Why?

c. In what areas does Dell seem to outperform its competitors based on the financial ratios? Where does Dell seem to lag behind its competitors?

d. Dell's inventory turnover ratio is much larger than that for all comparison groups. Why do you think this is?

3.3 Standardized Financial Statements. Go to the "Investors Relations" link for AT&T located at www.att.com, follow the "Annual Reports & SEC filings" link,

CALCULATOR HINTS

Using a Financial Calculator

Although there are the various ways of calculating future values we have described so far, many of you will decide that a financial calculator is the way to go. If you are planning on using one, you should read this extended hint; otherwise, skip it.

A financial calculator is simply an ordinary calculator with a few extra features. In particular, it knows some of the most commonly used financial formulas, so it can directly compute things like future values.

Financial calculators have the advantage that they handle a lot of the computation, but that is really all. In other words, you still have to understand the problem; the calculator just does some of the arithmetic. In fact, there is an old joke (somewhat modified) that goes like this: Anyone can make a mistake on a time value of money problem, but to really screw one up takes a financial calculator! We therefore have two goals for this section. First, we'll discuss how to compute future values. After that, we'll show you how to avoid the most common mistakes people make when they start using financial calculators.

How to Calculate Future Values with a Financial Calculator Examining a typical financial calculator, you will find five keys of particular interest. They usually look like this:

N **I/Y** **PMT** **PV** **FV**

For now, we need to focus on four of these. The keys labeled **PV** and **FV** are just what you would guess: present value and future value. The key labeled **N** refers to the number of periods, which is what we have been calling *t*. Finally, **I/Y** stands for the interest rate, which we have called *r*.

If we have the financial calculator set up right (see our next section), then calculating a future value is very simple. Take a look back at our question involving the future value of $100 at 10 percent for five years. We have seen that the answer is $161.05. The exact keystrokes will differ depending on what type of calculator you use, but here is basically all you do:

Calculator Hints

Calculator Hints is a self-contained section occurring in various chapters that first introduces students to calculator basics, and then illustrates how to solve problems with the calculator. Appendix D goes into more detailed instructions by solving problems with two specific calculators.

Spreadsheet Strategies

The unique Spreadsheet Strategies feature is also in a self-contained section, showing students how to set up spreadsheets to solve problems—a vital part of every business student's education.

SPREADSHEET STRATEGIES

Using a Spreadsheet for Time Value of Money Calculations

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

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

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

Learn more about using Excel for time value and other calculations at **www.studyfinance.com**.

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

3. Calculating Present Values. For each of the following, compute the present value:

Present Value	Years	Interest Rate	Future Value
	9	4%	$ 15,451
	4	12	51,557
	16	22	886,073
	21	20	550,164

4. Calculating Interest Rates. Solve for the unknown interest rate in each of the following:

Present Value	Years	Interest Rate	Future Value
$ 221	5		$ 307
425	7		761
25,000	18		136,771
40,200	16		255,810

5. Calculating the Number of Periods. Solve for the unknown number of years in each of the following:

Spreadsheet Templates

Indicated by an Excel icon next to applicable end-of-chapter Questions and Problems, spreadsheet templates are available for selected problems on the Student Edition of the book's Web site, www.mhhe.com/rwj. These Excel templates are a valuable extension of the Spreadsheet Strategies feature.

STUDY AIDS

We want students to get the most from this book and their course, and we realize that students have different learning styles and study needs. We therefore present a number of study features to appeal to a wide range of students.

Learning Objectives

Each chapter begins with a number of learning objectives that are key to the student's understanding of the chapter.

The Time Value of Money

THERE ARE THREE ESSENTIAL THINGS YOU SHOULD LEARN FROM THIS CHAPTER:

- How to determine the future value of an investment made today.
- How to determine the present value of cash to be received at a future date.
- How to find the return on an investment.

Is giving up $500 in exchange for $10,000 in 30 years a good deal? On the plus side, you get back $20 for every $1 you put up. That probably sounds good, but, on the downside, you have to wait 30 years to get it. What you need to know is how to analyze this trade-off; this chapter gives you the tools you need.

Specifically, our goal here is to introduce you to one of the most important principles in finance, the time value of money. What you will learn is how to determine the value today of some cash flow to be received later. This is a very basic business skill, and it underlies the analysis of many different types of investments and financing arrangements. In fact, almost all

Pedagogical Use of Color

We continue to use a full color palette in *Essentials* not only to make the text more inviting, but, more importantly, as a functional element to help students follow the discussion. In almost every chapter, color plays an important, largely self-evident role. A guide to the use of color is found on the back endsheets.

Year	Beginning Amount	Interest Earned	Ending Amount
1	$100.00	$10.00	$110.00
2	110.00	11.00	121.00
3	121.00	12.10	133.10
4	133.10	13.31	146.41
5	146.41	14.64	161.05
		Total interest $61.05	

TABLE 4.1

Future value of $100 at 10 percent

In our example, what would your $100 be worth after five years? We can first compute the relevant future value factor as:

$$(1 + r)^t = (1 + .10)^5 = 1.1^5 = 1.6105$$

Your $100 will thus grow to:

$$\$100 \times 1.6105 = \$161.05$$

The growth of your $100 each year is illustrated in Table 4.1. As shown, the interest earned in each year is equal to the beginning amount multiplied by the interest rate of 10 percent.

