



FUNDAMENTALS OF FINANCIAL MANAGEMENT

Fundamentals of Financial Management

Eleventh Edition

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Fundamentals of Financial Management, Eleventh Edition
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PREFACE

When the first edition of *Fundamentals* was published 28 years ago, we wanted to provide an introductory text that students would find interesting and understandable. *Fundamentals* immediately became the leading undergraduate finance text, and it has maintained that position ever since. Our goal with this edition has been to produce a book and ancillary package that will maintain its lead and set a new standard for finance textbooks.

Important changes in the financial environment have occurred since the last edition. New technology and increased globalization continue to transform practices and markets. Continued improvements in communications and transportation have made it easier for businesses to operate on a worldwide basis—a company can be headquartered in New York; develop products in India; manufacture them in China; and sell them in the United States, Europe, and the rest of the world. This has led to major changes in the labor market, especially to an increase in outsourcing, which has resulted in generally lower consumer prices, but it has caused job losses for some U.S. workers and gains for others. There have also been dramatic rises and falls in the stock market, and interest rates have plunged to record lows even as energy prices hit historic highs. Corporate scandals have led to the downfall of such giants as Enron, WorldCom, and AT&T, and this has led to important changes in the laws governing corporate management and financial reporting, as well as to equally important changes in managerial compensation. These issues are discussed in this edition of *Fundamentals*, where we analyze them from financial and ethical perspectives.

VALUATION FOCUS

The primary goal of financial management is to help managers maximize their firms' values. Therefore, the concept of valuation underlies everything in *Fundamentals*. In Chapter 1 we discuss the concept of valuation and explain its dependency on future cash flows and risk, and we show why value maximization is good for society in general. We also discuss the importance of ethical conduct and the consequences of unethical behavior, which include ruined businesses, financial losses for investors, and jail terms for guilty managers. We also explain how incentive compensation, along with the threat of takeovers, can be used to motivate managers to act in the interests of both stockholders and society at large.

The valuation theme is continued throughout the text. In Chapter 2, we take up the time value of money (TVM), a fundamental concept that underlies all of finance. The basic valuation equation as developed in Chapter 2 requires inputs—a set of cash flows in the numerator and a discount rate in the denominator. Therefore, in Chapters 3 and 4 we review basic accounting, including a discussion of cash flows and ways to analyze financial statements.

Of course, values are not established in a vacuum—stock and bond values are determined in the financial markets, so an understanding of those markets and the way they operate is essential to anyone working in finance. Therefore, in Chapter 5, we discuss the major types of financial markets, the returns that investors have historically earned in those markets, and the risks inherent in different securities. We then cover, in Chapter 6, interest rates and the factors that influence them—risk, inflation, liquidity, and the supply of and demand for capital. This leads directly into a discussion of bonds and bond valuation, in

Chapter 7. Next, in Chapter 8, we discuss risk and returns in the stock market, beginning with the risk of a stock held in isolation and then moving on to the risk of stocks held in portfolios. We then explain, in Chapter 9, how common stocks are valued.

With this background, in subsequent chapters we explain the financial tools and techniques managers use to help maximize their firms' values. Included are chapters on capital budgeting, the optimal capital structure, dividend policy, working capital, and financial forecasting. The final section of the book consists of four chapters that deal with derivatives, multinational finance, hybrid securities, and mergers.

Our organization has four important advantages:

1. Covering TVM and valuation early helps students see how expected future cash flows, along with risk-adjusted discount rates, determine the value of the firm. Also, it takes time for students to digest TVM concepts and to learn how to do the required calculations, and providing this time is another benefit of early TVM coverage.
2. Structuring the book around markets and valuation enhances continuity and helps students see how the various topics are related to one another.
3. Most students—even those who do not plan to major in finance—are interested in stock and bond values, rates of return, and the like. Because the ability to learn is a function of individual interest and motivation, and because *Fundamentals* covers securities and security markets early, our organization is pedagogically sound.
4. Once the basic concepts have been established, it is easier for students to understand both how and why corporations make specific capital budgeting, financing, and working capital decisions.

Four important advantages of the Eleventh Edition's organization.

SIGNIFICANT CHANGES IN THE ELEVENTH EDITION

A good working knowledge of finance is essential for success in business, regardless of one's specific job, because everything from marketing to human services is related to financial issues. This makes it important for anyone who plans to work in business to learn the fundamentals of finance. However, reading a finance text is different from reading a novel—one must focus on essential concepts and then work related problems to see how things tie together. For example, inflation affects interest rates, which affect stock and bond prices, which affect the feasibility of capital expenditures. To understand these relationships one must learn some basic principles and then work through problems to see how the various factors interact with one another.

Students sometimes find finance relatively abstract, and they don't see its relevance to them. This makes it difficult for professors to get students to do the work necessary to see just how interesting and relevant it really is. Based on our own and others' teaching experiences, in this edition we took a number of steps to alleviate this problem:

- *Increased student interest.* Students learn a subject best if they find it interesting, so we need to get them excited about finance. To help here, we use examples that illustrate how successful corporations apply financial principles plus examples that show how firms sometimes go astray and fail. We also explain how financial concepts can help one make better personal decisions, ranging from choosing a job, to investing, to deciding whether to lease or buy a car.

- *Provided clear explanations.* Students justifiably become frustrated and lose interest if a subject is not explained clearly. We have always tried to provide a clear, well-written text, but in this edition we used computer technology to help us make significant improvements. First, the entire book was put on electronic files, which enabled us to edit and re-edit to get the writing as clear as possible. Second, we solved all of the numerical examples with *Excel*, and this helped us tweak the numbers to make the examples more clear and consistent. Third, we shifted sections around to improve the flow both within the chapters and from one chapter to the next. In total, these changes will help students learn more in less time, which will reduce their stress and thus increase their interest and comprehension.
- *Provided timely within-chapter self-tests.* Much of finance involves numerical problems, so students must learn a concept, then become familiar with formulas, and then learn how to apply the formulas to solve specific problems. In our earlier editions, we explained and illustrated the concepts within the chapters, then provided a set of end-of-chapter problems that students could use to practice and test their knowledge. Unfortunately, students learned the concepts and understood the examples when they read the text, but by the time they got to the end-of-chapter problems they had forgotten much and had to go back and re-read the text. With this edition, we provide questions and problems (with answers) immediately after each section, which permits students to work with the concepts while things are still fresh on their minds. Again, this facilitates the learning process.
- *Ranked end-of-chapter problems by difficulty.* In past editions we arranged the end-of-chapter problems by topic, not by difficulty level. Students would often start working the problems, hit a difficult one relatively quickly, become frustrated, and give up. In this edition we arranged the problems by difficulty, identifying the first set as “Easy” ones that most students should be able to work without too much trouble; then “Intermediate” problems that are a bit harder; and then “Challenging” problems that are longer, more complex, and will perhaps require some help from the instructor. This new setup again reduces students’ stress and frustration.
- *Improved the Test Bank.* The *Test Bank* has been improved substantially, and many questions and problems that resemble the easy and intermediate end-of-chapter problems have been added. Moreover, as discussed later in this Preface, many of the problems can be algorithmically modified to create an almost infinite number of alternative versions, with different answers, for a given problem. Different instructors have different views on the way students should be tested, but the new *Test Bank* and related testing material can be used to provide students with a set of relatively straightforward problems that deal with all aspects of financial management to help them study for the exams. They will then see that if they work hard and learn how to solve the various types of problems, they will have a good grasp of finance and, consequently, should do well on exams that consist primarily of straightforward (easy and intermediate) problems. Most instructors also use a few “challenging” exam problems, where students must figure out how to apply finance concepts to deal with new and different situations they haven’t seen before. The “challenging” end-of-chapter problems are representative of this type of exam problem, and a number of them are provided in the *Test Bank*.
- *Coordinated the text, problems, and Test Bank.* Students should be rewarded for their efforts, and they become frustrated if they study hard, learn how to answer most of the problems in the text, and then face an exam where the problems are different from what they have been studying. To alleviate this problem, we have consciously coordinated the text examples, within-chapter

self-tests, end-of-chapter problems, and *Test Bank* questions and problems. If students read the text carefully and work the self-test problems, they should be able to work most of the easy end-of-chapter problems, which should prepare them for the intermediate problems, which should help with the challenging problems. Thus, students who work hard should do well on exams based on the *Test Bank*.

