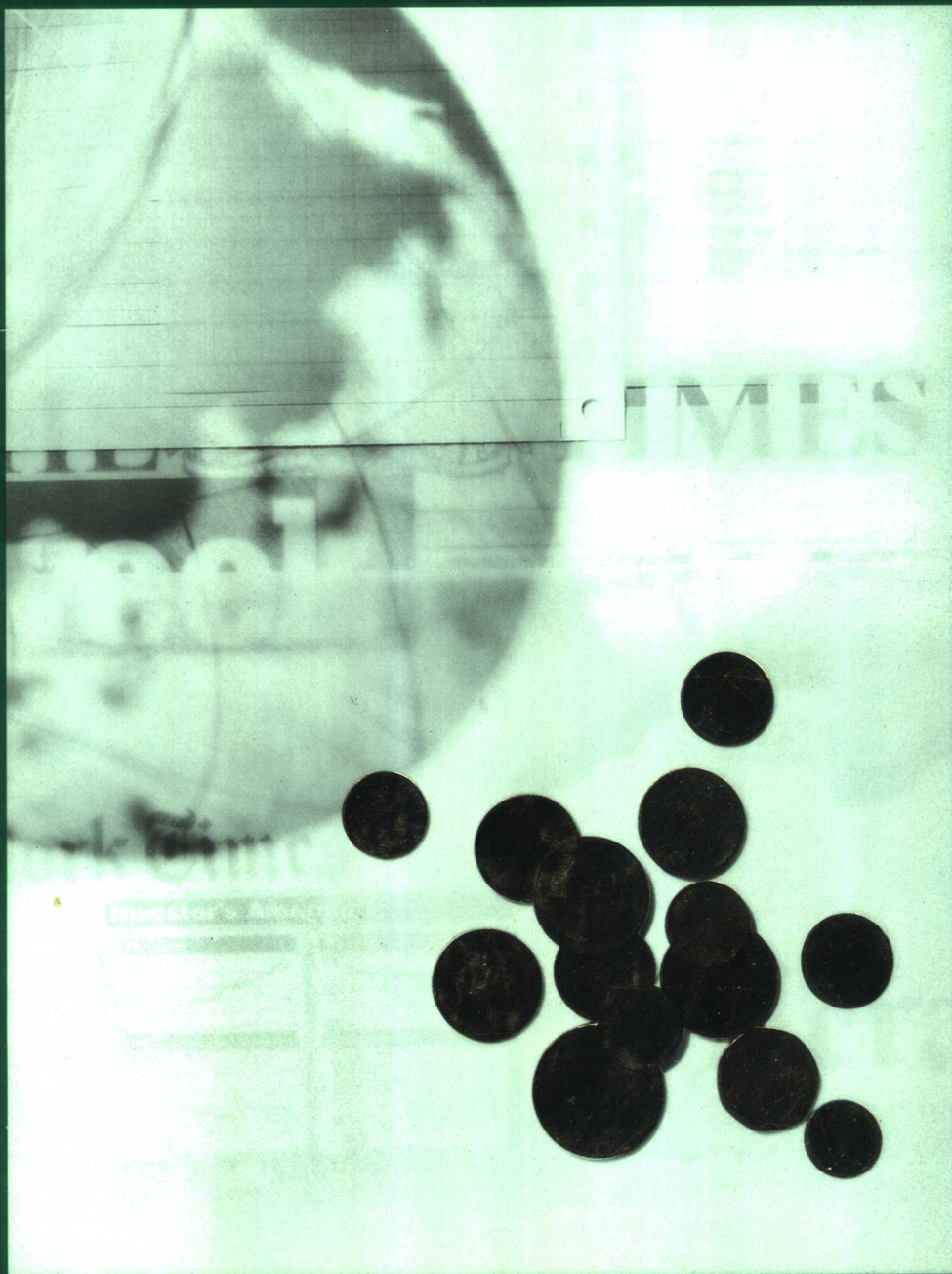


Bodie

Kane

Marcus



INVESTMENTS

Fourth Edition

FOURTH EDITION

INVESTMENTS

ZVI BODIE
BOSTON UNIVERSITY

ALEX KANE
UNIVERSITY OF CALIFORNIA, SAN DIEGO

ALAN J. MARCUS
BOSTON COLLEGE



McGraw-Hill **Irwin McGraw-Hill**

Boston Burr Ridge, IL Dubuque, IA Madison, WI New York San Francisco St. Louis
Bangkok Bogotá Caracas Lisbon London Madrid
Mexico City Milan New Delhi Seoul Singapore Sydney Taipei Toronto

To our families with love and gratitude.

Irwin/McGraw-Hill

A Division of The McGraw-Hill Companies

INVESTMENTS

Copyright © 1999 by The McGraw-Hill Companies, Inc. All rights reserved. Previous editions © 1989, 1993, and 1996, by Richard D. Irwin, a Times Mirror Higher Education Group, Inc. company. Printed in the United States of America. Except as permitted under the United States Copyright Act of 1976, no part of this publication may be reproduced or distributed in any form or by any means, or stored in a data base or retrieval system, without the prior written permission of the publisher.

