INVESTMENT MANAGEMENT

R. Stephen Sears *Gary L. Trennepohl*

INVESTMENT MANAGEMENT

R. Stephen Sears
Texas Tech University

Gary L. Trennepohl
Texas A & M University

THE DRYDEN PRESS
Harcourt Brace Jovanovich College Publishers

Fort Worth Philadelphia San Diego New York Orlando Austin
San Antonio Toronto Montreal London Sydney Tokyo

Editor in Chief	Robert A. Pawlik
Acquisitions Editor	Michael Roche
Developmental Editor	Craig Avery
Project Editor	Jon Gregory
Production Manager	Jacqui Parker, Mandy Manzano
Book Designer	Pat Bracken
Permissions Editor	Sheila Shutter
Copy Editor	Mary Englehart
Cover Photos	Gold Bars: © Murray Alcosser/Image Bank Japanese Businessmen: © Dewitt Jones/Allstock Oil Rig: Courtesy of Mobil Corp. Stock Exchange: © Alan Rosenberg/Courtesy AMEX Circle Farming: Courtesy Valmont Industries, Inc. Man at Desk: Courtesy of Enron Corp., Michael Hart Photo.

Address for Editorial Correspondence
The Dryden Press, 301 Commerce Street, Suite 3700, Fort Worth, TX 76102

Address for Orders
The Dryden Press, 6277 Sea Harbor Drive, Orlando, FL 32887
1-800-782-4479, or 1-800-433-0001 (in Florida)

THIS BOOK WAS PRINTED ON RECYCLED PAPER
Made from 10% post-consumer waste
and 40% pre-consumer waste.

The total recycled fibre content
is 50% by fibre weight.

ISBN: 0-03-028662-X
Library of Congress Number: 92-071204

Printed in the United States of America
3 4 5 6 039 9 8 7 6 5 4 3 2 1

The Dryden Press
Harcourt Brace Jovanovich

This book is dedicated to those we love:
Reva, Matthew, and Elizabeth Sears
Sandra, Paige, and Adrienne Trennepohl
without whose support and encouragement this
project would not have been possible.

The Dryden Press Series in Finance

Amling and Droms
Investment Fundamentals

Berry and Young
Managing Investments: A Case Approach

Boyet
Security Analysis for Investment Decisions: Text and Software

Brigham
Fundamentals of Financial Management
Sixth Edition

Brigham and Gapenski
Cases in Financial Management
Second Edition

Brigham and Gapenski
Cases in Financial Management: Module A; Module B; Module C
Second Edition

Brigham and Gapenski
Financial Management: Theory and Practice
Sixth Edition

Brigham and Gapenski
Intermediate Financial Management
Fourth Edition

Brigham, Gapenski, and Aberwald
Finance with Lotus 1-2-3
Second Edition

Campsey and Brigham
Introduction to Financial Management
Third Edition

Chance
An Introduction to Options and Futures
Second Edition

Clauretie and Webb
The Theory and Practice of Real Estate Finance

Cooley
Advances in Business Financial Management: A Collection of Readings

Cooley and Roden
Business Financial Management
Second Edition

Curran
Principles of Corporate Finance

Evans
International Finance: A Markets Approach

Fama and Miller
The Theory of Finance

Gardner and Mills
Managing Financial Institutions: An Asset/Liability Approach
Second Edition

Gitman and Joehnk
Personal Financial Planning
Sixth Edition

Harrington
Case Studies in Financial Decision Making
Third Edition

Hayes and Meerschwam
Financial Institutions: Contemporary Cases in the Financial Services Industry

Johnson
Issues and Readings in Managerial Finance
Third Edition

Kidwell, Peterson, and Blackwell
Financial Institutions, Markets, and Money
Fifth Edition