- *Improved coverage of the time value of money.* As noted earlier, the time value of money is the most important concept in finance, as it underlies stock and bond valuation, capital budgeting, cost of capital, lease analysis, and other key topics. However, students often have trouble grasping the basics of TVM, and this makes it almost impossible to do well in the course. To help alleviate this problem, we have taken the following steps:
 - We moved TVM forward, from Chapter 6 to Chapter 2. This gives students time to digest TVM concepts before they must use them in the bond, stock, and capital budgeting chapters.
 - As noted earlier, we added self-test *problems*, with solutions, at the end of each section. This helps students check their understanding of each type of problem before moving on.
 - We explain the basic TVM functions using a five-step procedure: We show a time line setup, go through a numerical step-by-step solution, explain a formula that simplifies the step-by-step approach, explain how the formula is programmed into a calculator and how the inputs can be entered to solve the problem very efficiently, and then (as an optional exercise) show how the problem can be worked using *Excel*. This procedure helps students see exactly what each function does, understand the mathematics of the solution process, and see how calculators (and *Excel*) can be used to solve TVM problems. This procedure helps avoid the “black box” problem, where students get answers with a calculator but don’t really know what’s happening and consequently can’t work problems that deviate from those whose solutions they have memorized.
 - We also developed revised calculator tutorials for the most popular TI and HP calculators. The tutorial illustrations are identical to our within-text examples, so when a student reads about, say, the future value in the text, he or she can simultaneously learn from the tutorial how to find the FV with a calculator. Students tell us that learning how to use their calculators as they learn TVM concepts is much more efficient than studying the two separately.
 - The TVM chapter introduces concepts covered in the bond, stock, and capital budgeting chapters, and this makes coverage of those chapters more efficient. For example, we illustrate the present values in the TVM chapter with the same cash flows that are later used in the bond, stock, and capital budgeting chapters, so in those later chapters we can refer students back to TVM for a quick refresher on the concept and solution technique.
- *Clarified capital budgeting.* This is another key concept, but again one that students have found difficult. In particular, they have trouble understanding the differences between ranking criteria such as the net present value and the internal rate of return methods. In this edition, we begin by discussing the NPV method, tie it back to the TVM chapter, explain why it’s the best ranking criterion, and then explain how the other criteria supplement the NPV. This structure reduces confusion students had in the past and gives them a better understanding of capital budgeting.
- *Reorganized the discussion of the financial environment.* Chapter 4 in the last edition was too long to be covered in a reasonable length of time. In this edition, we divided the chapter into two segments, one on financial markets and

- institutions and a second one that deals with interest rates and their determinants. The second chapter leads us into bond valuation.
- *Streamlined the discussion of working capital.* Current assets make up about half of the average firm's assets, and most students' first job after graduation is likely to deal with some aspect of working capital. However, this topic is often not covered in the introductory finance course, which means that non-finance majors never cover it at all (and it may also be skipped in advanced finance courses). We concluded that our coverage was so long, detailed, and indeed boring that many instructors simply skipped it. We totally rewrote the working capital material and cover the key points in a logical and succinct manner. Reviewers unanimously agreed that the new chapter was considerably better than the two old ones, and two reviewers even said that they enjoyed reading the chapter!

RELATIONSHIP TO OTHER THOMSON/SOUTH-WESTERN BOOKS

The growing body of financial knowledge makes it impossible to include everything about financial management that one might desire in one textbook. This led Gene Brigham to coauthor two other texts that deal with materials that go beyond what can be covered in an introductory course. The first of these is a comprehensive book aimed primarily at MBAs, *Financial Management: Theory and Practice*, Eleventh Edition, coauthored with Michael C. Ehrhardt. The second is an upper-level undergraduate text, *Intermediate Financial Management*, Ninth Edition, coauthored with Phillip R. Daves. In addition, Brigham and Houston teamed up with Roy Crum to write a text focused on financial management in an international setting, *Fundamentals of International Finance*, published by Thomson in 2005.

Also, some time ago a survey of professors indicated that some preferred a smaller, more streamlined text than *Fundamentals*. With that in mind, we created *Fundamentals of Financial Management: Concise*, which is 20 percent shorter than *Fundamentals*. Most of *Concise's* chapters are identical to the corresponding ones in *Fundamentals*, but *Fundamentals* includes an additional chapter on capital budgeting plus chapters on derivatives, hybrid securities, and mergers.

Although *Concise* has been well received, there are two significant advantages to a more complete book such as *Fundamentals*:

1. *Fundamentals* provides professors with more flexibility in designing their courses.
2. *Fundamentals* is a more complete reference book for students to use after completing the course. This is especially important for nonfinance majors, who will not otherwise have access to materials that are covered in *Fundamentals* but are omitted from *Concise*. In this regard, it should be noted that the chapters in *Fundamentals* are written in a modular, self-contained format that makes it easy for students to read them on their own.

INTENDED MARKET

Fundamentals is intended for use in an introductory finance course. The key chapters can be covered in one term, but if it is supplemented with cases and perhaps some outside readings, the book can also be used for a two-term course. When it is covered in one term, instructors generally assign only selected chapters, leaving the others for students to examine on their own or use for reference

purposes in later courses and after graduation. Note also that the chapters are written in a flexible, modular format that helps instructors cover the material in whatever sequence they choose.

ThomsonNOW: A NEW WEB-BASED COURSE RESOURCE PLATFORM

ThomsonNOW is Thomson Publishing's new Web-based delivery system, and it contains items that were in the past provided on a CD. Since ThomsonNOW is Web based, it can be changed to reflect new developments and can also operate interactively to create an unlimited number of unique test questions. ThomsonNOW includes the following items, with more to be added over time:

Test Bank

The *Test Bank* for *Fundamentals* has been enhanced in several ways.

- Many new problems and questions have been added, and those new items are now contained in Part I of each *Test Bank* chapter, with Part II containing questions carried over from the old *Test Bank*.
- The problems and questions are categorized by difficulty, and more relatively short items suitable for quizzes and time-limited exams were added.
- Many of the problems are set up so that alternative versions can be algorithmically generated—one or more of the input parameters such as the interest rate or project cost is randomly changed and thus creates a similar problem but with a different answer. This feature enables an instructor to create unique exams and online quizzes ensure that each student does his or her own work.

