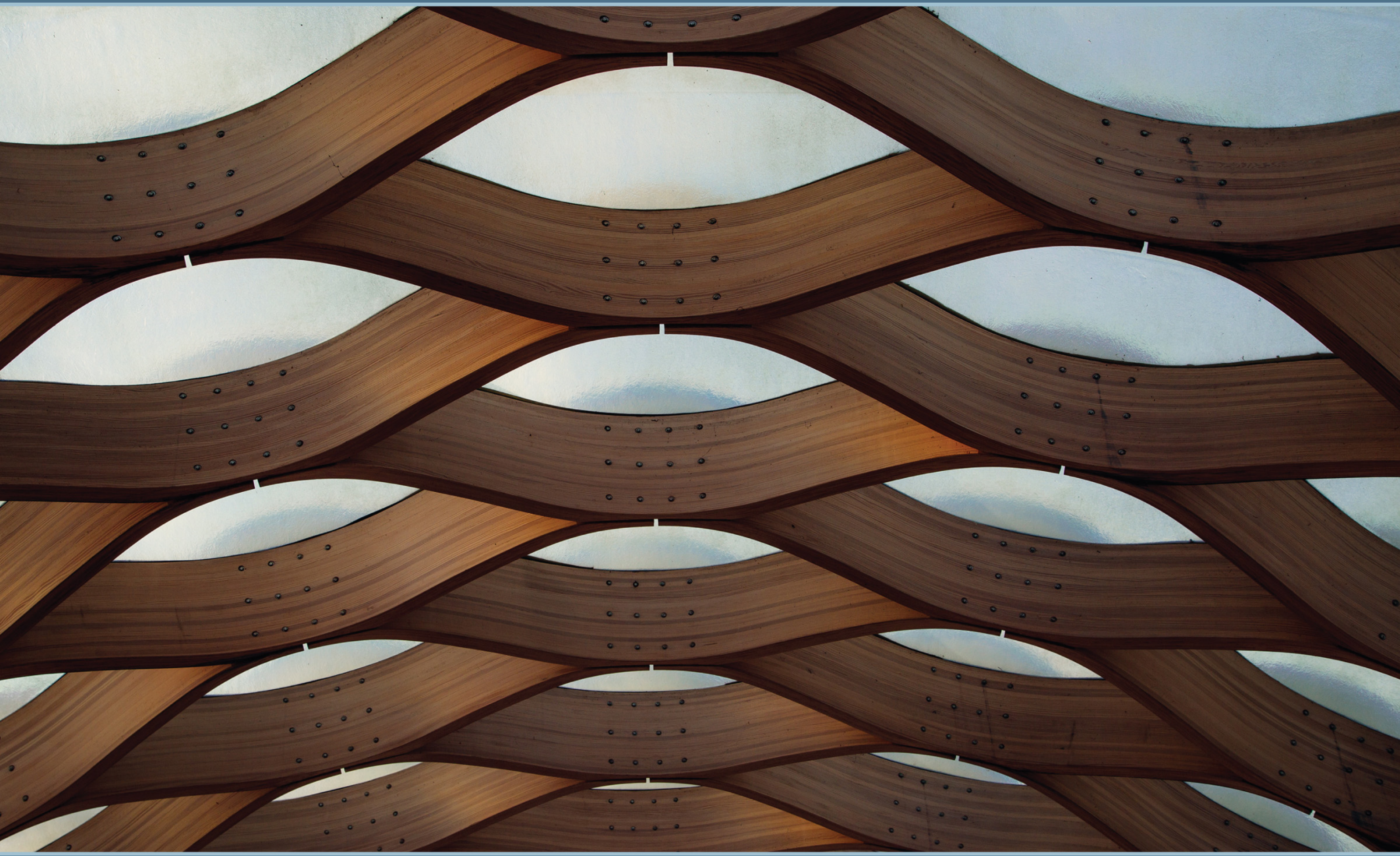
Thirteenth Edition

Principles of CORPORATE FINANCE



Brealey Myers Allen

McGraw Hill Education

Principles *of* Corporate Finance

THE MCGRAW-HILL/IRWIN SERIES IN FINANCE, INSURANCE, AND REAL ESTATE

Financial Management

Block, Hirt, and Danielsen
Foundations of Financial Management
Seventeenth Edition