This book is printed on acid-free paper.

3 4 5 6 7 8 9 0 DOW/DOW 9 3 2 1 0

ISBN 0-256-24626-2

ISBN 0-256-26192-X (Wall Street Journal edition)

Vice president and editorial director: *Michael W. Junior*

Publisher: *Craig S. Beytlen*

Associate sponsoring editor: *Shelley Kronzek*

Developmental editor: *Michele Janicek*

Senior marketing manager: *Katie Rose-Matthews*

Senior project manager: *Jean Lou Hess*

Senior production supervisor: *Melanie Salvati*

Senior designer: *Crispin Prebys*

Supplement coordinator: *Marc Mattson*

Compositor: *GAC Shepard Poorman Communications*

Typeface: *10/12 Times Roman*

Printer: *R. R. Donnelley & Sons Company*

Library of Congress Cataloging-in-Publication Data

Bodie, Zvi.

Investments / Zvi Bodie, Alex Kane, Alan J. Marcus. — 4th ed.

p. cm. — (Irwin/McGraw-Hill series in finance, insurance,
and real estate)

Includes index.

ISBN 0-256-24626-2

I. Investments. 2. Portfolio management. I. Kane, Alex.

II. Marcus, Alan, J. III. Title. IV. Series.

HG4521.B564 1999

332.63'2—dc21

98-8117

<http://www.mhhe.com>

ZVI BODIE

BOSTON UNIVERSITY

Zvi Bodie is Professor of Finance at Boston University School of Management. He holds a Ph.D. from the Massachusetts Institute of Technology and has served on the finance faculty at Harvard University and at MIT. He currently serves as a member of the Pension Research Council at the University of Pennsylvania. He has published widely on pension finance, the management of financial guarantees in both the private and public sector, and investment strategy in an inflationary environment. He has coedited several books on pensions, including *Securing Employer Pensions: An International Perspective*, *Pensions and the Economy: Sources, Uses and Limitations of Data*, *Pensions in the U.S. Economy*, *Issues in Pension Economics*, and *Financial Aspects of the U.S. Pension System*. His research on pensions has focused on the funding and investment policies of private pension plans and on public policies such as the provision of government pension insurance. He has consulted on pension policy for the U.S. Department of Labor, the State of Israel, and Bankers Trust Co.

ALEX KANE

UNIVERSITY OF CALIFORNIA, SAN DIEGO

Alex Kane is professor of finance and economics at the Graduate School of International Relations and Pacific Studies at the University of California, San Diego. He was visiting professor at the Faculty of Economics, University of Tokyo; Graduate School of Business, Harvard; Kennedy School of Government, Harvard; and research associate, National Bureau of Economic Research. An author of many articles in finance and management journals, Professor Kane's research is mainly in corporate finance, portfolio management, and capital markets, most recently in the measurement of market volatility and the pricing of options. Professor Kane is the developer of the *International Simulation Laboratory (ISL)* for training and experimental research in executive decision making.

ALAN J. MARCUS

BOSTON COLLEGE

Alan Marcus is professor of finance and chairman of the finance department in the Wallace E. Carroll School of Management at Boston College. He received his Ph.D. in Economics from MIT in 1981. Professor Marcus recently has been a visiting professor at the Athens Laboratory of Business Administration and at MIT's Sloan School of Management and has served as a research associate at the National Bureau of Economic Research. He also established the Chartered Financial Analysts Review Program at Boston College. Professor Marcus has published widely in the fields of capital markets and portfolio management, with an emphasis on applications of futures and options pricing models. His consulting work has ranged from new product development to provision of expert testimony in utility rate proceedings. He also spent two years at the Federal Home Loan Mortgage Corporation (Freddie Mac), where he developed models of mortgage pricing and credit risk, and he currently serves on the Advisory Council for the Currency Risk Management Alliance of State Street Bank and Windham Capital Management Boston.

In teaching and practice, the field of investments has experienced many changes over the last two decades. This is due in part to an abundance of newly designed securities, in part to the creation of new trading strategies that would have been impossible without concurrent advances in computer technology, and in part to rapid advances in the theory of investments that have come out of the academic community. In no other field, perhaps, is the transmission of theory to real-world practice as rapid as is now commonplace in the financial industry. These developments place new burdens on practitioners and teachers of investments far beyond what was required only a short while ago.

Investments, Fourth Edition, is intended primarily as a textbook for courses in investment analysis. Our guiding principle has been to present the material in a framework that is organized by a central core of consistent fundamental principles. We make every attempt to strip away unnecessary mathematical and technical detail, and we have concentrated on providing the intuition that may guide students and practitioners as they confront new ideas and challenges in their professional lives.