Practice Problems

ThomsonNOW permits an instructor to generate sets of problems that can be used for

- Graded or ungraded homework
- Online or in-class quizzes.
- Practice sets for students to use as a study aid.

With the very large number of problems in the new *Test Bank* and the algorithmic feature, a virtually unlimited number of unique problems can be generated. Conscientious students can then work many problems and learn how to deal with most finance issues, but they can't memorize answers to specific problems because each problem's answer may be unique.

Excel Models

A set of new and improved models that go through the calculations in most chapters, plus additional models tied to the end-of-chapter integrated cases, are also provided on ThomsonNOW. These models are used to generate some of the text exhibits, including those used in the capital budgeting chapters. While we do not assume that students know *Excel*, we do set the models up so that those familiar with spreadsheets can get a better feel for how they are used in practice. We also provide, in the end-of-chapter materials for most chapters, an integrated spreadsheet problem with a model accessible from ThomsonNOW that does an

analysis similar to that in the chapter, including data tables and graphs that give insights into the sensitivity of key outputs to input changes.

Thomson ONE—Business School Edition

I/B/E/S Consensus Estimates. Includes consensus estimates—averages, means, and medians; analyst-by-analyst earnings coverage; analysts' forecasts based on 15 industry standard measures; current and historic coverage for the selected 500 companies. Current history is five years forward and historic history is from 1976 for U.S. companies and 1987 for international companies; current data are updated daily, and historic are updated monthly.

Worldscope. Includes company profiles, financials, and accounting results and market per-share data for the selected 500 companies; annual information and monthly prices going back to 1980, all updated daily.

Disclosure SEC Database. Includes company profiles, annual and quarterly company financials, pricing information, and earnings estimates for selected U.S. and Canadian companies: annually from 1987, quarterly data rolling 10 years, and monthly pricing—all updated weekly.

DataStream Pricing. Daily international pricing, including share price (open, high, low, close, P/E), index, and exchange rate data. History is rolling 10 years.

ILX Systems Delayed Quotes. Includes 20-minute delayed quotes of equities and indices from U.S. and global tickers covering 130 exchanges in 25 developed countries.

Comtex Real-Time News. Includes current news releases.

SEC Edgar Filings and Global Image Source Filings. Includes regulatory and nonregulatory filings for both corporate and individual entities. Edgar filings are real-time and go back 10 years; image filings are updated daily and go back 7 years.

OTHER FEATURES OF THE ELEVENTH EDITION

Recent Financial Events

The past few years have witnessed great turmoil in the financial markets. We have seen an incredible rise and fall of the stock market and the stunning collapses of Enron, WorldCom, Arthur Andersen, and others. Some of these problems were caused by fraud and questionable accounting practices, which, in turn, stemmed largely from badly designed executive compensation programs. As we discuss in Chapter 1, the focus of many top executives shifted from maximizing their firms' long-run stock prices to maximizing prices on the day the executives' own stock options vested and could be sold. We consider the effects of this shift in focus, and ways to move the focus back to the long run and thus to benefit all parties, not just executives with stock options.

We also updated Chapters 6, 7, 8, and 9 to reflect the many changes that have occurred in the stock and bond markets since the last edition. We also restructured these chapters to improve the flow, and we streamlined the coverage of yield curves.

Revised Treatment of Financial Statements

In the wake of the corporate scandals, we have taken steps to enhance our discussion of financial statements and accounting-related issues. In Chapter 3, we continue our emphasis on cash flow, and we expanded our discussion of the

differences between net income, net cash flow, and free cash flow. We also streamlined the discussion of taxes, focusing on the major tax issues facing investors and corporations but leaving many details for a Web Appendix, which can be found on ThomsonNOW.

Reworked Section on Market Efficiency and Behavioral Finance

The events surrounding the stock market bubble have led many to reevaluate the efficiency of financial markets, which, in turn, generated new academic research in the area of behavioral finance. While most authorities still believe that market efficiency is a cornerstone of finance, market efficiency does have limitations. Consequently, we discuss the evidence regarding the extent of stock market efficiency, along with the implications of behavioral finance.

Web Appendixes

To make room for important new materials and to streamline the book, we moved certain interesting but secondary material to appendixes available through ThomsonNOW. References to these appendixes are provided in the relevant text chapters.

Streamlined Discussion of the Time Value of Money

As noted earlier, we took several steps to increase the readability of this critically important chapter. First, we moved it from Chapter 6 to Chapter 2 to give students more time to digest it before using it in the bond, stock, and capital budgeting chapters. We also added end-of-section self-tests to ensure that students can work with the function that was just discussed before moving on to the next one, and we provide (on ThomsonNOW) tutorials on the most popular calculators to help in this regard. The new setup helps students *understand* the fundamental issues in TVM and work problems efficiently, but without falling into the “black box trap” of knowing how to work specific problems but not understanding concepts well enough to deal with problems that are structured somewhat differently.

Changes in the Working Capital Chapter

As noted earlier, we totally rewrote the working capital material, reducing it from two chapters to one to cover the key points in a logical and succinct manner. Reviewers unanimously agreed that the new chapter was considerably better than the two old ones. A quote from one reviewer summarizes their conclusions:

I like the abbreviated one-chapter approach. I looked at the old Tenth Edition chapter again, and I like the new one much better—it is more readable than the original two chapters, and I actually enjoyed reading it. The two-chapter approach provided too much extraneous and confusing information. The new and more concise presentation gives introductory students exactly what they need. Also, the new chapter is so much better than the previous two that I could assign it to students to read and learn on their own. I would, however, cover the cash budget in class because that is a bit more complicated, but even cash budgeting is much better presented here.

Another reviewer stated that he has been skipping working capital in his class because, as it was presented, it would take too long to cover it, but that he planned to cover the chapter in its new format. We expect others to agree.

Analyzing Financial Decisions with Spreadsheets

We developed spreadsheet models for each chapter in the book except Chapters 1 and 5. Spreadsheet programs are ideally suited for analyzing many financial issues, and a knowledge of spreadsheets is rapidly becoming essential for people in business. Therefore, we indicate how spreadsheets are used to deal with the issues discussed in the text.

However, we recognize that students need to understand basic finance concepts before going into computer modeling. Therefore, in the text chapters, we discuss finance concepts, provide examples, and explain how the concepts are used in the decision process. Where the analysis involves arithmetic, we assume that students are using calculators. However, if the problem is one that could be solved more efficiently with a computer, we briefly describe how the computer would be used. These explanations are short, easy to follow, and can be skipped without loss of continuity. Thus, students get an idea of how they could go from calculators to spreadsheets, but they don't need to take that step. However, if an instructor wants to emphasize computers in the course, or if an individual student wants to learn more about spreadsheets on his or her own, the spreadsheet models available from ThomsonNOW make that relatively easy.

Also, we provide on ThomsonNOW an *Excel* tutorial that explains the functions and procedures used in the models. The tutorial has an index that makes it relatively easy to find information about each function and feature, and students can use the models and tutorial to learn *Excel* on their own.

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CONTENTS

Part I Introduction to Financial Management

Chapter 1 An Overview of Financial Management

- Significantly revised and improved. New vignette, "Striking the Right Balance," discusses trade-off of maximizing shareholder value and making decisions that benefit society. Chapter emphasizes value orientation with discussion of relationship among shareholder value, intrinsic values, and stock prices. Enhanced and expanded discussion of business ethics. New boxes: "Is Shareholder Wealth Maximization a World-Wide Goal?"; "Protection for Whistle-Blowers."