Brealey, Myers, and Allen
Principles of Corporate Finance
Thirteenth Edition

Brealey, Myers, and Allen
Principles of Corporate Finance, Concise
Second Edition

Brealey, Myers, and Marcus
Fundamentals of Corporate Finance
Ninth Edition

Brooks
FinGame Online 5.0

Bruner
Case Studies in Finance: Managing for Corporate Value Creation
Eighth Edition

Cornett, Adair, and Nofsinger
Finance: Applications and Theory
Fourth Edition

Cornett, Adair, and Nofsinger
M: Finance
Fourth Edition

DeMello
Cases in Finance
Second Edition

Grinblatt (editor)
Stephen A. Ross, Mentor: Influence through Generations

Grinblatt and Titman
Financial Markets and Corporate Strategy
Second Edition

Higgins
Analysis for Financial Management
Twelfth Edition

Ross, Westerfield, Jaffe, and Jordan
Corporate Finance
Twelfth Edition

Ross, Westerfield, Jaffe, and Jordan
Corporate Finance: Core Principles and Applications
Fifth Edition

Ross, Westerfield, and Jordan
Essentials of Corporate Finance
Ninth Edition

Ross, Westerfield, and Jordan
Fundamentals of Corporate Finance
Twelfth Edition

Shefrin
Behavioral Corporate Finance: Decisions that Create Value
Second Edition

Investments

Bodie, Kane, and Marcus
Essentials of Investments
Eleventh Edition

Bodie, Kane, and Marcus
Investments
Eleventh Edition

Hirt and Block
Fundamentals of Investment Management
Tenth Edition

Jordan and Miller
Fundamentals of Investments: Valuation and Management
Eighth Edition

Stewart, Piros, and Heisler
Running Money: Professional Portfolio Management

Sundaram and Das
Derivatives: Principles and Practice
Second Edition

Financial Institutions and Markets

Rose and Hudgins
Bank Management and Financial Services
Tenth Edition

Rose and Marquis
Financial Institutions and Markets
Eleventh Edition

Saunders and Cornett
Financial Institutions Management: A Risk Management Approach
Ninth Edition

Saunders and Cornett
Financial Markets and Institutions
Seventh Edition

International Finance

Eun and Resnick
International Financial Management
Eighth Edition

Real Estate

Brueggeman and Fisher
Real Estate Finance and Investments
Sixteenth Edition

Ling and Archer
Real Estate Principles: A Value Approach
Fifth Edition

Financial Planning and Insurance

Allen, Melone, Rosenbloom, and Mahoney
Retirement Plans: 401(k)s, IRAs, and Other Deferred Compensation Approaches
Twelfth Edition

Altfest
Personal Financial Planning
Second Edition

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

Kapoor, Dlabay, and Hughes
Personal Finance
Twelfth Edition

Walker and Walker
Personal Finance: Building Your Future
Second Edition

Principles *of* Corporate Finance

THIRTEENTH EDITION

Richard A. Brealey
Professor of Finance
London Business School

Stewart C. Myers
Professor of Financial Economics
Sloan School of Management Massachusetts
Institute of Technology

Franklin Allen
Professor of Finance and Economics
Imperial College London

Mc Graw Hill Education

PRINCIPLES OF CORPORATE FINANCE, THIRTEENTH EDITION

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

This book is printed on acid-free paper.

1 2 3 4 5 6 7 8 9 0 LWI/LWI 22 21 20 19

ISBN 978-1-260-01390-0
MHID 1-260-01390-1

Portfolio Manager: *Charles Synovec*
Product Developer: *Noelle Bathurst*
Marketing Manager: *Allison McCabe-Carroll*
Content Project Managers: *Fran Simon and Jamie Koch*
Buyer: *Laura Fuller*
Design: *Matt Diamond*
Content Licensing Specialist: *Ann Marie Jannette*
Cover Image: *Emily Tolan/Shutterstock*
Compositor: *SPi Global*

