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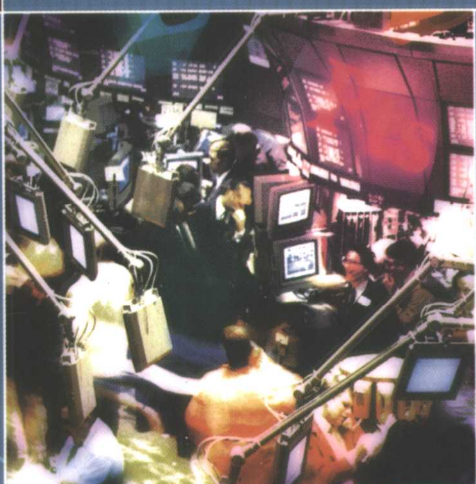
影印版

Finance



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出版前言

为适应经济社会发展的需要，以高质量的高等教育迎接经济全球化和新科技革命的挑战，培养数以千万计的高质量专门人才，教育部明确要求各高等院校创造条件使用英语等外语进行公共课和专业课教学，从而缩短我国在有关专业教学上与国际先进水平的差距，同时不断提升我国大学生的外语水平。其中一个重要的措施是在高等学校推动使用外语优秀教材。

为使高校学生能够及时使用世界先进水平的经济管理类新教材，高等教育出版社受教育部高教司委托，聘请熟悉国内外教学和学科发展水平的专家，从欧美现行教材中遴选、引进了这批具有国际领先水准的英文版教材，以影印形式出版，供开设相应课程的高等学校选用。

引进这批教材时，遴选和评定的依据主要有以下几个方面：（1）引进的教材与 1998 年教育部颁行的专业目录及后来批准的目录外专业所规定的主要课程相对应，内容符合专业培养目标和教学要求。（2）版本要新。国外的大学教科书一般三年左右即修订再版一次，增补新的内容。这批教材选择的都是国外权威教科书的最新版本，内容涵盖了相应学科最新进展的介绍和现实案例的分析。（3）内容规范简明，适合教学。由于这批影印教材主要是针对我国大学本科层次经济管理类专业的基础课程和主干课程的，专家们在选择时充分考虑了内容的严谨、规范以及表述的准确性，同时考虑了使用外语教材可能遇到的课时限制问题，在内容相同的几种流行版本中选择相对简明的薄本。另外，按照教育部的要求，这批教材的定价采取了与国内版教材相同的标准。

由于这批教材的作者所在国家的经济、政治、社会文化等与我国均有所不同，书中内容和观点难免有偏颇和错误之处，希望读者在阅读时注意鉴别。

我们希望这批影印教材的出版，对各高等院校的经济管理类专业的教学有所促进和帮助。

高等教育出版社

2002 年 9 月

Foreword

Every year dozens of new textbooks are published. No wonder. As Willie Sutton told the judge about why he robbed banks: "That's where the money is." But only every other decade does there arrive an innovative new work that sets a new pattern of excellence and pedagogy. This Bodie-Merton *Finance* has long been expected. And it proves to be well worth the wait. Good teachability, like good wine, requires much deliberate time.

In the meanwhile, Robert Merton shared the 1997 Nobel Prize in Economics. His was never a case of "if" but only a case of "when," for it has been well said that Merton is the Isaac Newton of modern finance theory. And ever since their graduate student days at MIT, Bodie and Merton have made a productive team. Speaking as one of their teachers, I hail their demonstrating that water can indeed rise above its source. The kind of finance that matters for modern experts goes beyond the tools that have been revolutionizing Wall Street: the pricing of options and other contingent derivatives. Yes, all that is important practically and theoretically. But as this book's coverage shows, it is the Main Street economy of production, capital budgeting, personal finance, and rational accounting that is best illuminated by this overdue breakthrough in teaching.

I moan to myself, "Where were these authors back when I was a student?" Well, the future is longer than the past, and future students will reap the harvest that these innovative teachers have sown.

Enjoy!

