Second Edition

Fundamentals of Corporate Finance

Stephen A. Ross

Randolph W. Westerfield

Bradford D. Jordan

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IRWIN

Burr Ridge, Illinois
Boston, Massachusetts
Sydney, Australia

Executive editor: Michael W. Junior
Sponsoring editor: Joanne Dorff
Marketing manager: Ron Bloecher
Project editor: Gladys True
Production manager: Bette K. Ittersagen
Cover and interior design: Jeanne Calabrese
Cover, part, and chapter illustrations: Thomas Hennessy
Art manager: Kim Meriwether
Compositor: Beacon Graphics Corp.
Typeface: 10/12 Times Roman
Printer: Von Hoffmann Press

Library of Congress Cataloging-in-Publication Data

Ross, Stephen A.
Fundamentals of corporate finance/Stephen A. Ross, Randolph W. Westerfield, Bradford D. Jordan—2nd. ed.
p. cm.—(The Irwin series in finance)
Includes index.
ISBN 0-256-11113-8.—ISBN 0-256-12873-1 (International ed.)
1. Corporations—Finance. I. Westerfield, Randolph. II. Jordan, Bradford D. III. Title. IV. Series
HG4026.R677 1993
658.15—dc20

92–28101

Printed in the United States of America
3 4 5 6 7 8 9 0 VH 9 8 7 6 5 4 3

To our families and friends with love and gratitude.

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

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About the Authors

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Stephen Ross has held the position of Sterling Professor of Economics and Finance at Yale University since 1985. One of the most widely published authors in finance and economics, Professor Ross is recognized for his work in developing the Arbitrage Pricing Theory. He has also made substantial contributions to the discipline through his research in signalling, agency theory, options, and the theory of the term structure of interest rates. Previously the president of the American Finance Association, he serves as an associate editor of the *Journal of Finance* and the *Journal of Economic Theory*. He is co-chairman of Roll and Ross Asset Management Corporation.

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Dr. Westerfield came to USC from the Wharton School, University of Pennsylvania, where he was Chairman of the Finance Department and Senior Research Associate at the Rodney L. White Center for Financial Research. For three consecutive years, the Wharton Student Committee on Undergraduate Teaching Evaluation awarded him the highest score for teaching undergraduate finance.

His research interests are in corporate financial policy, investment management and analysis, mergers and acquisitions, and pension fund management. Dr. Westerfield has served as a member of the Continental Bank (Philadelphia) trust committee. He has also been a consultant to a number of corporations, including AT&T, Mobil Oil Corp., and Westinghouse, as well as to the United Nations and the U.S. Departments of Justice and Labor. Dr. Westerfield is the author of more than 30 monographs and articles.

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Bradford Jordan is Associate Professor of Finance at the University of Missouri. He has a longstanding interest in both applied and theoretical issues in corporate finance, and he has extensive experience teaching all levels of corporate finance and financial management policy. Professor Jordan has published numerous articles on issues such as cost of capital, capital structure, and the behavior of security prices. He currently is a director of the Southern Finance Association, and he is Ph.D. Coordinator for the Finance Department at the University of Missouri.

Note from the Editor

"Statistics are no substitute for judgment."
Henry Clay

I wanted to be a manager, but I never wanted to be a financial manager. After all, I was going to be an editor. Let someone else worry about the numbers.

When I took this course, the book I used only served to reinforce these opinions. It dragged me through an endless, detached set of equations and computations, never linking the various components together. I had no chance to discover what I know today: finance is an intriguing subject that influences virtually every business decision made by all managers—even editors.

By selecting *Fundamentals of Corporate Finance,* your professor has demonstrated a genuine interest in your future as a manager. The topics covered in this book are linked to one another and to the other subject areas you are studying. Instructors worldwide have recognized the benefit of assigning this text. It not only provides you with the underlying principles and how they fit together; it supplies a basic logic for financial decision making.

Although there are many factors contributing to the popularity of *Fundamentals of Corporate Finance,* the considerable emphasis placed on managerial judgment has been frequently proclaimed a favorite. The authors continually reinforce the message that as decision makers we must make informed judgments, not simply calculate solutions by filling in missing variables in distinct and unrelated formulas. Few real-world finance issues have tailor-made equations where plug and chug is the only job at hand.