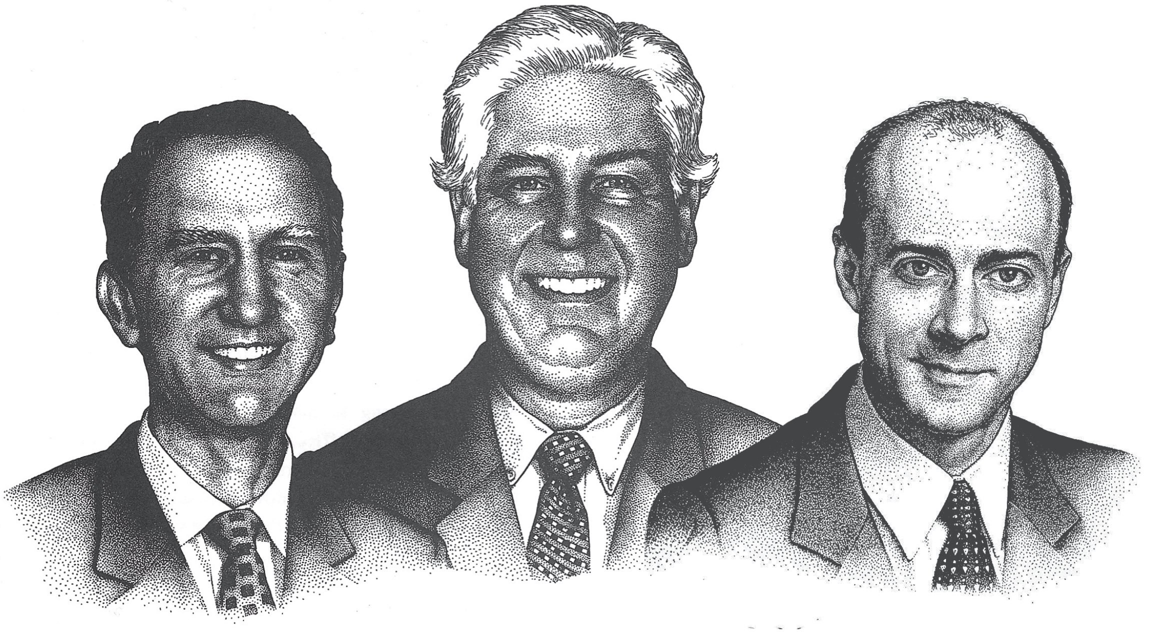
Library of Congress Cataloging-in-Publication Data

Names: Brealey, Richard A., author. | Myers, Stewart C., author. | Allen, Franklin, 1956- author.
Title: Principles of corporate finance / Richard A. Brealey, Professor of Finance, London Business School, Stewart C. Myers, Robert C. Merton (1970) Professor of Finance, Sloan School of Management, Massachusetts Institute of Technology, Franklin Allen, Professor of Finance and Economics, Imperial College London.
Description: Thirteenth edition. | New York, NY : McGraw-Hill Education, [2020]
Identifiers: LCCN 2018040697 | ISBN 9781260013900 (alk. paper)
Subjects: LCSH: Corporations—Finance.
Classification: LCC HG4026 .B667 2020 | DDC 658.15—dc23
LC record available at https://lccn.loc.gov/2018040697

Dedication

To our parents.

About the Authors



Richard A. Brealey

Professor of Finance at the London Business School. He is the former president of the European Finance Association and a former director of the American Finance Association. He is a fellow of the British Academy and has served as a special adviser to the Governor of the Bank of England and director of a number of financial institutions. Books written by Professor Brealey include *Introduction to Risk and Return from Common Stocks.*

Stewart C. Myers

Professor of Financial Economics at MIT's Sloan School of Management. He is past president of the American Finance Association, a research associate at the National Bureau of Economic Research, a principal of the Brattle Group Inc., and a retired director of Entergy Corporation. His research is primarily concerned with the valuation of real and financial assets, corporate financial policy, and financial aspects of government regulation of business. He is the author of influential research papers on many topics, including adjusted present value, rate of return regulation, pricing and capital allocation in insurance, real options, and moral hazard and information issues in capital structure decisions.

