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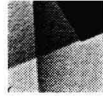
Second Edition



ZVI BODIE

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INVESTMENTS

Second Edition

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To our families with love and gratitude.

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Zvi Bodie is professor of finance and economics at the Boston University School of Management. He is the former director of Boston University's Chartered Financial Analysts Examination Review Program and has served as a consultant to many private and governmental organizations. Professor Bodie was director of the National Bureau of Economic Research Project on Financial Aspects of the U.S. Pension System, and he is a member of the Pension Research Council of The Wharton School. He is also currently a member of the Financial Accounting Standards Board Task Force on Interest Methods. Professor Bodie is widely published in leading professional journals, and his previous books include *Pensions in the U.S. Economy*, *Issues in Pension Economics*, *Financial Aspects of the U.S. Pension System*, and most recently *Pensions and the Economy: Sources, Uses and Limitations of Data*.

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Alex Kane is a professor of finance and economics at the Graduate School of International Relations and Pacific Studies at the University of California, San Diego. The author of many articles published in finance and management journals, Professor Kane's research is mainly in the areas of portfolio management, capital markets, and corporate finance. With a newly designed experimental laboratory which serves as a training center for decision makers, Professor Kane has been studying the formation of price expectations and the structure of equilibrium asset prices. Professor Kane has been named the Yamaichi Visiting Professor of Finance at the University of Tokyo for 1991.

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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 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.

Since 1983 we have participated in an annual review program in Boston for candidates from all over the world preparing for the Chartered Financial Analyst examinations. From its inception in 1963 the CFA program has come to symbolize high standards of professionalism in the investment community. The CFA curriculum represents the consensus of a committee of distinguished scholars and practitioners regarding the core of knowledge required by the investment professional.

This book has benefited from our continuing CFA experience in two ways. First, we have incorporated in the text much of the content of the readings and other study materials in the official CFA curriculum. As a result, the book

includes some material not found in most other investments texts. Most notably, Part VIII presents material on portfolio management principles and techniques for both the individual and institutional investor that stems largely from the CFA curriculum. Second, we have included questions from CFA examinations in the end-of-chapter problem sets throughout the book.



Realistic Presentation of Modern Portfolio Theory

The exposition of modern portfolio theory in this text differs from its presentation in all other major investments texts in that we develop the basic model starting with a risk-free asset such as a bank certificate of deposit or a U.S. Treasury bill, and a single risky asset such as a common stock mutual fund.¹ Not until later do we add other risky assets. Other texts develop the model by first assuming that the investor has to choose from two risky assets; only later do they introduce the possibility of investing in a risk-free asset. Ultimately both approaches reach the same end point, which is a model in which there are many risky assets in addition to a risk-free asset.

We think our approach is better for two important reasons. First, it corresponds to the actual procedure that most individual investors follow. Typically, one starts with all of one's money invested in a bank account and only then considers how much to invest in something riskier that may offer the prospect of a higher expected return. The next logical step is to consider the addition of other risky assets such as real estate or gold, which requires determining whether the benefits of such increased diversification are worth the additional transaction costs involved in including them in one's portfolio.

The second advantage of our approach is that it vastly simplifies exposition of the mathematics for deriving the menu of risk-return combinations open to the investor. Portfolio optimization techniques are mathematically complex, ultimately requiring a computer. Anything that can help to simplify their presentation should thus be welcome. In short, we believe our approach is both more realistic and analytically simpler than the conventional one.



Changes in the Second Edition

The second edition introduces treatments of several new topics. What follows is a summary of major innovations; however, we cannot mention in this brief preface all of the additions.

¹We define and discuss mutual funds in Chapter 3. For now it is sufficient to know that a common stock mutual fund is a diversified portfolio of stocks in which an investor can invest as much money as desired.

Market Structure

We have expanded our treatment of issues of market microstructure, with particular emphasis in Chapter 3 on quality of execution and the current competition between the New York Stock Exchange and its competitors for market share. In addition, we have added a new analysis in Chapter 8 of the effect of liquidity on expected security returns. This substantial addition to our analysis of equilibrium in capital markets is unique to this text, and addresses an issue that traders have long recognized as a major issue.

Risk and Return

We have updated our treatment of risk and return relationships, including a new discussion of time-varying volatility. Chapter 12 on market efficiency covers the considerable literature that has appeared since the last edition, with emphasis on the issue of the predictability of stock market returns.

Equity and Fixed-Income Management

The analysis of fixed-income management in Chapter 15 now includes considerable coverage of bond indexing. A new chapter (Chapter 16) on macroeconomics, industry analysis, and company life cycles has been added to enhance our coverage of security analysis in the equity market. Chapter 17 on equity valuation has been revised to further emphasize practical application of the techniques and models actually used by security analysts. Chapter 18 on financial statement analysis has been revised to include new discussions of how analysts use cash flow statements.

Derivative Markets

Chapters 19 and 20 on options markets have been reorganized. Chapter 19 provides an overview of option markets and trading strategies, and provides new coverage on financial engineering. Chapter 20 follows this overview with analyses of option valuation concepts and models. Chapter 22 on futures markets provides new coverage of swaps and swap pricing.

Active Management

Chapter 25 is a new chapter that provides a discussion of hedging techniques. Applications are provided of hedges against foreign exchange risk, interest rate risk, stock market risk, and hedging strategies used by options traders. The discussion of the implications of hedging demands on market equilibrium contains some of the material on the multifactor CAPM that appeared in the first edition of the text.

Players and Strategies

Chapter 27 on managing client portfolios contains a revised discussion of hedging against inflation that reflects new developments in this field. Chapter

28 on managing retirement assets and pension funds has been revised to emphasize the investment motives and unique trading strategies appropriate to various pension funds and retirement savings accounts.



Pedagogical Features and Ancillary Materials

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 states the objectives of the chapter and 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 of 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. The article in the Prologue from *Business Week* on the invasion of Wall Street by so-called rocket scientists is an example. 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 the book.

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.” The **Student Problems Manual**, which accompanies the text, provides many more practice problems with solutions.

Software is available for use with the text. First, it is designed to enhance the student's understanding of the material presented in the chapter. Second, it shows that the concepts and techniques presented in the chapter can be easily implemented in real-world applications by using the computer.

Many schools now make PC laboratories available for individual or class use. We have found that for some students the integration of the use of the computer into the investments course either as a mandatory or a voluntary component adds a great deal. The software diskette provides a basic set of programs and data that the student can actually use for analysis or for personal investing.

The **Instructor's Manual** that accompanies this text contains detailed solutions to the end-of-chapter questions and problems, and a **Test Bank** contains multiple-choice problems.



Acknowledgments

The development of this book involved the efforts of many dedicated professionals. Our thanks go to Steve Ross, who persuaded us that writing such a text was an endeavor worth undertaking. A distinguished panel of reviewers read the first draft, after which a focus group of selected reviewers met to discuss its content in detail. Their suggestions were incorporated in the second draft, which likewise was reviewed by a highly qualified panel. The text was extensively class tested by experienced instructors, and throughout the production process the material was examined by technical reviewers with specialized expertise in the various subject areas.

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