Koch
Bank Management
Second Edition

Kohn
Money, Banking, and Financial Markets
Second Edition

Lee and Finnerty
Corporate Finance: Theory, Method, and Application

Maisel
Real Estate Finance
Second Edition

Martin, Cox, and MacMinn
The Theory of Finance: Evidence and Applications

Mayo
Finance: An Introduction
Fourth Edition

Mayo
Investments: An Introduction
Third Edition

Pettijohn
PROFIT+

Reilly
Investment Analysis and Portfolio Management
Third Edition

Reilly
Investments
Third Edition

Sears and Trennepohl
Investment Management

Seitz
Capital Budgeting and Long-Term Financing Decisions

Siegel and Siegel
Futures Markets

Smith and Spudeck
Interest Rates: Principles and Applications

Stickney
Financial Statement Analysis: A Strategic Perspective
Second Edition

Turnbull
Option Valuation

Weston and Brigham
Essentials of Managerial Finance
Tenth Edition

Weston and Copeland
Managerial Finance
Ninth Edition

Wood and Wood
Financial Markets

The HBJ College Outline Series

Baker
Financial Management
Fifth Edition

Preface

The past 20 years have brought dramatic changes to securities and securities markets. Traditional stocks and bonds are still the primary financial assets for most investors, but they are now supplemented by a broad range of derivative investment products not previously available. Today's investor must be familiar with a variety of financial securities including listed options on stocks, bonds, and market indexes, futures on financial instruments and indexes, options on futures, STRIPS, ARPS, puttable preferred stock, and many others. While these new instruments have increased the complexity of the portfolio manager's job, they have greatly enhanced the investment manager's ability to control risk and return. In addition, these new securities have spawned new theories of asset valuation. Unfortunately, most competing investment textbooks do not show how to use these instruments as tools for controlling risk, nor do they integrate these securities into their discussions of the portfolio management process.

Another factor dramatically changing portfolio management is the global integration of security markets. Twenty-four hour trading of securities around the world is a reality. Familiarity with global markets, indexes, and securities is essential for the new generation of portfolio managers. Investors must understand the diversification opportunities offered by trading securities in Tokyo, Hong Kong, Frankfurt, Paris, and London, as well as in New York and Chicago. To be successful, students must develop a global viewpoint about investment management.

For those accustomed to traditional investment textbooks, *Investment Management* presents concise, analytical coverage of standard investment topics such as the functioning of securities markets, and stock and bond valuation. However, it is distinctive from other books because it integrates throughout the text (1) material about derivative instruments—futures and options, and their applications in portfolio management strategies and performance analysis, and (2) information about international markets and securities which will provide students with a global perspective about investment management.

INTENDED MARKET AND USE

This text is appropriate for the first or second undergraduate course in investments, or for the investments course in an M.B.A. program. The prerequisite for using this book is the traditional first class in corporate finance. The presentation we use is analytical in nature. Knowledge of basic statistical concepts and differential calculus is useful but not mandatory. Appendices and footnotes review matrix algebra, differential calculus, Lagrange multipliers, and expectational variables.

While striving for completeness, the text contains too much material for most instructors to cover completely in one term. It is not designed with the intent of discussing all of the material in class. Rather, the material is written so that students can study and explore many topics on their own. For example, we have found that most students are fascinated with descriptions of alternative financial assets and market mechanics; thus, we have provided significant detail about these topics in Chapter 2 and 3. Most of this material is easily read and understood by students outside of the class, enabling the instructor to focus on the more difficult concepts during class time. Also, by using chapters selectively, instructors will be able to use the text with a variety of students and objectives for courses of varying length.

In addition, the extra detail which we present about a variety of investment topics makes the text useful as a reference work, both for use in more advanced courses, and as a tool for the on-the-job application after graduation. We also hope that students can apply "Chapter 22 *Personal Portfolio Management*" to their own investments.

FEATURES

The text contains many unique features, both in content and pedagogy. A sampling of these features follow:

- The book incorporates up-to-date information available about investments and management. Included are the latest empirical research about market efficiency, (Fama and French), the CAPM (is beta dead?), APT, market anomalies, and approaches to the evaluation of institutional investment managers.
- Theoretical and practical applications are integrated throughout the text. Theoretical concepts are best understood when applied to real world situations. With this in mind, real-life date is used to illustrate concepts. For instance, stock price, dividends, and earnings data for McDonald's, TECO, and Wal-Mart are used throughout the text to illustrate concepts related to market efficiency, security analysis, and portfolio selection. Furthermore, because students are very interested in how the markets really work, we include detailed, lively descriptions of market operations in our chapters.
- Standard investment instruments such as stocks and bonds are described in interesting and concise language as well as the analytical techniques used to value them. For example, the management of bond portfolios has become increasingly complex because of increased interest rate volatility. Thus, our chapters on bonds include sections on duration, immunization, and bond swaps in addition to standard valuation procedures.
- Material about options and futures is introduced in Chapter 2, where basic characteristics of all securities are presented. Later in the book, we include two chapters covering basic features of options and futures and how these securities are priced. Two additional chapters also are included which show how to use these instruments in managing risk and constructing portfolios.
- We provide students with the techniques which will allow them to understand the risks and expected returns of alternative securities and how they can be combined to achieve stated objectives. Portfolio evaluation techniques include standard two-moment measures as well as procedures not dependent upon assumed normality of returns or quadratic utility.
- Financial markets are becoming globalized, and Japanese and European investment bankers are moving into areas that were traditionally domi-

nated by U.S. firms. Because of these developments, *Investment Management* is a text designed for investing in a global environment.