Paul A Samuelson

Paul A. Samuelson
Massachusetts Institute of Technology

Preface

Finance is an introductory text intended for use in the first course. It has a broader scope and a greater emphasis on general principles than most other introductory-level texts in finance, which typically focus exclusively on corporate finance. The preliminary edition of this text, which was published in September 1997, has also proven to be well suited for students of economics, law, mathematics and for business executives seeking a solid understanding and overview of the entire field of finance.

SCOPE OF THE TEXT

In most well-developed fields of study, such as chemistry, the educational norm is for the introductory course to cover general principles and to give the student an appreciation of the scope of the whole discipline's subject matter. It thereby lays the foundation for more specialized courses that have a narrower focus, such as organic or inorganic chemistry. In line with this approach, our text encompasses all of the subfields of finance—corporate finance, investments, and financial institutions—within a single unifying conceptual framework.

CONTENT AND ORGANIZATION

Finance as a scientific discipline is the study of how to allocate scarce resources over time under conditions of uncertainty. There are three analytical "pillars" to finance: optimization over time (the analysis of intertemporal trade-offs), asset valuation, and risk management (including portfolio theory). At the core of each of these pillars are a few basic laws and principles that apply across all of the topical subfields.

The book is divided into six major parts. Part I explains what finance is, gives an overview of the financial system, and reviews the structure and uses of corporate financial statements. Parts II, III, and IV correspond to each of the three conceptual pillars of finance and emphasize the application of finance principles to decision problems faced by households (life-cycle financial planning and investments) and firms (capital budgeting). Part V covers the theory and practice of asset pricing. It explains the Capital Asset Pricing Model, and the pricing of futures, options, and other contingent claims, such as risky corporate debt, loan guarantees, and levered equity. Part VI deals with issues in corporate finance: capital structure, mergers and acquisitions, and real options analysis of investment opportunities.

Finance is intended for use in its current form anywhere in the world. The book is written so that its concepts are as relevant and understandable to a student in Argentina, France, Japan, or China as they are to a student in the United States. The international aspects of finance are integrated throughout the book, not confined to specific, separate "international" chapters.

PEDAGOGICAL FEATURES

- There are many *examples* to illustrate theory at work in making financial decisions.
- There are "Quick Check" *concept questions* at critical points in the text to help students check their understanding of the material just presented. Answers to these questions are provided at the end of the chapter.
- There are *special-interest boxes* inserted throughout the text containing newspaper clippings and applications that encourage students to make active use of the theory in dealing with their own affairs and in interpreting the financial news.
- There are a large number of end-of-chapter *problems*, sorted by topic and level of difficulty. Complete step-by-step solutions for all problems are provided in the *Instructor's Manual* in a format that allows adopters of the text to distribute them to their students.

TEMPLATE
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- A special set of spreadsheet templates, which correspond with selected end-of-chapter problems, was created by Craig Holden of Indiana University to accompany this textbook. They are contained on the Prentice Hall Finance Center CD-ROM found in the inside back cover of each copy of the text.

E-BOOK
x.x

- E-book icons, found adjacent to selected headings in the text, refer to the Spreadsheet Modeling Exercises Handbook. This handbook contains 19 models that demonstrate how students can build their own Excel spreadsheet models. The exercises guide the reader step-by-step through the implementation of models designed to teach the applied aspects of finance. The end result of each exercise is the production of an Excel template that can be used repeatedly to implement models of professional quality for financial forecasting, discounted-cash-flow valuation, option pricing, and more. These same templates were used to create the numerical examples in the textbook itself. The Spreadsheet Modeling Student Handbook is included on the Finance Center CD.

FLEXIBILITY

The text is organized in a way that readily permits an instructor teaching a traditional introductory course in corporate or managerial finance to adopt the book. However, for schools that are currently updating their finance curriculum to reflect advances in the theory and practice of finance, *Finance* provides a flexible alternative to the traditional introductory text. Instead of focusing exclusively on corporate finance, it teaches the conceptual building blocks and applied techniques that are required in *all* areas of finance—investments and financial institutions, as well as corporate finance. Consequently, instructors in subsequent elective courses do not have to develop these fundamentals from scratch, as is often the case now. *Finance*'s broad-based approach thereby eliminates considerable duplication of effort in the elective offerings.

