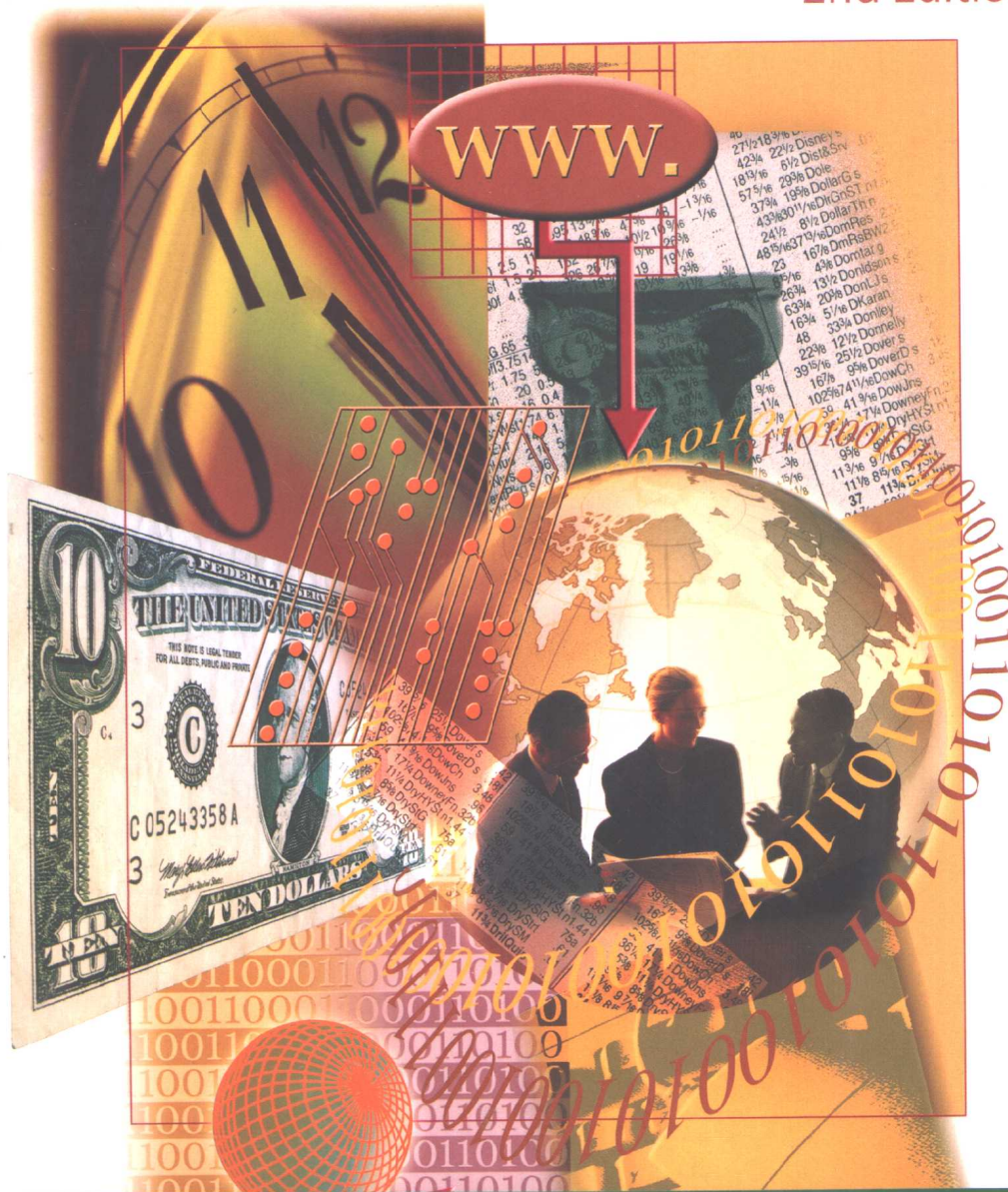


# Financial Markets and Corporate Strategy

2nd Edition



Mark Grinblatt Sheridan Titman

INTERNATIONAL EDITION



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# Financial Markets and Corporate Strategy

Second Edition

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*University of California at Los Angeles*

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*University of Texas—Austin*

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To my dear brother Arnie, for his courage, perseverance, and inspiration.  
M. G.

To my family, for their enduring love and support.  
S. T.