The formulas and equations found in this book are extremely valuable in helping a manager make correct decisions; however, it is you, the manager, who must determine the inputs that make these techniques invaluable. After studying *Fundamentals of Corporate Finance,* you will be prepared to face dynamic managerial challenges as you strive to make the best decisions.

Michael W. Junior

In the 1990s, the challenge of financial management is greater than ever. The previous decade brought fundamental changes in financial markets and instruments, and the practice of corporate finance continues to evolve rapidly. Often, what was yesterday's state of the art is commonplace today, and it is essential that our finance courses and finance texts do not get left behind. *Fundamentals of Corporate Finance* provides what we believe is a modern, unified treatment of financial management that is suitable for beginning students.

The Underlying Philosophy

Rapid and extensive changes place new burdens on the teaching of corporate finance. On the one hand, it is much more difficult to keep materials up to date. On the other, the permanent must be distinguished from the temporary to avoid following what is merely the latest fad. Our solution is to stress the modern fundamentals of finance and to make the subject come alive with contemporary examples. As we emphasize throughout this book, we view the subject of corporate finance as the working of a small number of integrated and very powerful intuitions.

From our survey of existing introductory textbooks, including the ones we have used, this commonsense approach seems to be the exception rather than the rule. All too often, the beginning student views corporate finance as a collection of unrelated topics which are unified by virtue of being bound together between the covers of one book. In many cases, this perception is only natural because the subject is treated in a way that is both topic oriented and procedural. Commonly, emphasis is placed on detailed and specific "solutions" to certain narrowly posed problems. How often have we heard students exclaim that they could solve a particular problem if only they knew which formula to use?

We think this approach misses the forest for the trees. As time passes, the details fade, and what remains, if we are successful, is a sound grasp of the underlying principles. This is why our overriding concern, from the first page to the last, is with the basic logic of financial decision making.

Distinctive Features

Our general philosophy is apparent in the following ways:

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

A Unified Valuation Approach Many texts pay only lip service to net present value (NPV) as the basic concept of corporate finance and stop short of consistently integrating this important principle. The most basic notion, that NPV represents the excess of market value over cost, tends to get lost in an overly mechanical approach to NPV that emphasizes computation at the expense of understanding. Every subject covered in *Fundamentals of Corporate Finance* is firmly rooted in valuation, and care is taken throughout to explain how particular decisions have valuation effects.

A Managerial Focus Students won't lose sight of the fact that financial management concerns *management.* Throughout the text, the role of the financial manager as decision maker is emphasized, and the need for managerial input and judgment is stressed. "Black box" approaches to finance are consciously avoided.

In *Fundamentals of Corporate Finance,* these three themes work together to provide consistent treatment, a sound foundation, and a practical, workable understanding of how to evaluate financial decisions.

Intended Audience

This text is designed and developed explicitly for a first course in business or corporate finance. The typical student will not have previously taken a course in finance, and no previous knowledge of finance is assumed. Since this course is frequently part of a common business core, the text is intended for majors and nonmajors alike. In terms of background or prerequisites, the book is nearly self-contained. Some familiarity with basic accounting principles is assumed, but even these are reviewed very early on. The only other tool the student needs is basic algebra. As a result, students with very different backgrounds will find the text very accessible.

Coverage

From the start, *Fundamentals of Corporate Finance* contains innovative coverage on a wide variety of subjects. For example, Chapter 4, on long-term financial planning, contains a thorough discussion of the sustainable growth rate as a planning tool. Chapter 9, on project analysis and evaluation, contains an extensive discussion of how to evaluate NPV estimates. Chapter 10, on capital market history, discusses in detail the famous Ibbotson-Sinquefield study and the nature of capital market risks and returns. Chapter 13, on selling securities to the public, contains a modern, up-to-date discussion of IPOs and the costs of going public.

This is just a sampling. Because *Fundamentals of Corporate Finance* is not a "me-too" book, we have taken a very close look at what is likely to be relevant in the 1990s, and we have taken a fresh, modern approach to many traditional subjects. In doing so, we eliminated topics of dubious relevance, downplayed purely theoretical issues, and minimized the use of extensive and elaborate computations to illustrate points that are either intuitively obvious or of limited practical use.

Unlike virtually any other introductory text, *Fundamentals of Corporate Finance* provides extensive real-world practical advice and guidance. We try to go beyond just presenting dry, standard textbook material to show how to actually *use* the tools discussed in the text. When necessary, the approximate, pragmatic nature of some types of financial analysis is made explicit, possible pitfalls are described, and limitations are outlined.