Our primary goal is to present material of practical value, but all three of us are active researchers in the science of financial economics and find virtually all of the material in this book to be of great intellectual interest. Fortunately, we think, there is no contradiction in the field of investments between the pursuit of truth and the pursuit of money. Quite the opposite. The capital asset pricing model, the arbitrage pricing model, the efficient markets hypothesis, the option-pricing model, and the other centerpieces of modern financial research are as much intellectually satisfying subjects of scientific inquiry as they are of immense practical importance for the sophisticated investor.

In our effort to link theory to practice, we have attempted to make our approach consistent with that of the Institute of Chartered Financial Analysts (ICFA), a subsidiary of the Association of Investment Management and Research (AIMR). In addition to fostering research in finance, the AIMR and ICFA administer an education and certification program to candidates seeking the title of Chartered Financial Analyst (CFA). The CFA curriculum represents the consensus of a committee of distinguished scholars and practitioners regarding the core of knowledge required by the investment professional.

There are many features of this text that make it consistent with and relevant to the CFA curriculum. The end-of-chapter problem sets contain questions from past CFA exams, and, for students who will be taking the exam, Appendix B is a useful tool that lists each CFA question in the text and the exam from which it has been taken. Chapter 3 includes excerpts from the "Code of Ethics and Standards of Professional Conduct" of the ICFA. Chapter 26, which discusses investors and the investment process, and is modeled after the ICFA outline.

UNDERLYING PHILOSOPHY

We believe that attention to a few important principles can simplify the study of otherwise difficult material and that fundamental principles should organize and motivate all study. These principles are crucial to understanding the securities already traded in financial

markets and in understanding new securities that will be introduced in the future. For this reason, we have made this book thematic, meaning we never offer rules of thumb without reference to the central tenets of the modern approach to finance.

The common theme unifying this book is that *security markets are nearly efficient*, meaning most securities are usually priced appropriately given their risk and return attributes. There are few free lunches found in markets as competitive as the financial market. This simple observation is, nevertheless, remarkably powerful in its implications for the design of investment strategies; as a result, our discussions of strategy are always guided by the implications of the efficient markets hypothesis. While the degree of market efficiency is, and always will be, a matter of debate, we hope our discussions throughout the book convey a good dose of healthy criticism concerning much conventional wisdom.

Distinctive Themes

This edition of *Investments* is organized around several important themes:

1. The central theme is the near-informational-efficiency of well-developed security markets, such as those in the United States, and the general awareness that competitive markets do not offer “free lunches” to participants.
A second theme is the risk-return trade-off. This too is a no-free-lunch notion, holding that in competitive security markets, higher expected returns come only at a price: the need to bear greater investment risk. However, this notion leaves several questions unanswered. How should one measure the risk of an asset? What should be the quantitative trade-off between risk (properly measured) and expected return? The approach we present to these issues is known as *modern portfolio theory*, which is another organizing principle of this book. Modern portfolio theory focuses on the techniques and implications of *efficient diversification*, and we devote considerable attention to the effect of diversification on portfolio risk as well as the implications of efficient diversification for the proper measurement of risk and the risk-return relationship.
2. This text places greater emphasis on **asset allocation** than most of its competitors. We prefer this emphasis for two important reasons. First, it corresponds to the procedure that most individuals actually follow. Typically, you start with all of your money in a bank account, only then considering how much to invest in something riskier that might offer a higher expected return. The logical step at this point is to consider other risky asset classes, such as stock, bonds, or real estate. This is an asset allocation decision. Second, in most cases, the asset allocation choice is far more important in determining overall investment performance than is the set of security selection decisions. Asset allocation is the primary determinant of the risk-return profile of the investment portfolio, and so it deserves primary attention in a study of investment policy.
3. This text offers a much broader and deeper treatment of futures, options, and other derivative security markets than most investments texts. These markets have become both crucial and integral to the financial universe and are the major sources of innovation in that universe. Your only choice is to become conversant in these markets—whether you are to be a finance professional or simply a sophisticated individual investor.

NEW IN THE FOURTH EDITION

Following is a summary of the content changes in the Fourth Edition:

Market Structure (Chapter 3)

We have updated our treatment of market microstructure in Chapter 3 with additional discussion of IPOs, underpricing, and the recent controversy over trading practices in the Nasdaq market. This discussion brings students up to date on trading practices in various security markets and provides an overview of the advantages and disadvantages of various forms of market organization. The chapter also contains additional material on ethics drawn from the CFA curriculum, and AIMR standards of professional conduct.

New Chapter on Mutual Funds and Other Investment Companies (Chapter 4)

Chapter 4 provides considerable detail on the organization of funds, reviews the costs and benefits associated with investing via mutual funds, examines empirical evidence on the investment performance of funds, and discusses how to find and interpret information on funds such as that presented in *Morningstar's* guide. This chapter thus provides the background necessary to understand this increasingly important market.

Expanded Discussion of Historical Rates of Return (Chapter 5)

In Chapter 5 of this edition, we have added tables of historical data regarding the performance of several asset classes. The new rate of return series give a richer set of benchmarks by which to evaluate investment performance. The expanded discussion of rate of return facilitates the interpretation of these data.