Critical Thinking Questions

Every chapter ends with a set of critical thinking questions that challenge the students to apply the concepts they have learned in the chapter to new situations.

CHAPTER 4 Introduction to Valuation: The Time Value of Money 111

CRITICAL THINKING AND CONCEPTS REVIEW

4.1 **Compounding.** What is compounding? What is discounting?

4.2 **Compounding and Periods.** As you increase the length of time involved, what happens to future values? What happens to present values?

4.3 **Compounding and Interest Rates.** What happens to a future value if you increase the rate r? What happens to a present value?

4.4 **Future Values.** Suppose you deposit a large sum in an account that earns a low interest rate and simultaneously deposit a small sum in an account with a high interest rate. Which account will have the larger future value?

4.5 **Ethical Considerations.** Take a look back at Example 4.6. Is it deceptive advertising? Is it unethical to advertise a future value like this without a disclaimer?

To answer the next five questions, refer to the GMAC security we discussed to open the chapter.

4.6 **Time Value of Money.** Why would GMAC be willing to accept such a small amount today ($500) in exchange for a promise to repay 20 times that amount ($10,000) in the future?

www.mhh

Concept Questions

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.

98 PART 3 Valuation of Future Cash Flows

CONCEPT QUESTIONS

4.1a What do we mean by the future value of an investment?

4.1b What does it mean to compound interest? How does compound interest differ from simple interest?

4.1c In general, what is the future value of $1 invested at r per period for t periods?

4.2 | PRESENT VALUE AND DISCOUNTING

When we discuss future value, we are thinking of questions such as the following: What will my $2,000 investment grow to if it earns a 6.5 percent return every year for the next six years? The answer to this question is what we call the future value of $2,000 invested at 6.5 percent for six years (verify that the answer is about $2,918).

Numbered 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 that 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.

net working capital Current assets less current liabilities.

As shown in Figure 2.1, the difference between a firm's current assets and its current liabilities is called **net working capital**. Net working capital is positive when current assets exceed current liabilities. Based on the definitions of current assets and current liabilities, this means that the cash that will become available over the next 12 months exceeds the cash that must be paid over that same period. For this reason, net working capital is usually positive in a healthy firm.

EXAMPLE 2.1 **Building the Balance Sheet**

A firm has current assets of $100, net fixed assets of $500, short-term debt of $70, and long-term debt of $200. What does the balance sheet look like? What is shareholders' equity? What is net working capital?

In this case, total assets are $100 + 500 = $600 and total liabilities are $70 + 200 = $270, so shareholders' equity is the difference: $600 − 270 = $330. The balance sheet would thus look like:

Assets		Liabilities and Shareholders' Equity	
Current assets	$100	Current liabilities	$ 70
Net fixed assets	500	Long-term debt	200
		Shareholders' equity	330
Total assets	$600	Total liabilities and shareholders' equity	$600

36 PART 2 Understanding Financial Statements and Cash Flow

TABLE 2.5
Cash flow summary

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

When I asked him for a loan, he responded, with a groan,
That the interest rate would be just prime plus eight,
And to guarantee my purity he'd insist on some security—

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.

Key Terms

These are printed in blue the first time they appear, and are defined within the text and in the margin.

Cash Flow from Assets

cash flow from assets
The total of cash flow to creditors and cash flow to stockholders, consisting of the following: operating cash flow, capital spending, and changes in net working capital.

operating cash flow
Cash generated from a firm's normal business activities.

Cash flow from assets involves three components: operating cash flow, capital spending, and change in net working capital. **Operating cash flow** refers to the cash flow that results from the firm's day-to-day activities of producing and selling. Expenses associated with the firm's financing of its assets are not included since they are not operating expenses.

In the normal course of events, some portion of the firm's cash flow is reinvested in the firm. *Capital spending* refers to the net spending on fixed assets (purchases of fixed assets less sales of fixed assets). Finally, *the change in net working capital* is the amount spent on net working capital. It is measured as the change in net working capital over the period being examined and represents the net increase in current assets over current liabilities. The three components of cash flow are examined in more detail below. In all our examples, all amounts are in millions of dollars.

Operating Cash Flow To calculate operating cash flow (OCF), we want to calculate revenues minus costs, but we don't want to include depreciation since it's not a cash outflow, and we don't want to include interest because it's a financing expense. We do want to include taxes, because taxes are, unfortunately, paid in cash.

pay off its debts, then whatever residual value remained would belong to the shareholders. So, the balance sheet "balances" because the value of the left-hand side always equals the value of the right-hand side. That is, the value of the firm's assets is equal to the sum of its liabilities and shareholders' equity:[1]

$$\text{Assets} = \text{Liabilities} + \text{Shareholders' equity} \qquad [2.1]$$

This is the balance sheet identity, or equation, and it always holds because shareholders' equity is defined as the difference between assets and liabilities.