Attention to Pedagogy

In addition to illustrating pertinent concepts and presenting up-to-date coverage, *Fundamentals of Corporate Finance* strives to present the material in a way that makes it coherent and easy to understand. To meet the varied needs of its intended audience, *Fundamentals of Corporate Finance* is rich in valuable learning tools, including:

Extensive Examples, Questions, and Problems

1. *Examples.* Every chapter contains a variety of detailed, worked-out examples. These examples are found both in the main body of the text and separately as numbered examples that correspond to the main text. Based on our classroom testing, these examples are among the most useful learnings aids because they provide both detail and explanation.
2. *Concept Questions.* Chapter sections are kept relatively short and are followed by a series of concept questions that provide a quick check concerning the material just covered. Because they highlight key concepts, we have found that students rely heavily on them when reviewing chapter material.
3. *Self-Test Questions.* At the end of each chapter, comprehensive self-test questions appear. They are followed by detailed solutions (with final answers shown in green) and comments on the solutions. These frequently combine topics covered in the chapter to illustrate how they fit together.
4. *End-of-Chapter Problems.* Finally, we have found that students learn better when they have plenty of opportunity for practice. We therefore provide extensive end-of-chapter questions and problems. For the most part, there are at least 20, and as many as 63, problems for each chapter. This greatly exceeds what is typical in an introductory textbook.

   The questions and problems range in difficulty from relatively easy practice problems to thought-provoking "challenge" problems designed to intrigue enthusiastic students. All problems are fully annotated so that students and instructors can readily identify particular types. Throughout the text, we have worked to supply interesting problems that illustrate real-world applications of chapter material.

Boxed Essays A unique series of brief essays entitled "In Their Own Words" is written by distinguished scholars and practitioners on key topics in the text. To name just a few, these include essays by Merton Miller on capital structure, Richard Roll on security prices, and Fischer Black on dividends. In all cases, the essays are enlightening, informative, and entertaining.

Other Chapter Features Other features, designed to promote learning, include:

1. *Key Terms.* Within each chapter, key terms are highlighted in **boldface** type the first time they appear. Key terms are defined in the text, and there is a running glossary in the margins of the text for quick reminders. For reference there is a comprehensive list of key terms at the end of each chapter.
2. *Key Concept Call-Outs.* Throughout the text, key concepts are broken out separately from the main body of the text and set in color for special emphasis.
3. *Key Result Summary Tables.* Most chapters contain at least one table that succinctly summarizes key principles, results, and equations.
4. *Formula Appendix.* For ease of reference (and formula-sheet preparation), an appendix contains a chapter-by-chapter annotated listing of all the important formulas in the text.
5. *Chapter Reviews.* Each chapter ends with a summary that enumerates the key points and provides an overall perspective on the chapter material.
6. *Suggested Readings.* A short, annotated list of books and articles to which the interested reader may refer for additional information follows each chapter.
7. *Writing Style.* To better engage the reader, the writing style in *Fundamentals of Corporate Finance* is informal. Throughout, we try to convey our considerable enthusiasm for the subject. Students consistently find the relaxed style approachable and likable.

New in the Second Edition

Our new, four-color format is the most obvious change from the first edition. In going this route, we concentrated on using color in ways that made pedagogical sense, rather than using it in a merely decorative way. We use color as a learning tool in a variety of ways—to tie together text, tables, and figures; to highlight key results and equations; to distinguish important terms and concepts; and to draw attention to central calculations and figure elements. A more detailed discussion of color usage can be found inside the back cover of the text. We highly recommend that you refer to this discussion throughout the course; as you begin each chapter, check to see if color will be playing a particular role.

We are especially pleased with the new in-text acetate contained in Chapter 15. Here we combined a detailed color scheme with a series of transparent overlays to illustrate the basics of capital structure and cost of capital as tax and bankruptcy effects are brought into play. The result is a visually effective, building-block approach to optimal capital structure.

We've also added two completely new chapters. First, in response to requests from some of our first edition adopters, Chapter 23 covers leasing in an approachable, straightforward way that is suitable for a principles class. Second, we think that corporate risk management and financial engineering are only going to become more important, so Chapter 24 provides a survey of this rapidly growing area. To our knowledge, no other text contains similar material. We placed these two new chapters at the end of the text to minimize changes in course material for our existing users, but, based on user feedback, we will move them into the section on long-term financing in future editions.