Efficient Diversification (Chapter 8)

Our chapter on Optimal Risky Portfolios (Chapter 8) has a new section in which we present an Excel spreadsheet model for deriving the efficient frontier and efficient portfolios along that frontier. The spreadsheet model makes our discussion of efficient diversification more concrete and shows the student how to build his or her own portfolio optimizer.

Multifactor Index Models (Chapter 10)

Our chapter on index models has been updated with an extensive discussion of multifactor models. The discussion shows why multifactor models can improve on single-factor models in terms of the ability to describe patterns of security returns, and provides an introduction to the potential importance of multiple sources of systematic risk that underlies modern asset pricing theory. We also provide an introduction to how such multifactor models might be tested.

Efficient Markets (Chapter 12)

Chapter 12's review of the empirical literature on the efficient markets hypothesis has been thoroughly updated. The new coverage highlights important new anomalies and attempts to provide balanced interpretations of them.

Empirical Evidence (Chapter 13)

Chapter 13 has been completely rewritten to reflect new research on the determinants of security returns. The chapter considers in detail the problems involved in testing equilibrium risk-return relationships. The new version of the chapter also considerably increases the discussion of the testing of multifactor models of security returns.

Fixed Income Management (Chapter 16)

A new discussion of convexity has been added to Chapter 16 of this edition. The new material highlights some of the problems encountered in fixed-income risk management and provides an introduction to more advanced techniques. The discussion appears in a modular format that can be easily skipped if the instructor views the material as too advanced.

Equity Markets (Chapter 18)

Chapter 18, which covers equity valuation, contains an expanded discussion of P/E ratios. These ratios are crucial to security analysis and the new coverage provides additional insight into how they may be interpreted.

Portfolio Management (Chapter 26)

This material, which focuses on many practical issues in formulating portfolio strategy, has been streamlined in this edition from two chapters into one. The current treatment eliminates duplication of material found elsewhere in the text, and enhances the readability of the material.

In addition to these changes, we have updated and edited our treatment of topics wherever it was possible to improve exposition or coverage.

ORGANIZATION AND CONTENT

The text is composed of seven sections that are fairly independent and may be studied in a variety of sequences. Since there is enough material in the book for a two-semester course, clearly a one-semester course will require the instructor to decide which parts to include.

Part I is introductory and contains important institutional material focusing on the financial environment. We discuss the major players in the financial markets, provide an overview of the types of securities traded in those markets, and explain how and where securities are traded. We also discuss in depth mutual funds and other investment companies, which have become an increasingly important means of investing for individual investors. Chapter 5 is a general discussion of risk and return, making the general point that historical returns on broad asset classes are consistent with a risk-return trade-off.

The material presented in Part I should make it possible for instructors to assign term projects early in the course. These projects might require the student to analyze in detail a particular group of securities. Many instructors like to involve their students in some sort of investment game and the material in these chapters will facilitate this process.

Parts II and III contain the core of modern portfolio theory. We focus more closely in Chapter 6 on how to describe investors' risk preferences. In Chapter 7 we progress to asset allocation and then in Chapter 8 to portfolio optimization.

After our treatment of modern portfolio theory in Part II, we investigate in Part III the implications of that theory for the equilibrium structure of expected rates of return on risky assets. Chapters 9 and 10 treat the capital asset pricing model and its implementation using index models, and Chapter 11 covers the arbitrage pricing theory. We complete Part II with a chapter on the efficient markets hypothesis, including its rationale as well as the evidence for and against it, and a chapter on empirical evidence concerning security returns. The empirical evidence chapter in this edition follows the efficient markets chapter so that the student can use the perspective of efficient market theory to put other studies on returns in context.

Part IV is the first of three parts on security valuation. This Part treats fixed-income securities—bond pricing (Chapter 14), term structure relationships (Chapter 15), and interest-rate risk management (Chapter 16). The next two Parts deal with equity securities and derivative securities. For a course emphasizing security analysis and excluding portfolio theory, one may proceed directly from Part I to Part III with no loss in continuity.

Part V is devoted to equity securities. We proceed in a “top down” manner, starting with the broad macroeconomic environment (Chapter 17), next moving on to equity valuation (Chapter 18), and then using this analytical framework, we treat fundamental analysis including financial statement analysis (Chapter 19).

Part VI covers derivative assets such as options, futures, swaps, callable and convertible securities. It contains two chapters on options and two on futures.

Finally, **Part VII** presents extensions of previous material. Topics covered in this Part include evaluation of portfolio performance (Chapter 24), portfolio management in an international setting (Chapter 25), a general framework for the implementation of investment strategy in a nontechnical manner modeled after the approach presented in CFA study materials (Chapter 26), risk management and hedging techniques (Chapter 27), and an overview of active portfolio management (Chapter 28).

PEDAGOGICAL FEATURES

This book contains several features designed to make it easy for the student to understand, absorb, and apply the concepts and techniques presented. Each chapter begins with an **overview**, which describes the material to be covered, and ends with a detailed **Summary**, which recapitulates the main ideas presented.