Part II Fundamental Concepts in Financial Management

Chapter 2 Time Value of Money

- Improved! Moved from Chapter 6 to Chapter 2 to allow students more time to grasp the concepts. Discussion made clearer, takes less of a "black-box" approach; formulas are given. Added section, "Finding Annuity Payments, Periods, and Interest Rates." New boxes: "Simple versus Compound Interest"; "Hints on Using Financial Calculators."

Chapter 3 Financial Statements, Cash Flow, and Taxes

- Improved! New Figure 3-1 diagrams a typical balance sheet to aid students with the discussion. Reorganized chapter so cash flow discussion immediately follows income statement and precedes cash flow statements. "Uses and Limitations of Financial Statements" section moved so it precedes discussion on "Modifying Accounting Data for Investor and Managerial Decisions." MVA and EVA discussion shortened; not as computationally oriented. Updated tax discussion. New box: "Massaging the Cash Flow Statement."

Chapter 4 Analysis of Financial Statements

- Updated vignette. Improved financial leverage discussion in "Debt Management Ratios" section. Updated Table 4-3. New box: "Global Perspectives: Global Accounting Standards: Can One Size Fit All?"

Chapter 5 Financial Markets and Institutions

- Created from dividing Tenth Edition Chapter 4 into two separate chapters. New vignette: "A Strong Financial System Is Necessary for a Growing and Prosperous Economy." Reorganized to present overview of capital allocation process before discussing financial markets and institutions. Brought in discussions on "Market for Common Stock," "Stock Markets and Returns," and "Stock Market Efficiency" from old Stock chapter for better integration. Updated Tables 5-1, 5-2, and 5-3. Added discussion of hedge funds. Updated "Measuring the Market" box. New boxes: "Citigroup Built to Compete in a Changing Environment"; "The NYSE and Nasdaq Combine Forces with the Leading Online Trading Systems"; "A Closer Look at Behavioral Finance Theory."

Part III Financial Assets

Chapter 6 Interest Rates

- New chapter created from dividing Tenth Edition Chapter 4 into two separate chapters. Vignette highlights the discussion presented in chapter, "Low Interest Rates Encourage Investment and Stimulate Consumer Spending." All figures updated to show current economic situation. Rewrote and clarified section, "Using the Yield Curve to Estimate Future Interest Rates." Reorganized so that discussion of "Other Factors That Influence Interest Rate Levels" immediately follows the section on "Using the Yield Curve to Estimate Future Interest Rates." Updated boxes: "An Almost Riskless Treasury Security Bond" and "Global Perspectives: Measuring Country Risk." New box: "The Links between Expected Inflation and Interest Rates: A Closer Look."

Chapter 7 Bonds and Their Valuation

Chapter 8 Risk and Rates of Return

Chapter 9 Stocks and Their Valuation

- Improved! Reorganized chapter so that bond valuation and then bond yields are discussed before the section on "Changes in Bond Values over Time." Added Table 7-1 to clarify discussion of changes in bond values. Reduced discussion of bankruptcy and reorganization (which is in Web Appendix) and enhanced discussion of bond markets.

Part IV Investing in Long-Term Assets: Capital Budgeting

Chapter 10 The Cost of Capital

- Improved! Moved chapter to immediately precede chapter on stocks to help integrate concepts. Moved extensive footnote in prior edition on using historical data to measure risk into text. Updated box, "The Trade-Off between Risk and Return." Revised Figure 8-7 so partial correlation between stocks coincides with recent studies (0.35 vs. 0.67). Added new section, "Some Concluding Thoughts: Implications for Corporate Managers and Investors."

Chapter 11 The Basics of Capital Budgeting

- Improved! New vignette, "Searching for the Right Stock." Moved market, returns, and efficient markets discussion to new Chapter 5 to allow for almost immediate discussion on stock valuation. Enhanced discussion of corporate valuation model.

- Improved! Enhanced discussion on the overview of the WACC along with new Figure 10-1, which is meant to improve students' understanding of different types of capital. WACC equation presented early in the chapter, followed by discussion of the individual cost components and their calculations. Added second-level headings in "Cost of New Common Stock" to clarify the discussion. Eliminated duplication of project risk discussion, which has now been moved to Chapter 12—where it fits better.

- Improved! New vignette, "Competition in the Aircraft Industry," details the chapter's concepts. Reorganized chapter discussion so NPV discussion appears early and is stressed as the best capital budgeting decision rule. Added discussion section, "Decision Criteria Used in Practice."

- Chapter 12** Cash Flow Estimation and Risk Analysis → ■ Improved! Chapter begins with a fairly extensive capital budgeting illustration as an overview and lead-in to discussing capital budgeting concepts. Chapter then proceeds with other capital budgeting details, allowing professors to get the general idea of capital budgeting analysis across without having to cover the entire chapter (which was the case in the prior edition).
- Chapter 13** Other Topics in Capital Budgeting → ■ Improved! Reorganized to present real options discussion early. Mutually exclusive projects with unequal lives (both replacement chain and EAA approaches) then discussed.
- Part V Capital Structure and Dividend Policy**
- Chapter 14** Capital Structure and Leverage → ■ Updated vignette on Kellogg Co. and Table 14-4. Clarified illustration and chapter discussion of concepts.
- Chapter 15** Distributions to Shareholders: Dividends and Share Repurchases → ■ Improved! New vignette, "Microsoft Shifts Gears and Begins to Unload Part of Its Vast Cash Hoard," illustrates a recent event that ties in with chapter concepts. Improved discussion of dividend theories for recent tax changes. Enhanced discussion of investor preferences for dividends versus capital gains. Eliminated dividend stability section. Updated box, "Global Perspectives: Dividend Yields Around the World." New box: "Stock Repurchases Soar in 2004."
- Part VI Working Capital and Financial Forecasting**
- Chapter 16** Working Capital Management → ■ Improved! Combined two chapters into one. Presented overview of working capital management by discussing cash conversion cycle and current asset investment and financing policies. Chapter also discusses some of the more important accounts in greater detail, such as cash (including cash budgeting) and marketable securities, accounts receivable, accounts payable, bank loans, and accrued liabilities.
- Chapter 17** Financial Planning and Forecasting → ■ Improved! New vignette, "Forecasting Apple's Future." Rather than focusing on the "mechanics" of forecasting, the presentation stresses understanding the concepts involved. The AFN equation is presented earlier in the chapter to help students understand the concepts involved. Enhanced discussion with use of spreadsheets, regression analysis, and individual ratios in forecasting process.
- Part VII Special Topics in Financial Management**
- Chapter 18** Derivatives and Risk Management → ■ Reconstructed Table 18-1 to use real numbers developed from data available on the Internet. Added Web address to tell students where to obtain call and put option data. Rewrote box, "Expensing Executive Stock Options," to incorporate the new stock option accounting rule. Reworked OPM illustration and Table 18-2 for a much lower, more current risk-free rate. Revised "Forward and Futures Contracts" section to incorporate hedging example with futures all within same section. "Other Types of Derivatives" section excludes forward and futures and includes only swaps, structured notes, and inverse floater. New box: "Credit Instruments Create New Opportunities and Risks."
- Chapter 19** Multinational Financial Management → ■ Improved! Reorganized chapter to present discussion of international monetary system, terminology, and current monetary arrangements early. Exchange rates and cross rates are presented next. Enhanced discussion of international money and capital markets. Updated boxes: "Hungry for a Big Mac? Go to China!" and "Stock Market Indices Around the World."
- Chapter 20** Hybrid Financing: Preferred Stock, Leasing, Warrants, and Convertibles → ■ Generally clarified sections for students.
- Chapter 21** Mergers and Acquisitions → ■ Generally updated chapter for new mergers/acquisitions. New vignette about Procter & Gamble merger. Updated Table 21-2 for recent larger mergers. Reworked merger illustration for a lower, more current cost of equity number. Updated "Financial Reporting for Mergers" to exclude pooling method for mergers. New boxes: "Tempest in a Teapot"; "The Track Record of Recent Large Mergers."