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# Financial Markets and Corporate Strategy



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# About the Authors

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## **Mark Grinblatt, University of California at Los Angeles**

Mark Grinblatt is Professor of Finance at UCLA's Anderson School, where he began his career in 1981 after graduate work at Yale University. He is also a director on the board of Salomon Swapco, Inc., a consultant to numerous firms, and an associate editor of the *Journal of Financial and Quantitative Analysis* and the *Review of Financial Studies*.

From 1987 to 1989, Professor Grinblatt was a visiting professor at the Wharton School, and, while on leave from UCLA in 1989 and 1990, he was a vice-president for Salomon Brothers, Inc., valuing complex derivatives for the fixed income arbitrage trading group in the firm. In 1999 and 2000, Professor Grinblatt was a visiting fellow at Yale's International Center for Finance.

Professor Grinblatt is a noted teacher at UCLA, having been awarded teacher of the year for UCLA's Fully Employed MBA Program by a vote of the students. This award was based on his teaching of a course designed around early drafts of this textbook.

Professor Grinblatt's areas of expertise include investments, performance evaluation of fund managers, fixed income markets, corporate finance, and derivatives.

## **Sheridan Titman, University of Texas—Austin**

Sheridan Titman holds the Walter W. McAllister Centennial Chair in Financial Services at the University of Texas. He is also a research associate of the National Bureau of Economic Research.

Professor Titman began his academic career in 1980 at UCLA, where he served as the department

chair for the finance group and as the vice-chairman of the UCLA management school faculty. He designed executive education programs in corporate financial strategy at UCLA and the Hong Kong University of Science and Technology, based on material developed for this textbook.

In the 1988–89 academic year Professor Titman worked in Washington, D.C., as the special assistant to the Assistant Secretary of the Treasury for Economic Policy, where he analyzed proposed legislation related to the stock and futures markets, leveraged buyouts and takeovers. Between 1992 and 1994, he served as a founding professor of the School of Business and Management at the Hong Kong University of Science and Technology, where his duties included the vice chairmanship of the faculty and chairmanship of the faculty appointments committee. From 1994 to 1997 he was the John J. Collins, S.J. Chair in International Finance at Boston College.

Professor Titman has served on the editorial boards of the leading academic finance journals, was an editor of the *Review of Financial Studies*, and a past director of the American Finance Association and the Western Finance Association. He is the founding managing editor of the *International Review of Finance* and current director of the Asia Pacific Finance Association and the Financial Management Association. He has won a number of awards for his research excellence, including the Battery-march fellowship in 1985, which was given to the most promising assistant professors of finance, and the Smith Breeden prize for the best paper published in the *Journal of Finance* in 1997.



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# Foreword

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After an introduction to corporate finance, students generally experience the subject as fragmenting into a variety of specialized areas, such as investments, derivatives markets, and fixed income, to name a few. What is often overlooked is the opportunity to introduce these topics as integral components of corporate finance and corporate decision making. Before now, it was difficult to convey this important connection between corporate finance and financial markets. By doing just that, this book simultaneously serves as a basis of and a practical reference for all further study and experience in financial management.

The central corporate financial questions address which projects to accept and how to finance them. This text recognizes that to provide a framework to answer these questions, along with the associated issues of corporate finance and corporate strategy that they raise, requires a deep understanding of the financial markets. The book begins by describing the financing instruments available to the firm and how they are priced. It then develops the logic, the models, and the intuitions of modern financial decision making from portfolio theory through options and on to tax effects. The treatment focuses on project evaluation and the uses of capital and financial

structure, and it is enriched with a wealth of real world examples. The questions raised by managerial incentives and differences in the information held by management and the financial markets are also taken up in detail, supplementing the familiar treatment of the tradeoffs between taxes and bankruptcy costs. Lastly, and wholly appropriately, financial decision making is shown to be an essential part of the overall challenge of risk management.

Integrating capital structure and corporate financial decisions with corporate strategy has been a central area of research in finance and economics for the last two decades, and it has clearly changed the way we think about these matters. What is remarkable about this book is that it can take this relatively new material and so comfortably and seamlessly knit it together with more traditional approaches to give the reader such a clear understanding of corporate finance. Anyone who wants to probe more deeply into financial decision making and understand its relation to corporate strategy should read this text. Nor is this a book that will gather dust when the course is over; it will become part of every reader's tool kit and they will turn back to it often. I know that I will.