Learning investments is in many ways like learning a new language. Before one can communicate, one must learn the basic vocabulary. To facilitate this process, all new terms are presented in **boldface** type the first time we use them, and at the end of each chapter there is a **Key Terms** section listing the most important new terms introduced in that chapter. A **Glossary** of all the terms used appears at the end of the book.

Boxes containing short articles from business periodicals are included throughout the book. We think they enliven the text discussion with examples from the world of current events. We chose the boxed material on the basis of relevance, clarity of presentation, and consistency with good sense.

A unique feature of this book is the inclusion of **Concept Checks** in the body of the text. These self-test questions and problems enable the student to determine whether he or she has understood the preceding material and to reinforce that understanding. Detailed solutions to all these questions are provided at the end of each chapter.

These Concept Checks may be approached in a variety of ways. They may be skipped altogether in a first reading of the chapter with no loss in continuity. They can then be answered with any degree of diligence and application upon the second reading. Finally, they can serve as models for solving the end-of-chapter problems assigned by the instructor.

Each chapter also contains a list of **Selected Readings** that are annotated to guide the student toward useful sources of additional information in specific subject areas.

The **end-of-chapter Problems** progress from the simple to the complex. We strongly believe that practice in solving problems is a critical part of learning investments, so we have provided lots of problems. Many are taken from CFA examinations and therefore represent the kinds of questions that professionals in the field believe are relevant to the “real world.” These problems are identified by an icon in the text margin.

ANCILLARY MATERIALS

For the Instructor

Instructor's Manual The Instructor's Manual, prepared by Richard D. Johnson, Colorado State University, has been revised and improved in this edition. Each chapter includes a chapter overview, a review of learning objectives, an annotated chapter outline (organized to include the Transparency Masters/PowerPoint package), and teaching tips and insights. Transparency Masters are located at the end of each chapter.

PowerPoint Presentation Software These presentation slides, also developed by Richard D. Johnson, provide the instructor with an electronic format of the Transparency Masters. These slides follow the order of the chapters, but if you have PowerPoint software, you may customize the program to fit your lecture presentation.

Test Bank The Test Bank, prepared by Marilyn K. Wiley, Florida Atlantic University, has been revised to increase the quantity and variety of questions. Short-answer essay questions are also provided for each chapter to further test student comprehension and critical thinking abilities. The Test Bank is also available in computerized version. Test bank disks are available in Windows and Macintosh-compatible formats.

For the Student

The Wall Street Journal Edition Available through a unique arrangement with Dow Jones & Company, *The Wall Street Journal* Edition of *Investments* includes a 10-week subscription to *The Wall Street Journal* included in the price of the book. Instructors should contact their sales representative about ordering this special edition.

Solutions Manual The Solutions Manual, prepared by the authors, includes a detailed solution to each end-of-chapter problem. This manual is available for packaging with the text. Please contact your local Irwin/McGraw-Hill representative for further details on how to order the Solutions manual/textbook package.

Student Problem Manual An interactive and dynamic web-based student problem manual has been created to build up the quantitative skills of the students through chapter-by-chapter worked out problems; reinforcing of important concepts; internet hot links and corresponding exercises for each chapter; problems that require use of excel spreadsheets and financial calculators; and projects requiring interaction with the Irwin website and the World Wide Web. The package includes a printed component and access to the web-based site.

Morningstar StockTools Morningstar StockTools is a full-color, Windows-based CD-ROM that contains a database of nearly 8,000 stocks. There are 160 screenable fields for every stock that increases the potential for students to pinpoint the characteristics that they are looking for in an investment.

- Functional tools include screen, format, find, detail, and rank buttons. **Screen** for stocks that meet the criteria that you set, **format** allows you to view and print a custom display that meets your screening and ranking criteria, **find** helps you to cut through the huge database to get to a particular stock, and the **detail** function allows you to analyze an individual stock. The **rank** function helps you to quickly zero in on the stocks with the highest or lowest P/E Ratios or the largest or smallest market caps.
- The portfolio function is a tool that lets you analyze a portfolio of stocks like a mutual fund. It is a way to see how a group of stocks that you create interact together, see how risky the portfolio is, and play “what if” scenarios by moving and removing stocks from the mix.
- The performance tools include total returns and growth rates. They measure the magnitude of a stock’s return or of a company’s revenue over a given period.
- Segment tools include the business segment analysis and regional breakdown.
- Contextual tools allow you to compare a stock with other stocks, industries, indexes, and a variety of other benchmarks.

The Innovative Investor, Version 2.0 Prepared by Matthew Will, Dennis Foster, and David Shimko, this software is available in Lotus and a new Excel version. These templates are designed to provide students with quick access to difficult calculations associated with the analysis of securities such as stocks, bonds, callable and convertible securities, options, and futures, as well as to facilitate the analytics underlying asset allocation, performance evaluation, and other applications. All spreadsheets come complete with comprehensive “What-if” analysis, in addition to automatic graphing and printing capabilities. These user-friendly capsules are designed to solve many problems a student of investments might encounter, beginning with problems available in the User’s Manual, but extending as well to problems you may encounter in a career as a financial analyst or sophisticated investor. Together with the text, the software enables students not only to process calculations, but to ask questions and build upon the intuition established in the text.