THE INSTRUCTIONAL PACKAGE: AN INTEGRATED SYSTEM

Fundamentals offers an innovative, technologically advanced ancillary package to enhance students' learning and to make it easier for instructors to prepare for and conduct classes. The integrated package includes many outstanding resources, all of which have been revised and updated for the new Eleventh Edition.

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- ***Fundamentals of Financial Management Online Course***—Delivered via the WebTutor platform, this integrated Web-based learning environment accompanies the textbook and ancillary package with the vast resources of the Internet and the convenience of anytime learning. Extremely user friendly, the powerful customization features of the WebTutor framework enable instructors to customize this online course to their own unique teaching styles and their students' individual needs. Course features include content keyed to the Eleventh Edition, self-tests and online exams, Internet activities and links to related resources, a suggested course syllabus, student and instructor materials, free technical support for instructors, and much more. Available for both Blackboard and WebCT platforms.
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- ***Test Bank***—The revised and enhanced large *Test Bank* contains more than 1,500 class-tested questions and problems, is now broken into two parts, and is available both in print and electronic form. Part I has all new or substantially revised questions and problems, and Part II contains holdover items from the previous *Test Bank*. Many of the problems in Part I can be algorithmically modified in ThomsonNOW, which enables instructors to create an almost unlimited number of unique problems. Information regard-

ing the topics, degree of difficulty, and the correct answers, along with complete solutions for all numerical problems, is provided with each question. A version of the *Test Bank in Word* is also available to instructors for downloading.

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- **NewsWire: Finance in the News**—Adopters of *Fundamentals* will have access to a password-protected portion of the South-Western Finance Web site, where they will be provided with summaries of recent articles in *The Wall Street Journal*, *BusinessWeek*, or other major business publications, along with discussion questions and references to the text. These summaries, written by Emery Trahan and Paul Bolster of Northeastern University, facilitate incorporating late-breaking news into classroom discussions.

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 - **Introductory Video and Ask the Author Video**—Introductory video pieces, as illustrated by text coauthor Eugene F. Brigham, set the tone for the study of each chapter. These streaming video clips provide context for the forthcoming reading and exercises. Upon finishing a chapter, they may be used as excellent review tools for summarizing key points and major concepts. In the Ask the Author video, difficult concepts and frequently asked questions from each chapter are explained and illustrated by the textbook coauthor, Joel F. Houston. These video clips can be extremely helpful review and clarification tools if you have trouble understanding an in-class lecture or if you are a visual learner.
 - **Online Homework and Additional Quizzing and Testing**—In addition to including online access to the end of chapter problem material, ThomsonNOW offers an opportunity to practice for midterms and finals by taking online quizzes that span multiple chapters.

- **The Problem Bank**—*The Problem Bank: Practice Problems for Financial Management* has been revised to fit specifically with this text and contains more than 400 multiple-choice finance problems with solutions, divided into seven major categories such as time value of money, capital budgeting, and risk and return. Solving these problems requires the use of a financial calculator (general calculator keystrokes also are provided) and is intended to supplement the text's end-of-chapter problems, thereby providing additional practice for students in their preparation of homework assignments and for exams.
- **Spreadsheet Models**—ThomsonNOW also contains spreadsheet models that illustrate how concepts covered in the text are implemented in the real world, giving students a significant advantage in the job market. The models include thorough explanations and serve both as an *Excel* tutorial and as a template for solving financial problems for each chapter of the book.
- **Thomson ONE—Business School Edition**—Use the Thomson ONE Academic online database to work a chapter's Thomson ONE—Business School Edition problem. Thomson ONE—Business School Edition, a product from Thomson Financial, combines a full range of fundamental financials, earnings estimates, market data, and source documents for hundreds of real-world companies. This is your opportunity to access and apply the industry's most reliable information to answer the discussion questions and work through group projects.
- **Study Guide**—This supplement lists the key learning objectives for each chapter, outlines the key sections, provides self-test questions, and provides a set of problems similar to those in the text and the *Test Bank*, but with fully worked-out solutions.
- **Spreadsheet Books**—Thomson/South-Western has published several books on spreadsheets, including *Financial Analysis with Microsoft Excel*, Third Edition.
- **Effective Use of a Financial Calculator**—Written by Pamela Hall, this handbook is designed to help increase students' understanding of both finance and financial calculators, enabling them to work problems more quickly and effectively.

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ERRORS IN THE TEXTBOOK

At this point, most authors make a statement like this: "We appreciate all the help we received from the people listed above, but any remaining errors are, of course, our own responsibility." And generally there are more than enough remaining errors! Having experienced difficulties with errors ourselves, both as students and instructors, we resolved to avoid this problem in *Fundamentals*. As a result of our detection procedures, we are convinced that this book is relatively free of significant errors, meaning those that either confuse or distract readers.

Partly because of our confidence that few such errors remain, but primarily because we want very much to detect any errors that may have slipped by to correct them in subsequent printings, we decided to offer a reward of \$10 per error to the first person who reports it to us. For purpose of this reward, errors are defined as misspelled words, nonrounding numerical errors, incorrect statements, and any other error that inhibits comprehension. Typesetting problems such as irregular spacing and differences of opinion regarding grammatical or punctuation conventions do not qualify for this reward. Given the ever-changing nature of the World Wide Web, changes in Web addresses also do not qualify as errors, although we would like to learn about them. Finally, any qualifying error that has follow-through effects is counted as two errors only. Please report any errors to Joel Houston either through e-mail at fundamentals@joelhouston.com or by regular mail at the address below.

CONCLUSION

Finance is, in a real sense, the cornerstone of the enterprise system—good financial management is vitally important to the economic health of business firms, hence to the nation and the world. Because of its importance, finance should be widely and thoroughly understood, but this is easier said than done. The field is relatively complex, and it is undergoing constant change in response to shifts in economic conditions. All of this makes finance stimulating and exciting, but also challenging and sometimes perplexing. We sincerely hope that this Eleventh Edition of *Fundamentals* will meet its own challenge by contributing to a better understanding of our financial system.