Franklin Allen

Professor of Finance and Economics, Imperial College London, and Emeritus Nippon Life Professor of Finance at the Wharton School of the University of Pennsylvania. He is past president of the American Finance Association, Western Finance Association, Society for Financial Studies, Financial Intermediation Research Society, Financial Management Association, and a fellow of the Econometric Society and the British Academy. His research has focused on financial innovation, asset price bubbles, comparing financial systems, and financial crises. He is Director of the Brevan Howard Centre for Financial Analysis at Imperial College Business School.

This book describes the theory and practice of corporate finance. We hardly need to explain why financial managers have to master the practical aspects of their job, but we should spell out why down-to-earth managers need to bother with theory.

Managers learn from experience how to cope with routine problems. But the best managers are also able to respond to change. To do so you need more than time-honored rules of thumb; you must understand why companies and financial markets behave the way they do. In other words, you need a *theory* of finance.

Does that sound intimidating? It shouldn't. Good theory helps you to grasp what is going on in the world around you. It helps you to ask the right questions when times change and new problems need to be analyzed. It also tells you which things you do *not* need to worry about. Throughout this book, we show how managers use financial theory to solve practical problems.

Of course, the theory presented in this book is not perfect and complete—no theory is. There are some famous controversies where financial economists cannot agree. We have not glossed over these disagreements. We set out the arguments for each side and tell you where we stand.

Much of this book is concerned with understanding what financial managers do and why. But we also say what financial managers *should* do to increase company value. Where theory suggests that financial managers are making mistakes, we say so, while admitting that there may be hidden reasons for their actions. In brief, we have tried to be fair but to pull no punches.

This book may be your first view of the world of modern finance. If so, you will read first for new ideas, for an understanding of how finance theory translates into practice, and occasionally, we hope, for entertainment. But eventually you will be in a position to make financial decisions, not just study them. At that point, you can turn to this book as a reference and guide.

Changes in the Thirteenth Edition

We are proud of the success of previous editions of *Principles,* and we have done our best to make the thirteenth edition even better.

Some of the biggest changes in this edition were prompted by the tax changes enacted in the U.S. Tax Cuts and Jobs Act passed in December 2017. One of the chapters most affected was Chapter 6, which is concerned with calculating the present value of capital projects. We describe the major tax changes in that chapter, and we work through an example of a capital budgeting problem with 100% bonus depreciation and a 21% corporate tax rate. But the U.S. system of immediate expensing of capital expenditures is almost unique. So we also set out examples of the more common systems of straight-line depreciation and double-declining-balance, which is essentially identical to the former U.S. MACRS depreciation.

Another 2017 tax change was the limit imposed on interest tax shields. For companies that are caught by this change, it may no longer make sense to discount cash flows by the weighted average cost of capital. We discuss the implications for company debt policy in Chapter 18. In Chapter 19, we show how adjusted present value can be used in these cases to value companies and projects. Similarly, the cap on interest tax shields complicates the valuation of leases. In Chapter 25, we show that when the cap is operative, leases need to be valued by constructing an equivalent loan. Finally, in Chapter 32, we consider the possible effect on the private-equity market.

The third important change was the switch by the United States to a territorial tax system. This has major implications for tax strategies, which we largely discuss in the chapters on working capital management (Chapter 30) and mergers (Chapter 31).

U.S. financial managers work in a global environment and need to understand the financial systems of other countries. Also, many of the text's readers come from countries other than the United States. Therefore, in recent editions we have progressively introduced more international material, including information about the major developing economies, such as China and India. In the current edition, we have continued to augment the international content. We hope that an understanding of practices in other countries will also lead to a better understanding of the characteristics of one's own financial system.

Users of previous editions of this book will not find dramatic changes in coverage or in the ordering of topics. However, there are a number of chapters that have been thoroughly rewritten. For example, the material on agency issues in Chapter 12 has been substantially revised. Chapter 13 on market efficiency and behavioral finance is now fresher and more up to date. Chapter 23 on credit risk focuses more on the practical issues of forecasting default probabilities.

Throughout, we have tried to make the book more up-to-date and easier to read. In many cases, the changes consist of some updated data here and a new example there. Often, these additions reflect some recent development in the financial markets or company practice.