ACKNOWLEDGMENTS

Throughout the development of this text, experienced instructors have provided critical feedback and suggestions for improvement. These individuals deserve a special thanks for their valuable insights and contributions. The following instructors played a vital role in the development of this and previous editions of *Investments*:

Scott Besley
University of Florida
 John Binder
University of Illinois at Chicago
 Paul Bolster
Northeastern University

Phillip Braun
Northwestern University
 L. Michael Couvillion
Plymouth State University
 Anna Craig
Emory University

- | | |
|---|--|
| David C. Distad | Allen D. Morton |
| <i>University of California at Berkeley</i> | <i>Western Connecticut State University</i> |
| Craig Dunbar | Ronald Moy |
| <i>University of Western Ontario</i> | <i>St. John's University</i> |
| Michael C. Ehrhardt | Rick Meyer |
| <i>University of Tennessee at Knoxville</i> | <i>University of South Florida</i> |
| David Ellis | Don B. Panton |
| <i>Babson College</i> | <i>University of Texas at Arlington</i> |
| Greg Filbeck | Robert Pavlik |
| <i>University of Toledo</i> | <i>Southwest Texas State</i> |
| Jeremy Goh | Herbert Quigley |
| <i>Washington University</i> | <i>University of D.C.</i> |
| John M. Griffin | Speima Rao |
| <i>Arizona State University</i> | <i>University of Southwestern Louisiana</i> |
| Mahmoud Haddad | Leonard Rosenthal |
| <i>Wayne State University</i> | <i>Bentley College</i> |
| Robert G. Hansen | Eileen St. Pierre |
| <i>Dartmouth College</i> | <i>University of Northern Colorado</i> |
| Joel Hasbrouck | Anthony Sanders |
| <i>New York University</i> | <i>Ohio State University</i> |
| Andrea Heuson | John Settle |
| <i>University of Miami</i> | <i>Portland State University</i> |
| Shalom J. Hochman | Edward C. Sims |
| <i>University of Houston</i> | <i>Western Illinois University</i> |
| A. James Ifflander | Steve L. Slezak |
| <i>A. James Ifflander and Associates</i> | <i>University of North Carolina at Chapel Hill</i> |
| Robert Jennings | Keith V. Smith |
| <i>Indiana University</i> | <i>Purdue University</i> |
| Richard D. Johnson | Patricia B. Smith |
| <i>Colorado State University</i> | <i>University of New Hampshire</i> |
| Susan D. Jordan | Laura T. Starks |
| <i>University of Kentucky</i> | <i>University of Texas</i> |
| G. Andrew Karolyi | Manuel Tarrazo |
| <i>Ohio State University</i> | <i>University of San Francisco</i> |
| Josef Lakonishok | Jack Treynor |
| <i>University of Illinois at Champaign/Urbana</i> | <i>Treynor Capital Management</i> |
| Dennis Lasser | Charles A. Trzincka |
| <i>Binghamton University</i> | <i>SUNY Buffalo</i> |
| Christopher K. Ma | Gopala Vasudevan |
| <i>Texas Tech University</i> | <i>Suffolk University</i> |
| Anil K. Makhija | Joseph Vu |
| <i>University of Pittsburgh</i> | <i>De Paul University</i> |
| Steven Mann | Simon Wheatley |
| <i>University of South Carolina</i> | <i>University of Chicago</i> |
| Deryl W. Martin | Marilyn K. Wiley |
| <i>Tennessee Technical University</i> | <i>Florida Atlantic University</i> |
| Jean Masson | James Williams |
| <i>University of Ottawa</i> | <i>California State University at Northridge</i> |

Tony R. Wingler
University of North Carolina at Greensboro
Hsiu-Kwang Wu
University of Alabama

Thomas J. Zwirlein
University of Colorado at Colorado Springs

For granting us permission to include many of their examination questions in the text, we are grateful to the Institute of Chartered Financial Analysts.

Much credit is due also to the development and production team: our special thanks go to Shelley Kronzek, Associate Editor; Michele Janicek, Development Editor; Jean Lou Hess, Senior Project Manager; and Crispin Prebys, Senior Designer.

Finally, we thank Judy, Hava, and Sheryl, who contributed to the book with their support and understanding.