**Stephen A. Ross**



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# Preface

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Textbooks can influence the lives of people. We know this firsthand. As high school students, each of us read a textbook that ignited our interests in the field of economics. This text, *Economics* by Paul Samuelson, resulted in our separate decisions to study economics in college, which, in turn, led to graduate school in this field. There, each of us had the great fortune to study under some exceptional teachers (including the author of the foreword to this text) who stimulated our interest in finance. Satisfying, rewarding careers have blessed us ever since. To Paul Samuelson and his textbook, we owe a debt of gratitude.

As young assistant professors at UCLA in the early 1980s, we discovered that teaching a comprehensive course in finance could be a valuable way to learn about the field of finance. Our course preparations invariably sparked discussion and debates about points made in the textbooks used to teach our classes, which helped to jumpstart our scholarly writing and professional careers. These discussions and debates eventually evolved into a long-term research collaboration in many areas of finance, reflected in our coauthorship of numerous published research papers over the past two decades and culminating in our ultimate collaboration—this textbook.

We began writing the first edition of this textbook in early 1988. It took almost 10 years to complete this effort because we did not want to write an ordinary textbook. Our goal was to write a book that would break new ground in both the understanding and explanation of finance and its practice. We wanted to write a book that would influence the way people think about, teach, and practice finance. It would be a book that would elevate the level of discussion and analysis in the classroom, in the corporate boardroom, and in the conference rooms of Wall Street firms. We wanted a book that would sit on the shelves of financial executives as a useful reference manual, long after the executives had studied the text and received a degree.

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## About the Second Edition

The success of the first edition of *Financial Markets and Corporate Strategy* was heartening. The market for this text has expanded every year, and it is well known around the world as the cutting-edge textbook in corporate finance. The book is used in a



variety of courses, including both introductory core courses and advanced electives. Some schools have even designed their curricula around this text.

We have developed a second edition based on the comments of many reviewers and colleagues, producing what we think is a more reader-friendly book. The most consistent comment from users of the first edition was a request for a chapter on the key ingredients of valuation: accounting, cash flows, and basic discounting. This ultimately led to an entirely new chapter in the text, Chapter 9. In almost every chapter, examples were updated, vignettes were changed, numbers were modified, statements were checked for currency, clarity, and historical accuracy, and exercises and examples were either modified or expanded. Even the introductions to the various parts of the text were modified. For example, data on capital budgeting techniques in use were liberally sprinkled into the introduction to Part III.

The new edition also includes a number of additions that we hope will broaden its appeal. These include:

- a discussion of Germany's *Neuer Markt*, designed for stocks of new growth companies in Chapter 1
- a discussion of the Internet company boom and bust and the reasons for it in Chapter 3
- a short section on private equity in Chapter 3
- a discussion of the collapse of Long Term Capital Management (LTCM) and the risks associated with arbitrage in Chapter 7
- a discussion about the lessons learned from the fate of LTCM in Chapter 7
- a new section about market frictions and their implications for derivative securities pricing and the management of derivatives portfolios in Chapter 7
- an expanded section on covered interest rate parity in Chapter 8
- more in-depth discussion of the equivalent annual benefit approach in Chapter 10
- an expanded discussion of the distinction between firm betas and project betas, and several new explanations for why these might differ, in Chapter 11
- a discussion of Amgen and why growth companies with near horizon research costs and deferred profitability of projects generated by that research tend to have high betas, in Chapter 11
- an expanded discussion of pitfalls when using comparisons with the risk-adjusted discount rate method in Chapter 11
- a completely fresh approach to the understanding of WACC adjusted cost of capital formulas in Chapter 13
- step-by-step recipes for doing a valuation with the risk-adjusted discount rate method in Chapters 11 and 13
- a rewritten discussion of the tax benefits of internal financing in Chapter 15
- a new section on project financing in Chapter 16
- a revised discussion of the Miller-Rock dividend signalling model in Chapter 19
- an analysis of California's 2000–01 electricity crisis in Chapter 21
- a retrospective on how merger activity has changed since the 1st edition in Chapter 21

With the second edition, and with all future editions, our goal is to make the book ever more practical, pedagogically effective, and current. All suggestions and comments continue to be welcome.