In the 11th edition, we added digital extensions through our Beyond the Page features, or "apps" as we call them. This extra material can allow us to escape from some of the constraints of the printed page by providing more explanation for readers who need it and additional material for those who would like to dig deeper. The Beyond the Page features include extra examples and spreadsheet programs, as well as some interesting anecdotes.

There are now more than 150 of these apps. They are all seamlessly available with a click on the e-versions of the book, but they are also readily accessible from the traditional hard copy of the text through the shortcut URLs. Check out **mhhe.com/brealey13e** to learn more.

Examples of these applications include:

- **Chapter 1** In Chapter 1, we refer to Bernard Madoff's ponzi scheme. But this scam pales into insignificance compared with the great Albanian ponzi scheme, which is described in an app.
- **Chapter 2** Do you need to learn how to use a financial calculator? The Beyond the Page financial calculator application shows how to do so.
- **Chapter 3** Would you like to calculate a bond's duration, see how it predicts the effect of small interest rate changes on bond price, calculate the duration of a common stock, or learn how to measure convexity? The duration application for Figure 3.2 allows you to do so.
- **Chapter 5** Want more practice in valuing annuities? There is an application that provides worked examples and hands-on practice.
- **Chapter 9** How about measuring the betas of the Fama–French three-factor model for U.S. stocks? The Beyond the Page beta estimation application does this.
- **Chapter 14** Ever wonder why Google split its stock into A and C shares? An app provides the answer.
- **Chapter 15** Want to now how companies can raise capital by an initial coin offering? There is an app on the topic.
- **Chapter 19** The text briefly describes the flow-to-equity method for valuing businesses, but using the method can be tricky. We provide an application that guides you step by step.
- **Chapter 20** The Black–Scholes Beyond the Page application provides an option calculator. It also shows how to estimate the option's sensitivity to changes in the inputs and how to measure an option's risk.
- **Chapter 28** Would you like to view the most recent financial statements for different U.S. companies and calculate their financial ratios? There is an application that will do this for you.

We believe that the apps offer an opportunity to widen the types of material that can be made available and help the reader to decide how deeply he or she wishes to explore a topic.

We have added end-of-chapter questions, merged what was becoming a false distinction between basic and intermediate questions, and reordered the questions to follow better the same sequence as the chapter.

Making Learning Easier

Each chapter of the book includes an introductory preview, a summary, and an annotated list of suggested further reading. The list of possible candidates for further reading is now voluminous. Rather than trying to include every important article, we largely list survey articles or general books. We give more specific references in footnotes.

Each chapter is followed by a set of problems on both numerical and conceptual topics and a few challenge problems. Answers to the starred problems appear in the Appendix at the end of the book.

We included a Finance on the Web section in chapters where it makes sense to do so. This section now houses a number of Web Projects, along with new Data Analysis problems. These exercises seek to familiarize the reader with some useful websites and to explain how to download and process data from the web.

The book also contains 13 end-of-chapter Mini-Cases. These include specific questions to guide the case analyses. Answers to the mini-cases are available to instructors on the book's website.

Spreadsheet programs such as Excel are tailor-made for many financial calculations. Several chapters include boxes that introduce the most useful financial functions and provide some short practice questions. We show how to use the Excel function key to locate the function and then enter the data. We think that this approach is much simpler than trying to remember the formula for each function.

We conclude the book with a glossary of financial terms.

The 34 chapters in this book are divided into 11 parts. Parts 1, 2, and 3 cover valuation and capital investment decisions, including portfolio theory, asset pricing models, and the cost of capital. Parts 4 through 8 cover payout policy, capital structure, options (including real options), corporate debt, and risk management. Part 9 covers financial analysis, planning, and working-capital management. Part 10 covers mergers and acquisitions, corporate restructuring, and corporate governance around the world. Part 11 concludes.

We realize that instructors will wish to select topics and may prefer a different sequence. We have therefore written chapters so that topics can be introduced in several logical orders. For example, there should be no difficulty in reading the chapters on financial analysis and planning before the chapters on valuation and capital investment.