Zvi Bodie
Alex Kane
Alan J. Marcus

PART ONE

INTRODUCTION 1

- 1 The Investment Environment 2
- 2 Markets and Instruments 29
- 3 How Securities Are Traded 67
- 4 Mutual Funds and Other Investment Companies 101
- 5 History of Interest Rates and Risk Premiums 127

PART TWO

PORTFOLIO THEORY 147

- 6 Risk and Risk Aversion 148
- 7 Capital Allocation between the Risky Asset and the Risk-Free Asset 178
- 8 Optimal Risky Portfolios 201

PART THREE

EQUILIBRIUM IN CAPITAL MARKETS 249

- 9 The Capital Asset Pricing Model 250
- 10 Single-Index and Multifactor Models 281
- 11 Arbitrage Pricing Theory 307
- 12 Market Efficiency 328
- 13 Empirical Evidence on Security Returns 370

PART FOUR

FIXED-INCOME SECURITIES 399

- 14 Bond Prices and Yields 400
- 15 The Term Structure of Interest Rates 435
- 16 Fixed-Income Portfolio Management 460

PART FIVE

SECURITY ANALYSIS 501

- 17 Macroeconomic and Industry Analysis 502
- 18 Equity Valuation Models 530
- 19 Financial Statement Analysis 570

PART SIX

OPTIONS, FUTURES, AND OTHER DERIVATIVES 607

- 20 Options Markets: Introduction 608
- 21 Option Valuation 655
- 22 Futures Markets 689
- 23 Futures and Swaps: A Closer Look 716

PART SEVEN

APPLIED PORTFOLIO MANAGEMENT 747

- 24 Portfolio Performance Evaluation 748
- 25 International Diversification 786
- 26 The Process of Portfolio Management 810
- 27 Risk Management and Hedging 848
- 28 The Theory of Active Portfolio Management 867

Appendix A

Quantitative Review 891

Appendix B

CFA Citations 928

Glossary 930

Name Index 943

Subject Index 949

PART ONE

INTRODUCTION 1

CHAPTER 1

THE INVESTMENT ENVIRONMENT 2

- 1.1 Real Assets versus Financial Assets 3
- 1.2 Markets and the Economy 5
 - Consumption Timing 5
 - Allocation of Resources 5
 - Separation of Ownership and Management 6
- 1.3 Clients of the Financial System 6
 - The Household Sector 6
 - The Business Sector 7
 - The Government Sector 8
- 1.4 The Environment Responds to Clientele Demands 9
 - Financial Intermediation 9
 - Investment Banking 11
 - Financial Innovation and Derivatives 11
 - Response to Taxation and Regulation 13
- 1.5 Markets and Market Structure 15
- 1.6 Ongoing Trends 16
 - Globalization 16
 - Securitization 18
 - Credit Enhancement 20
 - Financial Engineering 20
- 1.7 On the Relationship between Households and Businesses 21
 - Summary 24

CHAPTER 2

MARKETS AND INSTRUMENTS 29

- 2.1 The Money Market 30
 - Treasury Bills 31
 - Certificates of Deposit 34
 - Commercial Paper 34
 - Bankers' Acceptances 34
 - Eurodollars 34
 - Repos and Reverses 35
 - Federal Funds 35
 - Brokers' Calls 36

The LIBOR Market 36

Yields on Money Market Instruments 36

2.2 The Fixed-Income Capital Market 36

Treasury Notes and Bonds 37

Federal Agency Debt 38

Municipal Bonds 40

Corporate Bonds 42

Mortgages and Mortgage-Backed Securities 43

2.3 Equity Securities 46

Common Stock as Ownership Shares 46

Characteristics of Common Stock 46

Stock Market Listings 47

Preferred Stock 48

2.4 Stock and Bond Market Indexes 48

Stock Market Indexes 48

Dow Jones Averages 50

Standard & Poor's Indexes 53

Other Market-Value Indexes 55

Foreign and International Stock Market Indexes 57

Bond Market Indicators 57

2.5 Derivative Markets 59

Options 59

Futures Contracts 60

Summary 62

CHAPTER 3

HOW SECURITIES ARE TRADED 67

3.1 How Firms Issue Securities 68

Investment Bankers and Underwriting 68

Shelf Registration 69

Initial Public Offerings 69

3.2 Where Securities Are Traded 72

The Secondary Markets 72

The Over-the-Counter Market 74

Third and Fourth Markets 75

The National Market System 75

3.3 Trading on Exchanges 76

The Participants 76

Types of Orders	76
Specialists and the Execution of Trades	78
Block Sales	80
The DOT System	80
Settlement	80
3.4 Trading on the OTC Market	81
Market Structure in Other Countries	83
The London Stock Exchange	84
The Tokyo Stock Exchange	84
3.5 Trading Costs	85
3.6 Buying on Margin	87
3.7 Short Sales	89
3.8 Regulation of Securities Markets	91
Government Regulation	91
Self-Regulation and Circuit Breakers	92
Insider Trading	93
Summary	95
CHAPTER 4	
MUTUAL FUNDS AND OTHER INVESTMENT COMPANIES	101
4.1 Investment Companies	102
4.2 Types of Investment Companies	102
Unit Investment Trusts	103
Managed Investment Companies	103
Other Investment Organizations	105
4.3 Mutual Funds	106
Investment Policies	106
How Funds Are Sold	109
4.4 Costs of Investing in Mutual Funds	110
Fee Structure	110
Fees and Mutual Fund Returns	111
4.5 Taxation of Mutual Fund Income	113
4.6 Mutual Fund Investment Performance: A First Look	115
4.7 Information on Mutual Funds	119
Summary	123
CHAPTER 5	
HISTORY OF INTEREST RATES AND RISK PREMIUMS	127
5.1 Determinants of the Level of Interest Rates	128
Real and Nominal Rates of Interest	128
The Equilibrium Real Rate of Interest	129
The Equilibrium Nominal Rate of Interest	130