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## The Need for This Text

The changes witnessed since the early 1980s in both the theory of finance and its practice make the pedagogy of finance never more challenging than it is today. Since the early 1980s, the level of sophistication needed by financial managers has increased substantially. Managers now have access to a myriad of financing alternatives as well as futures and other derivative securities that, if used correctly, can increase value and decrease the risk exposure of their firms. Markets have also become more competitive and less forgiving of bad judgment. Although the amount of wealth created in financial markets in these past years has been unprecedented, the wealth lost by finance professionals in a number of serious mishaps has received even more attention.

Today, there is a unique opportunity for the financial manager. Clearly, the returns to having even a slight edge in the ability to evaluate and structure corporate investments and financial securities have never been so high. Yet, while the possibilities seem so great, the world of finance has never seemed so complex.

As our understanding of financial markets has grown more sophisticated, so has the practice of trading and valuing financial securities in these markets. At the same time, our understanding of how corporations can create value through their financial decisions has also advanced, suggesting that financial management is on the verge of a similar transformation to that seen in the financial markets. We believe that successful corporate managers will be those who can take advantage of the growing sophistication of the financial markets. The key to this will be the ability to take the lessons learned from the financial markets and apply them to the world of corporate financial management and strategy. The knowledge and tools that will enable the financial manager to transfer this knowledge from the markets arena to the corporate arena are found within this text.

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## Intended Audience

This book provides an in-depth analysis of financial theory, empirical work, and practice. It is primarily designed as a text for a second course in corporate finance for MBAs and advanced undergraduates. The text can stand alone or in tandem with cases. Because the book is self-contained, we also envision this as a textbook for a first course in finance for highly motivated students with some previous finance background.

The book's applications are intuitive, largely nontechnical, and geared toward helping the corporate manager formulate policies and financial strategies that maximize firm value. However, the formulation of corporate strategy requires an understanding of corporate securities and how they are valued. The depth with which we explore how to value financial securities also makes about half of this book appropriate for the Wall Street professional, including those on the sales and trading side.

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## The Underlying Philosophy

We believe that finance is not a set of topics or a set of formulas. Rather, it is the consistent application of a few sensible rules and themes. We have searched long and hard for the threads that weave finance theory together, on both the corporate and investment side, and have tried to integrate the approach to finance used here by repeating these common rules and themes whenever possible.

A common theme that appears throughout the book is that capital assets must be valued in a way that rules out the possibility of riskless arbitrage. We illustrate how



this powerful assumption can be used both to price financial securities like bonds and options and to evaluate investment projects. To identify whether the pricing of an investment allows one to create wealth, it is generally necessary to construct a portfolio of financial assets that tracks the investment. To understand how to construct such tracking portfolios, a part of the text is devoted to developing the mathematics of portfolios.

A second theme is that financial decisions are interconnected and, therefore, must be incorporated into the overall corporate strategy of the firm. For example, a firm's ability to generate positive net present value projects today depends on its past investment choices as well as its financing choices.

For the most part, the book takes a prescriptive perspective; in other words, it examines how financial decisions should be made to improve firm value. However, the book also takes the descriptive perspective, developing theories that shed light on which financial decisions are made and why, and analyzing the impact of these decisions in financial markets. At times, the book's perspective combines aspects of the descriptive and prescriptive. For example, the text analyzes why top management incentives may differ from value maximization and describes how these incentive problems can bias financial decisions as well as how to use financial contracts to alleviate incentive problems.

This is an up-to-date book, in terms of theoretical developments, empirical results, and practical applications. Our detailed analysis of the debate about the applicability of the CAPM, for example (Chapters 5 and 6), cannot be found in any existing corporate finance text. The same is true of the book's treatment of value management (Chapters 10 and 18), practiced by consulting firms like Stern Stewart and Co., BCG/Holt, and McKinsey and Co.; the text's treatment of hedging with futures contracts and its impact on companies like Metallgesellschaft (Chapter 22); and of its treatment of interest rate risk and its impact on Orange County's bankruptcy (Chapter 23).

## Pedagogical Features

Our goal was to provide a text that is as simple and accessible as possible without superficially glossing over important details. We also wanted a text that would be eminently practical. Practicality is embedded from the start of each chapter, which begins with a **real-world vignette** to motivate the issues in the respective chapter.

As a pedagogical aid to help the reader understand what should be gleaned from each chapter, the vignettes are immediately preceded by a set of **learning objectives**, which itemize the chapter's major lessons that the student should strive to master.