The text is organized to allow instructors considerable latitude in choosing the content and level of detail they wish to deliver to their classes.

One outcome of this flexible structure is that an instructor who wishes to emphasize corporate finance in the introductory course can focus on chapters 3, 6, 13, 16, and 17 and still provide effective coverage of general valuation and risk management by using selected chapters from Parts III and IV. Instructors who instead wish to emphasize investment subjects such as portfolio selection and option pricing in the introductory course can readily do so by covering more chapters from Parts IV and V.

REQUIRED LEVEL OF MATHEMATICS

The level of mathematical sophistication required to understand the text is elementary algebra. We provide many algebraic models in the text, which serve as the foundation for spreadsheet modeling.

SUPPLEMENTS FOR THE INSTRUCTOR

Instructor's Manual with Solutions

The Instructor's Manual includes worked out answers to *all* end-of-chapter questions and problems.

Instructor's Resource CD

This CD, included in every copy of the Instructor's Manual, contains a PowerPoint Lecture Presentation of over 2,000 slides with numerous graphs, tables, and equations as well as an abridged version of approximately 40 slides per chapter with outlines and graphs. The CD also contains the complete Excel program specifically designed for this text by Craig Holden: Excel templates and solutions for selected end-of-chapter problems, the Spreadsheet Modeling Exercises Handbook, and the worked out answers to the modeling exercises.

Test Bank

Written by Bonnie Buchanan of Georgia State University, the test bank contains approximately 1,000 multiple-choice questions, short-answer problems, and a separate section with more analytical, challenging problems.

Test Manager

The new Version 4.1 computerized test bank has added database capabilities. Instructors can store students' grades, export grades to Excel, and archive previous semester grade statistics.

FINCOACH Test Manager and FINCOACH Instructor's Manual

Test Manager software has been developed to allow instructors to generate tests based on FINCOACH—The Financial Management Math Practice Program contained within the Prentice Hall Finance Center CD available to all students using *Finance*. In addition, an Instructor's Manual for using FINCOACH Test Manager and FINCOACH in the course has been developed and is included with the FINCOACH Test Manager software.

PHLIP/CW: Prentice Hall's Learning on the Internet Partnership/Companion Web Site (www.prenhall.com/bodie)

Prentice Hall's Learning on the Internet Partnership/Companion Web site is a content-rich, multidisciplinary business Web site with Internet exercises, activities, and resources related to a specific text. All Internet resources are updated every two weeks, allowing both instructors and students to use a wealth of up-to-date, on-line resources. Instructors will need to acquire a password and user ID code from their local Prentice Hall representative in order to open the faculty site and gain access to the following materials.

- **Downloadable supplements,** including Instructor's Manuals, PowerPoint presentations, and Excel spreadsheet solutions, for selected end-of-chapter problems.
- **On-line faculty support** with additional cases, current event articles, links, and full support for exercises posted on the Student Page.

Visit the Faculty Lounge area to find:

- Talk to Team—Faculty chat room
- Teaching Archive—Resources for enhancing lecture materials and doing research on the Web
- Help with Computers—Provides tips and access to getting answers to tricky computer problems

Companion Web Site (www.prenhall.com/bodie)

Companion Web sites provide an interactive learning environment for students, and supply support resources for instructors. Among other resources, every Companion Web site integrates Syllabus Manager™, an on-line syllabus creation and management utility. Syllabus Manager™ provides instructors with an easy, step-by-step process to create and revise syllabi, with direct links into Companion Web site and other on-line content. Students access Syllabus Manager™ directly from within the Companion Web site, providing quick access to course assignments. The Companion Web site for *Finance* contains sample syllabi created using Syllabus Manager™.

FOR THE STUDENT

The Prentice Hall Finance Center CD

Contained in the inside back cover of *Finance* is the *Prentice Hall Finance Center CD.* This all-in-one robust learning tool contains features designed to increase student awareness of what finance professionals do, ensure comprehension and mastery of the financial mathematics contained in the text, provide help for students in building their own Excel spreadsheets, and provide a direct link to PHLIP (Prentice Hall Learning on the Internet Partnership).