Net Working Capital

As shown in Figure 2.1, the difference between a firm's current assets and its current liabilities is called **net working capital.** Net working capital is positive when current assets exceed current liabilities. Based on the definitions of current assets and current liabilities, this means that the cash that will become available over the next 12 months exceeds the

Key Equations

These are called out in the text and identified by equation numbers. Appendix B shows the key equations by chapter.

Terms of a Bond Corporate bonds usually have a face value (that is, a denomination) of $1,000. This is called the *principal value* and it is stated on the bond certificate. So, if a corporation wanted to borrow $1 million, 1,000 bonds would have to be sold. The par value (that is, initial accounting value) of a bond is almost always the same as the face value, and the terms are used interchangeably in practice.

Corporate bonds are usually in **registered form**. For example, the indenture might read as follows:

> Interest is payable semiannually on July 1 and January 1 of each year to the person in whose name the bond is registered at the close of business on June 15 or December 15, respectively.

registered form
The form of bond issue in which the registrar of the company records ownership of each bond; payment is made directly to the owner of record.

This means that the company has a registrar who will record the ownership of each bond and record any changes in ownership. The company will pay the interest and principal by check mailed directly to the address of the owner of record. A corporate bond may be reg-

Highlighted Phrases

Throughout the text, important ideas are presented separately and printed in a purple box to indicate their importance to the students.

Chapter Summary and Conclusions

These paragraphs review the chapter's key points and provide closure to the chapter.

SUMMARY AND CONCLUSIONS

This chapter has explored bonds and bond yields. We saw that:

1. Determining bond prices and yields is an application of basic discounted cash flow principles.
2. Bond values move in the direction opposite that of interest rates, leading to potential gains or losses for bond investors.
3. Bonds have a variety of features spelled out in a document called the indenture.
4. Bonds are rated based on their default risk. Some bonds, such as Treasury bonds, have no risk of default, whereas so-called junk bonds have substantial default risk.
5. A wide variety of bonds exist, many of which contain exotic, or unusual, features.
6. Almost all bond trading is OTC, with little or no market transparency. As a result, bond price and volume information can be difficult to find.

Chapter Review and Self-Test Problems

Review and self-test problems appear after the chapter summaries. Detailed answers to the self-test problems immediately follow. These questions and answers allow students to test their abilities in solving key problems related to the content of the chapter.

CHAPTER REVIEW AND SELF-TEST PROBLEMS

6.1 **Bond Values.** A Microgates Industries bond has a 10 percent coupon rate and a $1,000 face value. Interest is paid semiannually, and the bond has 20 years to maturity. If investors require a 12 percent yield, what is the bond's value? What is the effective annual yield on the bond?

6.2 **Yields.** A Macrohard Corp. bond carries an 8 percent coupon, paid semiannually. The par value is $1,000, and the bond matures in six years. If the bond currently sells for $911.37, what is its yield to maturity? What is the effective annual yield?

Answers to Chapter Review and Self-Test Problems

6.1 Because the bond has a 10 percent coupon yield and investors require a 12 percent return, we know that the bond must sell at a discount. Notice that, because the bond pays interest semiannually, the coupons amount to $100/2 = $50 every

End-of-Chapter Questions and Problems

We have found that many students learn better when they have plenty of opportunity to practice. We therefore provide extensive end-of-chapter questions and problems—many more than in the previous edition. The questions and problems are generally segregated into two levels—Basic and Intermediate. 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 questions appear in Appendix C.

www.mhhe.com/rwj

QUESTIONS AND PROBLEMS

Basic
(Questions 1–14)

1. **Changes in the Cash Account.** Indicate the impact of the following corporate actions on cash, using the letter *I* for an increase, *D* for a decrease, or *N* when no change occurs.
   - **a.** A dividend is paid with funds received from a sale of debt.
   - **b.** Real estate is purchased and paid for with short-term debt.
   - **c.** Inventory is bought on credit.
   - **d.** A short-term bank loan is repaid.
   - **e.** Next year's taxes are prepaid.
   - **f.** Preferred stock is repurchased.
   - **g.** Sales are made on credit.
   - **h.** Interest on long-term debt is paid.
   - **i.** Payments for previous sales are collected.
   - **j.** The accounts payable balance is reduced.
   - **k.** A dividend is paid.
   - **l.** Production supplies are purchased and paid for with a short-term note.
   - **m.** Utility bills are paid.
   - **n.** Cash is paid for raw materials purchased for inventory.
   - **o.** Marketable securities are purchased.
2. **Cash Equation.** Rag Doll Company has a book net worth of $38,000. Long-term debt is $6,500. Net working capital, other than cash, is $4,300. Fixed assets are $32,500. How much cash does the company have? If current liabilities are $7,200, what are current assets?
3. **Changes in the Operating Cycle.** Indicate the effect that the following will have on the operating cycle. Use the letter *I* to indicate an increase, the letter *D* for a decrease, and the letter *N* for no change.