- The material in the book is useful to students both for personal investing strategies and as professional investment managers. Many chapters include information regarding institutional investors, and Chapter 17 is devoted entirely to institutional investment management. Alternatively, examples in each chapter usually address decisions faced by individual investors. Students completing the course should be able to make informed decisions about personal investments, and they will have a firm foundation for employment in professional investment management organizations.
- Each chapter contains a chapter outline and an opening vignette that places the chapter's purpose in perspective. Furthermore, most chapters contain at least one boxed item which illustrates concepts from the text through an extended example. These boxes will stimulate student interest and provide a basis for classroom discussion.
- Numerous graphs and tables are used to help illustrate difficult principles and examples. The graphs are reproduced in a large size, are explicitly detailed, and use color when necessary.
- All key terms are noted in boldface type and are defined in context. The end-of-book index provides a reference for all key terms by noting them in bold.
- Each chapter provides a selection of questions for review and problems which can be used for class discussion or homework assignment.
- In addition to the full references provided in footnotes, selected references are provided after every chapter.

ANCILLARY MATERIALS

The following have been designed to accompany the text and provide students and instructors with a complete teaching/learning package:

1. *Instructor's Manual with Test Bank and Transparency Masters.* A comprehensive manual contains: (1) suggested course outlines, (2) chapter outlines and teaching notes, (3) answers and solutions to all of the text questions and problems, (4) a selection of extra problems which can be used for testing, and (5) a set of transparency masters that reproduce exhibits from the text and provide problem solutions which have been adapted for classroom presentation. The manual has been prepared by R. Stephen Sears, Gary L. Trennepohl, and Stuart E. Michelson of Eastern Illinois University.
2. *Study Guide.* This supplement, authored by Joseph Vu of DePaul University, provides an outline for each chapter, provides students with a self-test quiz, and provides problems similar to those found in *Investment Management* and the accompanying *Test Bank* with complete solutions.
3. *Investment Management for the Personal Computer (IM/PC).* This user-friendly, menu-driven software package designed specifically for the Dryden Press, allows students to access data, solve problems, and perform sensitivity analysis. Specific modules on the disk are designed to aid

the student in understanding concepts related to security analysis, portfolio models, and valuation issues related to bonds, stocks, options, and futures. The program was developed by James Pettijohn of Southwest Missouri State University with input from the authors. The software requires an IBM-PC or true compatible with at least 640K of memory.

ACKNOWLEDGEMENTS

This book reflects the efforts of a great many people over many years. We would like to thank the following individuals who answered a survey that provided us with valuable feedback as we undertook the writing process:

Allen Anderson *University of Akron*
Seth Anderson *Auburn University*
Stanley Atkinson *University of Central Florida*
Carol Billingham *Central Michigan University*
Paul Bolster *Northeastern University*
Mary Broske *Oklahoma State University*
Don Chance *Virginia Polytechnic and State University*
John Dunkelberg *Wake Forest University*
John Earl *University of Richmond*
Adrian Edwards *Western Michigan University*
Philip Fanara *Howard University*
Harvey Faram *Northern Arizona University*
Paul Fellows *University of Iowa*
Adam Gehr *DePaul University*
Keith Johnson *University of Kentucky*
Jerry Komarynaky *Northern Illinois University*
Cheyn Lin *University of Cincinnati*
Pu Liu *University of Arkansas*
Phil Malone *University of Mississippi*
Linda Martin *Arizona State University*
Peter Michaels *Northern Trust of Chicago*
Edward Miller *University of New Orleans*
Bruce Resnick *Indiana University*
James Severino *Pacific Lutheran University*
Keith Smith *Purdue University*
Laura Starks *University of Texas-Austin*
Richard Stolz *California State University-Fullerton*
N. Subramanian *American University*
Jack Treynor *University of Southern California*
Jim Wansley *University of Tennessee*
Bill Williams *Arkansas State University*
John Wingender *Oklahoma State University*