Our working capital chapters have been extensively revised. Chapter 18, our cash management chapter, contains a fully up-to-date discussion of modern practice. We've added to and improved our credit management discussion in Chapter 19, and based on user requests, we've added completely new coverage of inventory management.

Beyond these major changes, we made a very large number of very small changes to update and fine tune our coverage. We simplified our discussion in various places to keep the level of presentation completely consistent, we beefed up international examples throughout, and we made our discussion as current as possible.

Organization of the Text

We have found that the phrase "so much to do, so little time" accurately describes an introductory finance course. For this reason, we designed *Fundamentals of Corporate Finance* to be as flexible and modular as possible. There are a total of nine parts, and, in broad terms, the instructor is free to decide the particular sequence. Further, within each part, the first chapter generally contains an overview and survey. Thus, when time is limited, subsequent chapters can be omitted. Finally, the sections placed early in each chapter are generally the most important, and later sections frequently can be omitted without loss of continuity. For these reasons, the instructor has great control over the topics covered, the sequence in which they are covered, and the depth of coverage.

Part One of the text contains two chapters. Chapter 1 considers the goal of the corporation, the corporate form of organization, the agency problem, and, briefly, financial markets. Chapter 2 succinctly discusses cash flow versus accounting income, market value versus book value, and taxes. It also provides a useful review of financial statements.

After Part One, either Part Two, on financial statements analysis, long-range planning, and corporate growth, or Part Three, on time value and stock and bond valuation, follows naturally. Part Two can be omitted entirely if desired. After Part Three, most instructors will probably want to move directly into Part Four, which covers net present value, discounted cash flow valuation, and capital budgeting.

Part Five contains two chapters on risk and return. The first one, on market history, is designed to give students a feel for typical rates of return on risky assets. The second one discusses the expected return/risk tradeoff, and it develops the security market line in a highly intuitive way that bypasses much of the usual portfolio theory and statistics.

The first chapter of Part Six introduces long-term financing by discussing the essential features of debt and equity instruments. Important elements of bankruptcy and reorganization are covered briefly as well. The second chapter in Part Six covers selling securities to the public with an emphasis on the role of the investment banker and the costs of going public. Because both chapters contain a fair amount of descriptive material, they can easily be assigned as out-of-class reading as time constraints dictate.

Cost of capital, capital structure, and dividend policy are covered in the three consecutive chapters of Part Seven. The chapter on dividends can be covered independently, if desired, and the chapter on capital structure can be omitted without creating loss of continuity.

Part Eight covers issues in short-term financial management. The first of the three chapters is a general survey of short-term management, which is very useful when time does not permit a more in-depth treatment. The next two chapters provide greater detail on cash, credit, and inventory management.

Last, Part Nine covers five important topics: options and optionlike securities, mergers, international finance, leasing, and financial engineering. These chapters contain somewhat greater depth of coverage than the basic text chapters and may be covered partially in courses where time is constrained or completely in courses that give special emphasis to these topics.

Acknowledgments

To borrow a phrase, writing an introductory finance textbook is easy; all you do is sit down at a word processor and open a vein. We never would have completed this book without the incredible amount of help and support we received from literally dozens of our colleagues, editors, family members, and friends. We would like to thank, without implicating, all of you.

Clearly, our greatest debt is to our many colleagues who took the plunge and used the first edition. Needless to say, without this support, there never would have been a second edition!

A great many of our colleagues read the original drafts of our first edition. The fact that this book has so little in common with those drafts is a reflection of the value we placed on the many comments and suggestions that we received. Our second edition reviewers continued this tradition and kept us working to improve the content, organization, and exposition of our text. To the following reviewers, then, we are grateful for their many contributions:

Scott Besley: *University of South Florida*

Ray Brooks: *University of Missouri-Columbia*

Charles C. Bown: *Eastern Washington University*

Charles M. Cox: *Brigham Young University*

Michael Dunn: *California State University, Northridge*

Adrian C. Edwards: *Western Michigan University*

Thomas H. Eyssell: *University of Missouri, St. Louis*

Deborah Ann Ford: *University of Baltimore*

Darryl E. J. Gurley: *Northeastern University*

John M. Harris, Jr.: *Clemson University*

Delvin D. Hawley: *University of Mississippi*

Robert C. Higgins: *University of Washington, Seattle*

Steve Isberg: *University of Baltimore*

James M. Johnson: *Northern Illinois University*

Jarl G. Kallberg: *New York University*

David N. Ketcher: *Drake University*

Morris A. Lamberson: *University of Central Arkansas*

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Pamela P. Peterson: *Florida State University*