### Learning Objectives

After reading this chapter you should be able to:

1. Describe the types of equity securities a firm can issue.
2. Provide an overview of the operation of secondary markets for equity.
3. Describe the role of institutions in secondary equity markets and in corporate governance.
4. Understand the process of going public.
5. Discuss the concept of informational efficiency.

*Southern Company is one of the largest producers of electricity in the United States. Before 2000, the company was a major player in both the regulated and unregulated electricity markets. On September 27, 2000, Southern Energy, Inc. (since renamed*



The text can provide depth and yet be relatively simple by presenting financial concepts with a series of examples, rather than with algebraic proofs or “black-box” recipes. Virtually every chapter includes numerous **examples** and **case studies**, some hypothetical and some real, that help the student gain insight into some of the most sophisticated realms of financial theory and practice. Our experience is that practice by doing, first while reading and then reinforced by numerous end-of-chapter problems, is the best way to learn new material. We feel it is important for the student to work through the examples and case studies. They are key ingredients of the pedagogy of this text.

#### Example 11.3: Finding a Comparison Firm from a Portfolio of Firms

Assume that AOL-Time Warner is interested in acquiring the ABC television network from Disney. It has estimated the expected incremental future cash flows from acquiring ABC and desires an appropriate beta in order to compute a discount rate to value those cash flows. However, the two major networks that are most comparable, NBC and CBS, are owned by General Electric and Viacom—respectively—which have substantial cash flows from other sources. For these comparison firms, the table below presents hypothetical equity betas, debt to asset ratios, and the ratios of the market values of the network assets to all assets:

$$\beta_E = \frac{D}{D + E} \frac{\text{Network Assets}}{\text{All Assets}} = \frac{N}{A}$$

#### Amgen's Beta and the Discount Rate for Its Projects: The Perils of Negative Cash Flows

Amgen Corporation is a biotechnology company. As of spring 2001, it was selling three drugs and had a market capitalization of about \$70 billion. Each of Amgen's projects requires substantial R&D that is not expected to generate profits for many years. A typical project tends to generate substantial negative cash flows in its initial years after inception and significant positive cash flows in the far-distant future as the drug developed from the project's R&D efforts is sold. Although the positive cash flows depend on the success of early research and clinical trials, assume for the moment that these cash flows are certain. In this case, the future cash flows of any one of Amgen's projects can be tracked by a short position in short-term debt, which has a beta close to zero, and a long position in long-term default-free debt, such as government-backed zero-coupon bonds with maturities from 10 to 30 years. Such long-term bonds have positive but modest betas, as discussed earlier in this chapter. It is useful to think of the negative cash flows that arise early in the life of the project as leverage generated by short-term debt and the positive cash flows that arise later as the payoff to the long-term debt.

In addition to the numerous examples and cases interwoven throughout the text, we highlight **major results** and define **key words and concepts** throughout each chapter. The **functional use of color** is deliberately and carefully done to call out what is important.

Example 12.5 illustrates the following point:

#### Result 12.4

Most projects can be viewed as a set of mutually exclusive projects. For example, taking the project today is one project, waiting to take the project next year is another project, and waiting three years is yet another project. Firms may pass up the first project, that is, forego the capital investment immediately, even if doing so has a positive net present value. They will do so if the mutually exclusive alternative, waiting to invest, has a higher *NPV*.



At the end of each of the six parts of the book are two unique features. The first is **Practical Insights**, a feature that contains unique guidelines to help the reader identify the important practical issues faced by the financial manager and where to look in that part of the text to help analyze those issues. The feature enables the book to serve as a reference as well as a primer on finance.

*Practical Insights* is organized around what we consider the four basic tasks of financial managers: allocating capital for real investment, financing the firm, knowing whether and how to hedge risk, and allocating funds for financial investments. For each of these functional tasks, *Practical Insights* provides a list of important practical lessons, each bulleted, with section number references which the reader can refer to for further detail on the insight.