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Selected Equations and Data

CHAPTER 2

$$FV_N = PV(1 + I)^N$$

$$PV = \frac{FV_N}{(1 + I)^N}$$

$$FVA_N = PMT \left[\frac{(1 + I)^N - 1}{I} \right]$$

$$FVA_{Due} = FVA_{Ordinary}(1 + I)$$

$$PVA_N = PMT \left[\frac{1 - \frac{1}{(1 + I)^N}}{I} \right]$$

$$PVA_{N Due} = PVA_{Ordinary}(1 + I)$$

$$PV \text{ of a perpetuity} = \frac{PMT}{I}$$

$$PV_{\text{Uneven stream}} = \sum_{t=1}^N \frac{CF_t}{(1 + I)^t}$$

$$I_{PER} = \frac{I}{M}$$

$$APR = (I_{PER})M$$

$$\text{Number of periods} = NM$$

$$EFF\% = \left(1 + \frac{I_{NOM}}{M} \right)^M - 1.0$$

CHAPTER 3

$$EBIT = \text{Sales revenues} - \text{Operating costs}$$

$$\text{Net cash flow} = \text{Net income} + \text{Depreciation and amortization}$$

$$\text{Net operating working capital} = \frac{\text{All current assets required in operations}}{\text{All non-interest-bearing current liabilities}}$$

$$\text{Net operating working capital} = \left(\begin{array}{l} \text{Cash} \\ \text{and cash} \\ \text{equivalents} \end{array} + \begin{array}{l} \text{Accounts} \\ \text{receivable} \end{array} + \begin{array}{l} \text{Inventories} \end{array} \right) - \left(\begin{array}{l} \text{Accounts} \\ \text{payable} \end{array} + \begin{array}{l} \text{Accruals} \end{array} \right)$$

$$\text{Total operating capital} = \text{Net operating working capital} + \text{Net fixed assets}$$

$$NOPAT = EBIT(1 - \text{Tax rate})$$

$$\text{Operating cash flow} = NOPAT + \text{Depreciation and amortization}$$

$$FCF = \left[EBIT(1 - T) + \frac{\text{Depreciation and amortization}}{\text{amortization}} \right] - \left[\frac{\text{Capital expenditures}}{\text{expenditures}} + \frac{\Delta \text{Net operating working capital}}{\text{working capital}} \right]$$

Free cash flow = Operating cash flow – Investment in operating capital

MVA = Market value of stock – Equity capital supplied by shareholders
 = [(Shares outstanding)(Stock price)] – Total common equity

EVA = NOPAT – Annual dollar cost of capital
 = (EBIT)(1 – T) – $\left(\frac{\text{Total investor-supplied operating capital}}{\text{After-tax percentage cost of capital}} \right)$

CHAPTER 4

Current ratio = $\frac{\text{Current assets}}{\text{Current liabilities}}$

Quick, or acid test, ratio = $\frac{\text{Current assets} - \text{Inventories}}{\text{Current liabilities}}$

Inventory turnover ratio = $\frac{\text{Sales}}{\text{Inventories}}$

DSO = Days sales outstanding = $\frac{\text{Receivables}}{\text{Average sales per day}} = \frac{\text{Receivables}}{\text{Annual sales}/365}$

Fixed assets turnover ratio = $\frac{\text{Sales}}{\text{Net fixed assets}}$

Total assets turnover ratio = $\frac{\text{Sales}}{\text{Total assets}}$

Debt ratio = $\frac{\text{Total debt}}{\text{Total assets}}$

$D/A = \frac{D/E}{1 + D/E}$

Debt ratio = $1 - \frac{1}{\text{Equity multiplier}}$

$D/E = \frac{D/A}{1 - D/A}$

Times-interest-earned (TIE) ratio = $\frac{\text{EBIT}}{\text{Interest charges}}$

EBITDA coverage ratio = $\frac{\text{EBITDA} + \text{Lease payments}}{\text{Interest} + \text{Principal payments} + \text{Lease payments}}$

Profit margin on sales = $\frac{\text{Net income}}{\text{Sales}}$

Return on total assets (ROA) = $\frac{\text{Net income}}{\text{Total assets}}$

Basic earning power (BEP) ratio = $\frac{\text{EBIT}}{\text{Total assets}}$

ROA = Profit margin × Total assets turnover

$\text{ROA} = \frac{\text{Net income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total assets}}$

Return on common equity (ROE) = $\frac{\text{Net income}}{\text{Common equity}}$

$$\begin{aligned} \text{ROE} &= \text{ROA} \times \text{Equity multiplier} \\ &= \text{Profit margin} \times \text{Total assets turnover} \times \text{Equity multiplier} \\ &= \frac{\text{Net income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total assets}} \times \frac{\text{Total assets}}{\text{Common equity}} \end{aligned}$$

$$\text{Return on investors' capital} = \frac{\text{Net income} + \text{Interest}}{\text{Debt} + \text{Equity}}$$

$$\text{Price/earnings (P/E) ratio} = \frac{\text{Price per share}}{\text{Earnings per share}}$$

$$\text{Price/cash flow ratio} = \frac{\text{Price per share}}{\text{Cash flow per share}}$$

$$\text{Book value per share} = \frac{\text{Common equity}}{\text{Shares outstanding}}$$

$$\text{Market/book (M/B) ratio} = \frac{\text{Market price per share}}{\text{Book value per share}}$$

$$\text{EVA} = \text{Net income} - \left(\text{Equity capital} \times \% \text{ Cost of equity capital} \right)$$

$$\text{EVA} = \text{Equity capital} \times (\text{ROE} - \% \text{ Cost of equity capital})$$

CHAPTER 6

$$r = r^* + \text{IP} + \text{DRP} + \text{LP} + \text{MRP}$$

$$r_{\text{RF}} = r^* + \text{IP}$$

Considering cross term, $r_{\text{RF}} = r^* + I + (r^* \times I)$. Assume no cross term, unless specified.

$$r = r_{\text{RF}} + \text{DRP} + \text{LP} + \text{MRP}$$

$$\text{IP}_N = \frac{I_1 + I_2 + \cdots + I_N}{N}$$

CHAPTER 7

$$V_B = \sum_{t=1}^N \frac{\text{INT}}{(1 + r_d)^t} + \frac{M}{(1 + r_d)^N}$$

$$\text{Price of callable bond} = \sum_{t=1}^N \frac{\text{INT}}{(1 + r_d)^t} + \frac{\text{Call price}}{(1 + r_d)^N}$$

$$\text{Current yield} = \frac{\text{Annual interest}}{\text{Bond's current price}}$$

$$V_B = \sum_{t=1}^{2N} \frac{\text{INT}/2}{(1 + r_d/2)^t} + \frac{M}{(1 + r_d/2)^{2N}}$$

CHAPTER 8

$$\text{Expected rate of return} = \hat{r} = \sum_{i=1}^N P_i r_i$$

$$\text{Variance} = \sigma^2 = \sum_{i=1}^N (r_i - \hat{r})^2 P_i$$

$$\text{Standard deviation} = \sigma = \sqrt{\sum_{i=1}^N (r_i - \hat{r})^2 P_i}$$

$$\text{Estimated } \sigma = S = \sqrt{\frac{\sum_{t=1}^N (\bar{r}_t - \bar{r}_{Avg})^2}{N - 1}}$$

$$CV = \frac{\sigma}{\hat{r}}$$

$$\hat{r}_p = \sum_{i=1}^N w_i \hat{r}_i$$

$$\sigma_p = \sqrt{\sum_{j=1}^N (r_{pj} - \hat{r}_p)^2 P_j}$$

$$b_p = \sum_{i=1}^N w_i b_i$$

$$RP_i = (r_M - r_{RF}) b_i = (RP_M) b_i$$

$$SML = r_i = r_{RF} + (r_M - r_{RF}) b_i$$

CHAPTER 9

$$\hat{P}_0 = \text{PV of expected future dividends} = \sum_{t=1}^{\infty} \frac{D_t}{(1 + r_s)^t}$$