Specifically, the following dynamic tools are found on the Prentice Hall Finance Center CD.

- ***Careers Center.*** Introduces the student to a vast array of professional opportunities in finance through video interviews with professionals and insights into what they do on the job on an average day. Here the student will meet an options trader, a mutual fund manager, investment analysts, a CFO, and others. Also accessible are features for personal development, résumé writing, interviewing techniques, and career planning information.

- ***FINCOACH—The Financial Math Practice Center.*** Contains more than 5 million problems and self-tests in virtually all math areas covered in this text. Save problems, review them, and print them. This is a step-by-step guide to solve any finance mathematics problem and allows the student to rapidly gain mastery in all mathematical challenges.
- ***PHLIP—Principles and Practice Web Center.*** PHLIP (Prentice Hall Learning on the Internet Partnership) can be accessed either directly from the CD or remotely at *http://www.prenhall.com/bodie.* Here's what the student can do on PHLIP:
  - See current news items from the popular business press and directly related to individual chapters. These news items use chapter terminology, provide links to related information, and offer discussion questions and projects for assignment by the instructor.
  - Access additional career information.
  - Learn study and writing skills and engage in conferences with other students studying finance.
  - Access to a free on-line study guide specifically designed for the text
- ***Spreadsheet Modeling Exercises.*** Spreadsheet modeling is a core skill for real-world finance. Employers want individuals who both understand finance models and can implement them on a spreadsheet. The Spreadsheet Modeling Exercises section of the Prentice Hall Finance Center CD was created by Dr. Craig W. Holden of Indiana University. This dynamic educational tool is based on a hands-on, active-learning paradigm. Starting with a blank spreadsheet, the student follows complete user-friendly instructions and builds spreadsheet models in 30 to 60 minutes. Excel screen shots show what the completed spreadsheet will look like. Each exercise contains two levels: 1) "How to Build Your Own Spreadsheet Model," and 2) "Using the Power of Your Spreadsheet Model," which extends the model to an advanced level. Every important quantitative model in *Finance* is covered. Templates for problems at the end of each chapter are also provided.
- ***Companion Web site.*** The Companion Web site includes a free on-line study guide that provides various self-assessment exercises and immediate feedback for the student.

CHANGES SINCE THE PRELIMINARY EDITION

In September 1997 Prentice Hall published a preliminary edition of this text with the intention of getting extensive feedback from teachers of finance and other reviewers. To our delight, several universities adopted the preliminary edition, and we were therefore able to benefit from their experiences with it. Here is what we learned from these class testers of the preliminary edition and the way we have responded in this first edition:

- Students liked the emphasis on practical financial decision making, especially the examples drawn from personal finance. We have therefore reorganized the old chapters 4 and 5. The revised chapter 5, Life-Cycle Financial Planning, is now a self-contained primer in personal financial decision making, using time value of money concepts in making saving, borrowing, and investment decisions over the life cycle.

- Readers liked chapter 3 on financial statements, but many thought that it is best to cover financial forecasting and working capital (the old chapter 19) as part of the same unit. In the first edition, these two chapters have been combined into a single revised chapter 3, How to Interpret and Forecast Financial Statements. This is a self-contained primer that requires no prior knowledge of accounting.
- In response to faculty reviewer comments, coverage of corporate finance topics is significantly expanded in the first edition. As already noted, management of working capital and the construction of pro forma statements for forecasting have been incorporated into an expanded chapter 3 on financial statements. Chapter 6, on capital budgeting, now contains a detailed spreadsheet analysis of an investment project, including the calculation of expected cash flows and sensitivity analysis of NPV. This same project appears in the Spreadsheet Modeling Exercises Handbook with step-by-step instructions on how to build the model and to carry out sensitivity analyses using Excel. Chapter 16 now contains the APV, FTE, and WACC approaches to integrating financing considerations into the capital budgeting decision. A detailed analysis and illustration compares the three approaches and demonstrates their mutual consistency. Furthermore, chapter 16 has added a detailed discussion of how a firm's financing mix is chosen in the real world, underscored with several concrete examples.
- In general, reviewers found the second half of the preliminary edition to be more difficult to understand than the first half. We have therefore made the first edition flow more evenly by simplifying the second half, and reviewers of the revised text have unanimously praised the results of that effort. For example, we have simplified and streamlined the presentation of options and contingent claims. Instead of separate chapters on each, there is now a single revised chapter 15, Options and Contingent Claims, and it is full of practical examples of how options and option-pricing concepts can be applied. We have also combined the old chapters 11 and parts of 12 into a single chapter 11, Hedging, Insuring, and Diversifying, to allow more instructors to fit these risk management topics into the introductory course.
- As a result of messages received from several careful readers, we have corrected a number of typographical and numerical errors that crept into the preliminary edition. Nonetheless, despite these efforts, this first edition will almost surely contain some errors, and we ask your help in identifying them. We are committed to correcting all errors as soon as they are discovered. Please notify the authors directly by email sent to zbodie@bu.edu or rmerton@hbs.edu.