Bills and Inflation, 1953–1996	131
Taxes and the Real Rate of Interest	131
5.2 Risk and Risk Premiums	132
5.3 The Historical Record	134
Bills, Bonds, and Stocks, 1926–1996	134
5.4 Real versus Nominal Risk	138
Summary	140
Appendix: Continuous Compounding	144

PART TWO

PORTFOLIO THEORY 147

CHAPTER 6

RISK AND RISK AVERSION 148

6.1 Risk and Risk Aversion 149

Risk with Simple Prospects 149

Risk, Speculation, and Gambling 150

Risk Aversion and Utility Values 151

6.2 Portfolio Risk 156

Asset Risk versus Portfolio Risk 156

A Review of Portfolio Mathematics 156

Summary 161

Appendix A: A Defense of Mean-Variance Analysis 166

Describing Probability Distributions 166

Normal and Lognormal Distributions 170

Appendix B: Risk Aversion and Expected Utility 173

CHAPTER 7

CAPITAL ALLOCATION BETWEEN THE RISKY ASSET AND THE RISK-FREE ASSET 178

7.1 Capital Allocation across Risky and Risk-Free Portfolios 179

7.2 The Risk-Free Asset 181

7.3 Portfolios of One Risky Asset and One Risk-Free Asset 182

7.4 Risk Tolerance and Asset Allocation 186

7.5 Passive Strategies: The Capital Market Line 190

Summary 193

CHAPTER 8

OPTIMAL RISKY PORTFOLIOS 201

8.1 Diversification and Portfolio Risk 202

8.2 Portfolios of Two Risky Assets 203

8.3 Asset Allocation with Stocks, Bonds, and Bills	211	Estimating the Index Model	285
The Optimal Risky Portfolio with Two Risky Assets and a Risk-Free Asset	211	The Index Model and Diversification	287
8.4 The Markowitz Portfolio Selection Model	217	10.2 The CAPM and the Index Model	289
Security Selection	217	Actual Returns versus Expected Returns	289
8.5 A Spreadsheet Model	221	The Index Model and Realized Returns	290
Calculation of Expected Returns and Variance	221	The Index Model and the Expected Return–Beta Relationship	291
Capital Allocation and the Separation Property	225	10.3 The Industry Version of the Index Model	292
Asset Allocation and Security Selection	227	Predicting Betas	296
8.6 Optimal Portfolios with Restrictions on the Risk-Free Asset	228	10.4 Multifactor Models	297
Summary	231	Empirical Foundation of Multifactor Models	297
Appendix A: The Power of Diversification	240	Theoretical Foundations of Multifactor Models	299
Appendix B: The Insurance Principle: Risk-Sharing versus Risk-Pooling	243	Empirical Models and the ICAPM	300
Appendix C: The Fallacy of Time Diversification	245	Summary	301
PART THREE		CHAPTER 11	
EQUILIBRIUM IN CAPITAL MARKETS	249	ARBITRAGE PRICING THEORY	307
CHAPTER 9		11.1 Arbitrage Opportunities and Profits	308
THE CAPITAL ASSET PRICING MODEL	250	11.2 The APT and Well-Diversified Portfolios	311
9.1 The Capital Asset Pricing Model	251	Well-Diversified Portfolios	311
Why Do All Investors Hold the Market Portfolio?	253	Betas and Expected Returns	313
The Passive Strategy Is Efficient	254	The Security Market Line	316
The Risk Premium of the Market Portfolio	254	11.3 Individual Assets and the APT	317
Expected Returns on Individual Securities	255	11.4 The APT and the CAPM	319
The Security Market Line	259	11.5 A Multifactor APT	319
9.2 Extensions of the CAPM	264	Summary	321
The CAPM with Restricted Borrowing: The Zero-Beta Model	264	CHAPTER 12	
Lifetime Consumption: The CAPM with Dynamic Programming	267	MARKET EFFICIENCY	328
9.3 The CAPM and Liquidity: A Theory of Illiquidity Premiums	267	12.1 Random Walks and the Efficient Market Hypothesis	329
Summary	273	Competition as the Source of Efficiency	330
CHAPTER 10		Versions of the Efficient Market Hypothesis	330
SINGLE-INDEX AND MULTIFACTOR MODELS	281	12.2 Implications of the EMH for Investment Policy	331
10.1 A Single-Index Security Market	282	Technical Analysis	331
Systematic Risk versus Firm-Specific Risk	282	Fundamental Analysis	336
		Active versus Passive Portfolio Management	337
		The Role of Portfolio Management in an Efficient Market	338
		12.3 Event Studies	338
		12.4 Are Markets Efficient?	342
		The Issues	342