$$\hat{P}_0 = \frac{D_0(1 + g)}{r_s - g} = \frac{D_1}{r_s - g}$$

$$\hat{r}_s = \frac{D_1}{P_0} + g$$

$$\text{Capital gains yield} = \frac{\hat{P}_1 - P_0}{P_0}$$

$$\text{Dividend yield} = \frac{D_1}{P_0}$$

$$\text{For a constant growth stock, } \hat{P}_N = P_0(1 + g)^N$$

$$\text{For a zero growth stock, } \hat{P}_0 = \frac{D}{r_s}$$

$$\text{Horizon value} = \hat{P}_N = \frac{D_{N+1}}{r_s - g}$$

$$V_{\text{Company}} = \frac{FCF_1}{(1 + WACC)^1} + \frac{FCF_2}{(1 + WACC)^2} + \cdots + \frac{FCF_{\infty}}{(1 + WACC)^{\infty}}$$

$$\text{Terminal value} = V_{\text{Company at } t=N} = \frac{FCF_{N+1}}{WACC - g_{FCF}}$$

$$V_p = \frac{D_p}{r_p}$$

$$\hat{r}_p = \frac{D_p}{V_p}$$

CHAPTER 10

After-tax component cost of debt = $r_d(1 - T)$

Component cost of preferred stock = $r_p = \frac{D_p}{P_p}$

$r_s = \hat{r}_s = r_{RF} + RP = D_1/P_0 + g$

$r_s = \text{Bond yield} + \text{Risk premium}$

$$r_e = \frac{D_1}{P_0(1 - F)} + g$$

$g = (\text{Retention rate})(\text{ROE}) = (1.0 - \text{Payout rate})(\text{ROE})$

$$RE_{\text{Breakpoint}} = \frac{\text{Addition to retained earnings}}{\text{Equity fraction}}$$

$\text{WACC} = w_d r_d(1 - T) + w_p r_p + w_c r_s$

CHAPTER 11

$$\begin{aligned} \text{NPV} &= CF_0 + \frac{CF_1}{(1+r)^1} + \frac{CF_2}{(1+r)^2} + \dots + \frac{CF_N}{(1+r)^N} \\ &= \sum_{t=0}^N \frac{CF_t}{(1+r)^t} \end{aligned}$$

$$\text{IRR: } \sum_{t=0}^N \frac{CF_t}{(1+\text{IRR})^t} = 0$$

MIRR: PV costs = PV terminal value

$$\begin{aligned} \sum_{t=0}^N \frac{\text{COF}}{(1+r)^t} &= \frac{\sum_{t=0}^N \text{CIF}_t (1+r)^{N-t}}{(1+\text{MIRR})^N} \\ \text{PV costs} &= \frac{\text{TV}}{(1+\text{MIRR})^N} \end{aligned}$$

$\text{Payback} = \text{Number of years prior to full recovery} + \frac{\text{Unrecovered cost at start of full recovery year}}{\text{Cash flow during full recovery year}}$

CHAPTER 14

$\text{EBIT} = \text{PQ} - \text{VQ} - \text{F}$

$$Q_{\text{BE}} = \frac{\text{F}}{\text{P} - \text{V}}$$

$$\text{EPS} = \frac{(S - FC - VC - I)(1 - T)}{\text{Shares outstanding}} = \frac{(\text{EBIT} - I)(1 - T)}{\text{Shares outstanding}}$$

$$b_L = b_U[1 + (1 - T)(D/E)]$$

$$b_U = b_L/[1 + (1 - T)(D/E)]$$

$$r_s = r_{RF} + \text{Premium for business risk} + \text{Premium for financial risk}$$

CHAPTER 15

$$\text{Dividends} = \text{Net income} - [(\text{Target equity ratio})(\text{Total capital budget})]$$

CHAPTER 16

$$\begin{array}{cccc} \text{Inventory} & \text{Average} & \text{Payables} & \text{Cash} \\ \text{conversion} & \text{collection} & \text{deferral} & \text{conversion} \\ \text{period} & \text{period} & \text{period} & \text{cycle} \end{array}$$

$$\text{Inventory conversion period} = \frac{\text{Inventory}}{\text{Cost of goods sold}/365}$$

$$\text{Average collection period} = \text{DSO} = \frac{\text{Receivables}}{\text{Sales}/365}$$

$$\text{Payables deferral period} = \frac{\text{Payables}}{\text{Cost of goods sold}/365}$$

$$\text{Accounts receivable} = \text{Credit sales per day} \times \text{Length of collection period}$$

$$\text{ADS} = \frac{(\text{Units sold})(\text{Sales price})}{365} = \frac{\text{Annual sales}}{365}$$

$$\text{Receivables} = (\text{ADS})(\text{DSO})$$

$$\text{Nominal annual cost of trade credit} = \frac{\text{Discount \%}}{100 - \text{Discount \%}} \times \frac{365}{\text{Days credit is outstanding} - \text{Discount period}}$$

$$\text{Simple interest rate per day} = \frac{\text{Nominal rate}}{\text{Days in year}}$$

$$\text{Simple interest charge for period} = (\text{Days in period})(\text{Rate per day})(\text{Amount of loan})$$

$$\text{Approximate annual rate}_{\text{Add-on}} = \frac{\text{Interest paid}}{(\text{Amount received})/2}$$

$$\text{APR} = (\text{Periods per year})(\text{Rate per period})$$

$$\text{Effective annual rate}_{\text{Add-on}} = (1 + r_d)^N - 1.0$$

CHAPTER 17

$$\begin{array}{ccccc} & \text{Required} & \text{Spontaneous} & \text{Increase in} & \\ \text{AFN} = & \text{asset} & \text{liability} & \text{retained} & \\ & \text{increase} & \text{increase} & \text{earnings} & \end{array}$$

$$= (A^*/S_0)\Delta S - (L^*/S_0)\Delta S - MS_1(\text{RR})$$

$$\text{Full capacity sales} = \frac{\text{Actual sales}}{\text{Percentage of capacity at which fixed assets were operated}}$$

$$\text{Target FA/Sales ratio} = \frac{\text{Actual fixed assets}}{\text{Full capacity sales}}$$

$$\text{Required level of FA} = (\text{Target FA/Sales ratio})(\text{Projected sales})$$