Acknowledgments

We have a long list of people to thank for their helpful criticism of earlier editions and for assistance in preparing this one. They include Faiza Arshad, Aleijda de Cazenove Balsan, Kedran Garrison, Robert Pindyck, Donna Cheung, and Gretchen Slemmons at MIT; Elroy Dimson, Paul Marsh, Mike Staunton, and Stefania Uccheddu at London Business School; Lynda Borucki, Marjorie Fischer, Larry Kolbe, Michael Vilbert, Bente Villadsen, and Fiona Wang at The Brattle Group Inc.; Alex Triantis at the University of Maryland; Adam Kolasinski at Texas A&M University; Simon Gervais at Duke University; Michael Chui at Bank for International Settlements; Pedro Matos at the University of Southern California; Yupana Wiwattanakantang at National University of Singapore; Nickolay Gantchev at the Southern Methodist University; Tina Horowitz, and Lin Shen, at the University of Pennsylvania; Darien Huang at Tudor Investment; Julie Wulf at Harvard University; Jinghua Yan at SAC Capital; Bennett Stewart at EVA Dimensions; and Mobeen Iqbal and Antoine Uettwiller at Imperial College London. We are grateful to Cyrus Brealey for his suggestions.

We would also like to thank the dedicated experts who have helped with updates to the instructor materials and online content in Connect and LearnSmart, including Kay Johnson, Blaise Roncagli, Deb Bauer, Mishal Rawaf, Marc-Anthony Isaacs, Frank Ryan, Peter Crabb, Victoria Mahan, Nicholas Racculia, Angela Treinen, and Kent Ragan.

We want to express our appreciation to those instructors whose insightful comments and suggestions were invaluable to us during the revision process:

Ibrahim Affaneh *Indiana University of Pennsylvania*
Neyaz Ahmed *University of Maryland*
Alexander Amati *Rutgers University, New Brunswick*
Anne Anderson *Lehigh University*
Noyan Arsen *Koc University*
Anders Axvarn *Gothenburg University*
John Banko *University of Florida, Gainesville*
Michael Barry *Boston College*
Jan Bartholdy *ASB, Denmark*
Penny Belk *Loughborough University*
Omar Benkato *Ball State University*
Eric Benrud *University of Baltimore*
Ronald Benson *University of Maryland, University College*
Peter Berman *University of New Haven*
Tom Boulton *Miami University of Ohio*
Edward Boyer *Temple University*
Alon Brav *Duke University*
Jean Canil *University of Adelaide*
Robert Carlson *Bethany College*
Chuck Chahyadi *Eastern Illinois University*
Fan Chen *University of Mississippi*
Celtin Ciner *University of North Carolina, Wilmington*
John Cooney *Texas Tech University*
Charles Cuny *Washington University, St. Louis*
John Davenport *Regent University*
Ray DeGennaro *University of Tennessee, Knoxville*
Adri DeRidder *Gotland University*
William Dimovski *Deakin University, Melbourne*
David Ding *Nanyang Technological University*
Robert Duvic *University of Texas at Austin*
Alex Edmans *London Business School*
Susan Edwards *Grand Valley State University*
Riza Emekter *Robert Morris University*
Robert Everett *Johns Hopkins University*
Dave Fehr *Southern New Hampshire University*
Donald Flagg *University of Tampa*
Frank Flanegin *Robert Morris University*
Zsuzanna Fluck *Michigan State University*
Connel Fullenkamp *Duke University*
Mark Garmaise *University of California, Los Angeles*
Sharon Garrison *University of Arizona*
Christopher Geczy *University of Pennsylvania*
George Geis *University of Virginia*
Stuart Gillan *University of Delaware*
Felix Goltz *Edhec Business School*
Ning Gong *Melbourne Business School*
Levon Goukasian *Pepperdine University*
Gary Gray *Pennsylvania State University*
C. J. Green *Loughborough University*
Mark Griffiths *Thunderbird, American School of International Management*
Re-Jin Guo *University of Illinois, Chicago*
Ann Hackert *Idaho State University*
Winfried Hallerbach *Erasmus University, Rotterdam*
Milton Harris *University of Chicago*
Mary Hartman *Bentley College*
Glenn Henderson *University of Cincinnati*
Donna Hitscherich *Columbia University*
Ronald Hoffmeister *Arizona State University*
James Howard *University of Maryland, College Park*
George Jabbour *George Washington University*