In addition, we would like to thank the following people who provided feedback through the writing and revision process:

Allen Anderson *University of Akron*
Stanley Atkinson *University of Central Florida*
James Bittman *The Options Institute-Chicago Board Options Exchange*
Paul Bolster *Northeastern University*
John Crockett *George Mason University*
Richard Dellva *Villanova University*
Richard DeFusco *University of Nebraska*
David Distad *University of California-Berkeley*
Paul Halpern *University of Toronto*
Don Houthakker *Eastern Michigan University*
Alex Jacobsen *The Options Institute-Chicago Board Options Exchange*
Brad Jordan *University of Missouri-Columbia*
Susan Jordan *University of Missouri-Columbia*
Robert Kleiman *Babson College*
Stephen Mann *University of South Carolina*
Gregory Niehaus *University of Michigan*
Henry Oppenheimer *University of Rhode Island*
Robert Peevey *University of Houston*
Mark Simmons *Stephen F. Austin State University*
L. Glen Strasburg *California State University-Hayward*
Laura Starks *University of Texas-Austin*
Sonny Tucker *Shell Pension Trust*
Joseph Vu *DePaul University*
Marilyn Wiley *Florida Atlantic University*
John Wingender *Oklahoma State University*
Kent Zumwalt *Colorado State University*

Special thanks are due to Tom Eyssell, *University of Missouri-St. Louis,* who assisted in the development of the materials related to preferred stock, warrants, convertible securities, and institutional investors. We also thank Joan Junkus, *DePaul University,* who contributed to development of the chapters about futures. Finally, we thank Robert Ricketts, *Texas Tech University,* who served as the reviewer for Appendix 2A on taxes.

CONCLUSION

Most students want their investments texts to be clear and understandable with numerous examples; academically rigorous, yet useful and practical in nature. A strong analytical background will enable them to understand future new securities and adapt to the ever-changing investment environment. Practical illustrations of analytical techniques will allow students to step comfortably from the academic environment into their first position in the business community.

With the help of the numerous reviewers listed above, and more than fifteen years teaching graduate and undergraduate students, we believe this text meets those objectives. Combining the text with the computer software programs and data, the study guide and instructor's manual, the students can develop a firm understanding of investment management and the constantly changing investment environment.

We also want to express our gratitude to Mike Roche, Craig Avery, Jacqui Parker, Mandy Manzano, Pat Bracken, Sheila Shutter, Jon Gregory, and the professionals at Dryden Press whose hard work and guidance made this book a reality. Mike Roche, the Acquisitions Editor, was involved with this project from the beginning. Mike has been extremely helpful, patient, and supportive throughout the development process, especially during the final year of production when the completion date became a reality. Jon Gregory, the Project Editor, whose attention to detail and careful review of the manuscript pages helped us produce a text which hopefully your students will find is easy to read and relatively free of errors.

Thanks also are appropriate to our graduate students who reviewed the chapters and provided feedback about the text and end-of-chapter questions. Sadhana Alangar of Texas Tech University, along with Robert Peevey and Marilyn Wiley of Texas A&M University were exceptionally helpful in reviewing the early drafts of chapters, providing suggestions for improving the text, and in working through the end-of-chapter problems and examples. Sadhana Alangar, Chenchu Bathala, and Terry Jalbert at Texas Tech University provided valuable assistance in gathering data used to illustrate concepts developed in the text. Joe Reising and Glen Sroka at Texas A&M helped proofread and review the final pages for errors and omissions. Shelly Jenkins of Texas Tech University did a masterful job in typing many of the chapters.

Finally, we want to thank our families, Reva, Matthew, and Elizabeth Sears, and Sandra, Paige, and Adrienne Trennepohl, without whose sacrifice, support, and understanding we could not have accomplished this project.

Too often unsaid, you truly are the wind beneath our wings and the inspiration for our achievements.

R. Stephen Sears
Texas Tech University
Lubbock, Texas

Gary L. Trennepohl
Texas A&M University
College Station, Texas

November, 1992

Contents in Brief

Contents

II. CONCEPTS UNDERLYING THE ANALYSIS AND SELECTION OF INVESTMENT PORTFOLIOS 189