George A. Racette: *University of Oregon*

Ron Reiber: *Canisius College*

Jay R. Ritter: *University of Illinois at Urbana-Champaign*

Ricardo J. Rodriguez: *University of Miami*

Martha A. Schary: *Boston University*

Roger Severns: *Mankato State University*

Dilip K. Shome: *Virginia Polytechnic Institute and State University*

Neil W. Sicherman: *University of South Carolina*

George S. Swales, Jr.: *Southwest Missouri State University*

Rolf K. Tedefalk: *University of New Haven*

John G. Thatcher: *Marquette University*

Harry Thiewes: *Mankato State University*

Michael R. Vetsuypens: *Southern Methodist University*

David J. Wright: *University of Notre Dame*

Steve B. Wyatt: *University of Cincinnati*

J. Kenton Zumwalt: *Colorado State University*

Several of our most respected colleagues contributed original essays, which are entitled "In Their Own Words" and appear in selected chapters. To these individuals we extend a special thanks:

Edward I. Altman: *New York University*

Fischer Black: *Goldman Sachs & Co.*

Robert C. Higgins: *University of Washington*

Roger Ibbotson: *Yale University, Ibbotson Associates*

Michael C. Jensen: *Harvard University*

Jarl Kallberg: *New York University*

Richard M. Levich: *New York University*

Robert C. Merton: *Harvard University*

Merton H. Miller: *University of Chicago*

Jay R. Ritter: *University of Illinois at Urbana-Champaign*

Richard Roll: *University of California at Los Angeles*

Charles W. Smithson: *The Chase Manhattan Bank, N.A.*

Stender E. Sweeney: *Times Mirror Company*

Samuel C. Weaver: *Hershey Foods Corporation*

We owe a particular debt to those instructors who risked their teacher evaluations by classroom testing our text in its different incarnations. Of this group, we especially thank Wayne Mikkelson, Megan Partch, and Gordon Melms of the University of Oregon, who offered unsolicited feedback while teaching from the text. And, to the hundreds of students at various universities who suffered through classroom testing of this text, our special thanks.

The following University of Missouri doctoral students did outstanding work for the first and second editions of *Fundamentals:* Susan Chiou, Cheri Etling, Randy Jorgensen, Tie Su, Paul Weise, and Michael Young. To them fell the unenviable task of technical proofreading and, in particular, of carefully checking calculations throughout the text. David Ketcher of Drake University provided especially valuable help in checking answers to our end-of-chapter problems.

Finally, in every phase of this project, we have been privileged to have had the complete and unwavering support of a great organization: Richard D. Irwin, Inc. We are deeply grateful to the select group of professionals that served as our development team. They are: Ron Bloecher, Joanne Dorff, Lew Gossage, Bette Ittersagen, Mike Junior, Rita McMullen, Ann Sass, Gladys True, and Michael Warrell.

Of this group, two deserve particular mention. First, with charm, grace, and tenaciousness, Ann Sass, our longtime and long-suffering developmental editor, coordinated all of the people involved on a day-to-day basis, made sure that the authors kept their promises about deadlines, and generally kept track of thousands of details. Second, Mike Junior, the executive editor, worked with us on this book from conception to completion. As only he can attest, this was no easy task. For his unflagging enthusiasm and support, then, our special appreciation. Others at Irwin, too numerous to list here, have improved this book in countless ways.

Throughout the development of this edition, we have taken great care to discover and eliminate errors. Our goal is to provide the best textbook available on the subject. We want to ensure that future editions are error free, and, to that end, we will gladly offer $10 per arithmetic error to the first individual reporting it as a modest token of our appreciation. More than this, we would like to hear from instructors and students alike. Please write and tell us how to make this a better text. Forward your comments to: Professor Randolph W. Westerfield, School of Business Administration, University of Southern California, University Park, Los Angeles, CA 90089-1421.

Stephen A. Ross

Randolph W. Westerfield

Bradford D. Jordan

Brief Contents

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