### PRACTICAL INSIGHTS FOR PART II

#### Allocating Capital for Real Investment

- Mean-variance analysis can help determine the risk implications of product mixes, mergers and acquisitions, and carve-outs. This requires thinking about the mix of real assets as a portfolio. (Section 4.6)
- Theories to value real assets identify the types of risk that determine discount rates. Most valuation problems will use either the CAPM or APT, which identify market risk and factor risk, respectively, as the relevant risk attributes. (Sections 5.8, 6.10)
- An investment's covariance with other investments is a more important determinant of its discount rate than is the variance of the investment's return. (Section 5.7)
- The CAPM and the APT both suggest that the rate of return required to induce investors to hold an

- Portfolio mathematics can enable the investor to understand the risk attributes of any mix of real asset financial assets, and liabilities. (Section 4.6)
- Forward currency rates can be inferred from domestic and foreign interest rates. (Section 7.2)

#### Allocating Funds for Financial Investments

- Portfolios generally dominate individual securities as desirable investment positions. (Section 5.2)
- Per dollar invested, leveraged positions are riskier than unleveraged positions. (Section 4.7)
- There is a unique optimal risky portfolio when a risk-free asset exists. The task of an investor is to identify this portfolio. (Section 5.4)

The second feature, **Executive Perspective**, provides the reader with testimonials from important financial executives who have looked over respective parts of the book and highlight what issues and topics are especially important from the practicing executive's perspective.

### EXECUTIVE PERSPECTIVE

Myron S. Scholes

For large financial institutions, financial models are critical to their continuing success. Since they are liability as well as asset managers, models are crucial in pricing and evaluating investment choices and in managing the risk of their positions. Indeed, financial models, similar to those developed in Part II of this text, are in everyday use in these firms.

The mean-variance model, developed in Chapters 4 and 5, is one example of a model that we use in our activities. We use it and stress management technology to optimize the expected returns on our portfolio subject to risk, concentration, and liquidity constraints. The mean-variance approach has influenced financial institutions in determining risk limits and measuring the sensitivity of their profit and loss to systematic exposures.

and equity factor models—extremely important tools to determine appropriate hedges to mitigate factor risk. For example, my former employer, Salomon Brothers, used factor models to determine the appropriate hedges for equity and debt positions.

All this pales, of course, with the impact of derivative valuation models, starting with the Black-Scholes option pricing model that I developed with Fischer Black in the early 1970s. Using the option-pricing technology, investment banks have been able to produce products that customers want. An entire field called financial engineering has emerged in recent years to support these developments. Investment banks use option pricing technology to design sophisticated contracts and to determine the appropriate hedges to mitigate the underlying risks of producing



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## Organization of the Text

Part I opens the text with a description of the capital markets: the various financial instruments and the markets in which they trade. Part II develops the major financial theories that explain how to value these financial instruments, while Part III examines how these same theories can be used by corporations to evaluate their real investments in property, plant, and equipment, as well as investments in nonphysical capital like research and human capital. Parts IV, V, and VI look at how the modern corporation interacts with the capital markets. The chapters in these parts explore how firms choose between the various instruments available to them for financing their operations and how these same instruments help firms manage their risks. These corporate financial decisions are not viewed in isolation, but rather, are viewed as part of the overall corporate strategy of firms, affecting their real investment and operating strategies, their product market strategies, and the ways in which their executives are compensated.

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This book could not have been produced without the help of many people. First, we are grateful to the two special women in our lives, Rena Repetti and Meg Titman, for their support. They also provided great advice and comments on critical issues and parts of the book over the years. And of course, we are grateful for the five children that have blessed our two families. They are the inspiration for everything we do.

A number of people wrote exceptional material for this book. Stephen Ross wrote a terrific foreword and provided comments on many key chapters. Rob Brokaw, Thomas Copeland, Lisa Price, Myron Scholes, David Shimko, and Bruce Tuckman were extremely gracious in taking the time to read chapters of the book, provide comments, and write insightful Executive Perspectives for the first edition. Dennis Sheehan prepared material on financial institutions, much of which was worked into Chapters 1 through 3. Jim Angel prepared material on accounting, some of which was worked into Chapter 9 and participated in updating Chapter 1 for the second edition.

We received exceptional detailed comments on earlier drafts of all 23 chapters from a number of scholars who were selected by the editors at McGraw-Hill/Irwin. They went far beyond the call of duty in shaping this book into a high-quality product. We owe gratitude to the following reviewers:

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## Concluding Remarks

Although we have taken great care to discover and eliminate errors and inconsistencies in this text, we understand that this text is far from perfect. Our goal is to continually improve the text. Please let us know if you discover any errors in the book or if you have any good examples, problems, or just better ways to present some of the existing material. We welcome your comments (c/o McGraw-Hill/Irwin Editorial, 1333 Burr Ridge Parkway, Burr Ridge, IL 60521).

Mark Grinblatt  
Sheridan Titman



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