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vided by the Project for the two of us to be located together at the Business School during some critical years in the book's formulation.

From the earliest stages, many experienced teachers of finance were involved in the development of this text. They provided feedback and suggestions which were critical to the book's current form and content. We especially thank Craig Holden of Indiana University, expert extraordinaire, who first helped us to design the Excel spreadsheet exercises that accompany the text, and who then, single-handedly, turned that design into a reality. We would like to offer our special thanks to the following colleagues who reviewed the manuscript in whole or in part: Jack Aber (Boston University), James Angel (Georgetown University), Dean Baim (Pepperdine University), Susan Belden (University of Colorado, Colorado Springs), Marc Bertoneche (University of Bordeaux), Paul Bursick (St. Norbert College), George Chacko (Harvard Business School), Ted Chadwick (Boston University), Joseph Cherian (Boston University), William W. Damon (Vanderbilt University), Richard DeFusco (University of Nebraska–Lincoln), Michael Dowd (University of Toledo), Rex DuPont (Boston University), Steven Feinstein (Babson College), Michael Fishman (Northwestern University), Frederick Floss (SUNY Buffalo), Micah Frankel (California State University–Hayward), Thomas Gefzey (Temple University), Raymond Gorman (Miami University of Ohio), Kathryn Griner (Boston University), R. W. Hafer (Southern Illinois University at Edwardsville), Sam Hanna (Boston University), Rex Daniel Harawa (SUNY Geneseo), Craig Holden (Indiana University), Keith Howe (De Paul University), Steve Johnson (University of Texas–El Paso), Elizabeth Sawyer Kelly (University of Wisconsin–Madison), W. Carl Kester (Harvard Business School), Brian Kluger (University of Cincinnati), Glen Larson, Jr. (Univeristy of Tulsa), Jaewoo Lee (University of California at Irvine), Robert Lutz (Weber State University), Matthew Malone (Boston University), Surendra Mansinghka (San Francisco State University), J. Harold McClure (University College–Dublin), Bruce McManis (Nicholls State University), Joseph Messian (San Francisco State University), Lisa Meulbroek (Harvard Business School), John Mitchell (Central Michigan University), Karlyn Mitchell (North Carolina State University), Mark Mitchell (University of Chicago/Harvard Business School), Shahruz Mohtadi (Suffolk University), L. W. Murray (University of San Francisco), Paul Natke (CMU), David Nickerson (American University), John Norstad (Northwestern University), Akorlie Nyatepe-Coo (University of Wisconsin–La Crosse), Coleen Pantalone (Northeastern), George Pennacchi (University of Illinois Urbana-Champaign), Lynn Pi (California State University), Rose Prasad (Central Michigan University), Charles Rayhorn (Northern Michigan University), Asani Sarkar (University of Illinois Urbana-Champaign), Dennis Sheehan (Penn State University), Clemens Sialm (Stanford University), Wonhi Synn (Elon College), Harold Tamule (Providence College), Manuel Tarrazo (University of San Francisco), Peter Tufano (Harvard Business School), S. Venkataraman (Univeristy of Florida), Joseph Walker (University of Alabama–Birmingham), and Laura Wolff (Southern Illinois University).

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