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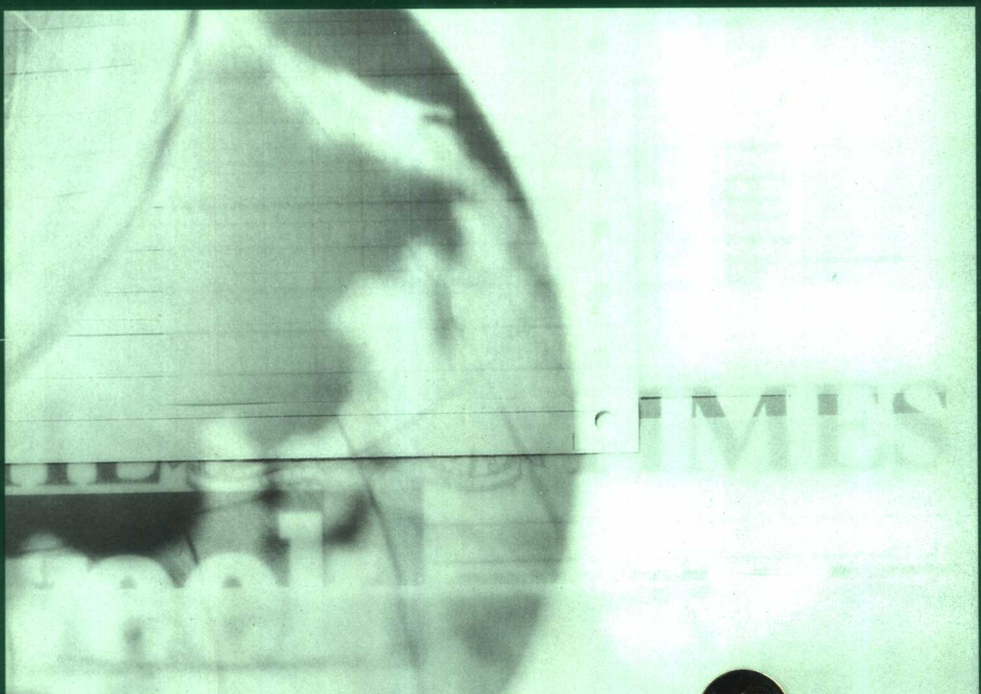

INVESTMENTS

Fourth Edition

FOURTH EDITION

INVESTMENTS

ZVI BODIE
BOSTON UNIVERSITY

ALEX KANE
UNIVERSITY OF CALIFORNIA, SAN DEIGO

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BOSTON COLLEGE

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PREFACE

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 intructor 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 test 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.

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Zvi Bodie
Alex Kane
Alan J. Marcus

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