CHAPTER 18

$$\text{Exercise value} = \text{Current price of stock} - \text{Strike price}$$

$$V = P[N(d_1)] - Xe^{-r_{\text{RF}}t}[N(d_2)]$$

$$d_1 = \frac{\ln(P/X) + [r_{\text{RF}} + (\sigma^2/2)]t}{\sigma\sqrt{t}}$$

$$d_2 = d_1 - \sigma\sqrt{t}$$

Values of the Areas under the Standard Normal Distribution Function

z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	.0000	.0040	.0080	.0120	.0160	.0199	.0239	.0279	.0319	.0359
0.1	.0398	.0438	.0478	.0517	.0557	.0596	.0636	.0675	.0714	.0753
0.2	.0793	.0832	.0871	.0910	.0948	.0987	.1026	.1064	.1103	.1141
0.3	.1179	.1217	.1255	.1293	.1331	.1368	.1406	.1443	.1480	.1517
0.4	.1554	.1591	.1628	.1664	.1700	.1736	.1772	.1808	.1844	.1879
0.5	.1915	.1950	.1985	.2019	.2054	.2088	.2123	.2157	.2190	.2224
0.6	.2257	.2291	.2324	.2357	.2389	.2422	.2454	.2486	.2517	.2549
0.7	.2580	.2611	.2642	.2673	.2704	.2734	.2764	.2794	.2823	.2852
0.8	.2881	.2910	.2939	.2967	.2995	.3023	.3051	.3078	.3106	.3133
0.9	.3159	.3186	.3212	.3238	.3264	.3289	.3315	.3340	.3365	.3389
1.0	.3413	.3438	.3461	.3485	.3508	.3531	.3554	.3577	.3599	.3621
1.1	.3643	.3665	.3686	.3708	.3729	.3749	.3770	.3790	.3810	.3830
1.2	.3849	.3869	.3888	.3907	.3925	.3944	.3962	.3980	.3997	.4015
1.3	.4032	.4049	.4066	.4082	.4099	.4115	.4131	.4147	.4162	.4177
1.4	.4192	.4207	.4222	.4236	.4251	.4265	.4279	.4292	.4306	.4319
1.5	.4332	.4345	.4357	.4370	.4382	.4394	.4406	.4418	.4429	.4441
1.6	.4452	.4463	.4474	.4484	.4495	.4505	.4515	.4525	.4535	.4545
1.7	.4554	.4564	.4573	.4582	.4591	.4599	.4608	.4616	.4625	.4633
1.8	.4641	.4649	.4656	.4664	.4671	.4678	.4686	.4693	.4699	.4706
1.9	.4713	.4719	.4726	.4732	.4738	.4744	.4750	.4756	.4761	.4767
2.0	.4773	.4778	.4783	.4788	.4793	.4798	.4803	.4808	.4812	.4817
2.1	.4821	.4826	.4830	.4834	.4838	.4842	.4846	.4850	.4854	.4857
2.2	.4861	.4864	.4868	.4871	.4875	.4878	.4881	.4884	.4887	.4890
2.3	.4893	.4896	.4898	.4901	.4904	.4906	.4909	.4911	.4913	.4916
2.4	.4918	.4920	.4922	.4925	.4927	.4929	.4931	.4932	.4934	.4936
2.5	.4938	.4940	.4941	.4943	.4945	.4946	.4948	.4949	.4951	.4952
2.6	.4953	.4955	.4956	.4957	.4959	.4960	.4961	.4962	.4963	.4964
2.7	.4965	.4966	.4967	.4968	.4969	.4970	.4971	.4972	.4973	.4974
2.8	.4974	.4975	.4976	.4977	.4977	.4978	.4979	.4979	.4980	.4981
2.9	.4981	.4982	.4982	.4982	.4984	.4984	.4985	.4985	.4986	.4986
3.0	.4987	.4987	.4987	.4988	.4988	.4989	.4989	.4989	.4990	.4990

CHAPTER 19

$$\frac{\text{Forward exchange rate}}{\text{Spot exchange rate}} = \frac{1 + r_h}{1 + r_f}$$

$$P_h = (P_f)(\text{Spot rate})$$

$$\text{Spot rate} = \frac{P_h}{P_f}$$

CHAPTER 20

Price paid for bond with warrants = Straight-debt value of bond + Value of warrants

$$\text{Conversion price} = P_c = \frac{\text{Par value of bond given up}}{\text{Shares received}}$$

$$\text{Conversion ratio} = CR = \frac{\text{Par value of bond given up}}{P_c}$$

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FREQUENTLY USED SYMBOLS/ABBREVIATIONS

ACP	Average collection period
ADR	American depository receipt
APR	Annual percentage rate
A/R	Accounts receivable
b	Beta coefficient, a measure of an asset's riskiness
b_L	Levered beta
b_U	Unlevered beta
BEP	Basic earning power
BVPS	Book value per share
CAPM	Capital Asset Pricing Model
CCC	Cash conversion cycle
CF	Cash flow; CF_t is the cash flow in Period t
CFPS	Cash flow per share
CR	Conversion ratio
CV	Coefficient of variation
D_p	Dividend of preferred stock
D_t	Dividend in Period t
DCF	Discounted cash flow
D/E	Debt-to-equity ratio
DPS	Dividends per share
DRIP	Dividend reinvestment plan
DRP	Default risk premium
DSO	Days sales outstanding
EAR	Effective annual rate, EFF%
EBIT	Earnings before interest and taxes; net operating income
EBITDA	Earnings before interest, taxes, depreciation, and amortization
EPS	Earnings per share
EVA	Economic value added
F	(1) Fixed operating costs (2) Flotation cost
FCF	Free cash flow
FV_N	Future value for Year N
FVA_N	Future value of an annuity for N years
g	Growth rate in earnings, dividends, and stock prices
I	Interest rate; also referred to as r
I/YR	Interest rate key on some calculators
INT	Interest payment in dollars
IP	Inflation premium
IPO	Initial public offering
IRR	Internal rate of return
LP	Liquidity premium
M	Maturity value of a bond
M/B	Market-to-book ratio
MIRR	Modified internal rate of return
MRP	Maturity risk premium
MVA	Market value added
N	Calculator key denoting number of periods
$N(d_i)$	Represents area under a standard normal distribution function
NOPAT	Net operating profit after taxes
NOWC	Net operating working capital
NPV	Net present value
P	(1) Price of a share of stock in Period t; P_0 = price of the stock today (2) Sales price per unit of product sold

P_c	Conversion price
P_f	Price of good in foreign country
P_h	Price of good in home country
P/E	Price/earnings ratio
PMT	Payment of an annuity
PPP	Purchasing power parity
PV	Present value
PVA_N	Present value of an annuity for N years
Q	Quantity produced or sold
Q_{BE}	Breakeven quantity
r	(1) A percentage discount rate, or cost of capital; also referred to as I (2) Nominal risk-adjusted required rate of return
\bar{r}	"r bar," historic, or realized, rate of return
\hat{r}	"r hat," an expected rate of return
r^*	Real risk-free rate of return
r_d	Before-tax cost of debt
r_e	Cost of new common stock (outside equity)
r_f	Interest rate in foreign country
r_h	Interest rate in home country
r_i	Required return for an individual firm or security
r_M	Return for "the market," or an "average" stock
r_{NOM}	Nominal rate of interest; also referred to as I_{NOM}
r_p	(1) Cost of preferred stock (2) Portfolio's return
r_{PER}	Periodic rate of return
r_{RF}	Rate of return on a risk-free security
r_s	(1) Cost of retained earnings (2) Required return on common stock
ρ	Correlation coefficient; also denoted as R when using historical data
ROA	Return on assets
ROE	Return on equity
RP	Risk premium
RP_M	Market risk premium
RR	Retention rate
S	(1) Sales (2) Estimated standard deviation for sample data
SML	Security Market Line
Σ	Summation sign
σ	Standard deviation
σ^2	Variance
t	Time period
T	Marginal income tax rate
TV_N	A stock's horizon, or terminal, value
TIE	Times interest earned
V	Variable cost per unit
V_B	Bond value
V_p	Value of preferred stock
VC	Total variable costs
WACC	Weighted averaged cost of capital
X	Exercise price of option
YTC	Yield to call
YTM	Yield to maturity