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BRADFORD D. JORDAN



Fundamentals *of* Investments

Valuation & Management
second edition

Fundamentals of Investments

Valuation and Management

Second Edition

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University of Kentucky



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FUNDAMENTALS OF INVESTMENTS: VALUATION AND MANAGEMENT

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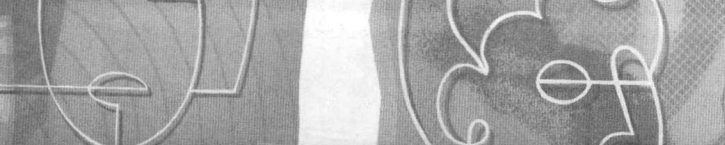
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Fundamentals of Investments

Valuation and Management

The Irwin/McGraw-Hill Series in Finance, Insurance and Real Estate

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**To my parents, Charles and Clotilda,
who sacrificed for my benefit; I miss them dearly.**

CJC

**To my late father, S. Kelly Jordan, Sr.,
a great stock picker.**

BDJ



About the Authors

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Charles J. Corrado is Professor and Chair of Finance at the University of Auckland in New Zealand—Kia Ora! He has taught in the area of investments throughout his academic career at the undergraduate, graduate, and doctoral levels. Professor Corrado has published numerous research articles on topics related to fixed income securities, financial derivatives, international finance, and statistical methods in financial markets research.

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Bradford D. Jordan is National City Bank Professor of Finance at the University of Kentucky. He has a long-standing interest in both applied and theoretical issues in investments, and has extensive experience teaching all levels of investments. Professor Jordan has published numerous research articles on issues such as valuation of fixed income securities, tax effects in investments analysis, the behavior of security prices, IPO valuation, and pricing of exotic options. He is co-author of *Fundamentals of Corporate Finance, Sixth Edition*, and *Essentials of Corporate Finance, Third Edition*, two of the most widely used finance textbooks in the world.

Preface

So why *did* we write this book?

As we toiled away, we asked ourselves this question many times, and the answer was always the same: *Our students made us.*

Traditionally, investments textbooks tend to fall into one of two camps. The first type has a greater focus on portfolio management and covers a significant amount of portfolio theory. The second type is more concerned with security analysis and generally contains fairly detailed coverage of fundamental analysis as a tool for equity valuation. Today, most texts try to cover all the bases by including some chapters drawn from one camp and some from another.

The result of trying to cover everything is either a very long book or one that forces the instructor to bounce back and forth between chapters. The result is frequently a noticeable lack of consistency in treatment. Different chapters have completely different approaches: Some are computational, some are theoretical, and some are descriptive. Some do macroeconomic forecasting, some do mean-variance portfolio theory and beta estimation, and some do financial statements analysis. Options and futures are often essentially tacked on the back to round out this disconnected assortment.

The goal of these books is different from the goal of our students. Our students told us they come into an investments course wanting to learn how to make investment decisions. As time went by, we found ourselves supplying more and more supplemental materials to the texts we were using, and constantly varying chapter sequences while chasing this elusive goal. We finally came to realize that the financial world had changed tremendously, and investments textbooks had fallen far behind in content and relevance.

What we really wanted, and what our students really needed, was a book that would do several key things:

- Focus on the students as investment managers by giving them information they can act on instead of concentrating on theories and research without the proper context.
- Offer strong, consistent pedagogy, including a balanced, unified treatment of the main types of financial investments as mirrored in the investment world.
- Organize topics in a way that would make them easy to apply—whether to a portfolio simulation or to real life—and support these topics with hands-on activities.

We made these three goals the guiding principles in writing this book. The next several sections explain our approach to each and why we think they are so important.

Who Is This Book For?

This book is aimed at introductory investments classes with students who have relatively little familiarity with investments. A typical student may have taken a principles of finance class and had some exposure to stocks and bonds, but not much beyond the basics. The introductory investments class is often a required course for finance majors, but students from other areas often take it as an elective. One fact of which we are acutely aware is that this may be the only investments class many students will ever take.

We intentionally wrote this book in a relaxed, informal style that engages the student and treats him or her as an active participant rather than a passive information absorber. We think the world of investments is exciting and fascinating, and we hope to share our considerable enthusiasm for investing with the student. We appeal to intuition and basic principles whenever possible because we have found that this approach effectively promotes understanding. We also make extensive use of examples throughout, drawing on “real world” material and familiar companies wherever appropriate.

By design, the text is not encyclopedic. As the table of contents indicates, we have a total of 19 chapters. Chapter length is about 30–40 pages, so the text is aimed at a single-term course; most of the book can be covered in a typical quarter or semester.

Aiming the book at a one semester course necessarily means some picking and choosing, both with regard to topics and depth of coverage. Throughout, we strike a balance by introducing and covering the essentials while leaving some of the detail to follow-up courses in security analysis, portfolio management, and options and futures.

How Is This Book Relevant to the Student?

Fundamental changes in the investments universe drive our attention to relevance. The first major change is that individuals are being asked to make investment decisions for their own portfolios more often than ever before. There is, thankfully, a growing recognition that traditional “savings account” approaches to investing are decidedly inferior. At the same time, the use of employer-sponsored “investment accounts” has expanded enormously. The second major change is that the investments universe has exploded with an ever-increasing number of investment vehicles available to individual investors. As a result, investors must choose from an array of products, many of which are very complex, and they must strive to choose wisely as well.

Beyond this, students are more interested in subjects that affect them directly (aren’t we all). By taking the point of view of the student as an investor, we are better able to illustrate and emphasize the relevance and importance of the material.

Our approach is evident in the table of contents. Our first chapter is motivational; we have found that this material effectively “hooks” students and even motivates a semester-long discourse on risk and return. Our second chapter answers the student’s next natural question: “How do I get started investing and how do I buy and sell securities?” The third chapter surveys the different types of investments available. After only three chapters, very early in the term, students have learned something about the risks and rewards from investing, how to get started investing, and what investment choices are available.

We close the first part of the text with a detailed examination of mutual funds. Without a doubt, mutual funds have become the most popular investment vehicles for individual investors. There are now more mutual funds than there are stocks on the NYSE! Given the size and enormous growth in the mutual fund industry, this material is important for investors. Even so, investment texts typically cover mutual funds in a cursory way, often banishing the material to a back chapter under the obscure (and obsolete) head-

ing of “investment companies.” Our early placement lets students quickly explore a topic they have heard a lot about and are typically very interested in.

How Does This Book Maintain a Consistent, Unified Treatment?

In most investments texts, depth of treatment and presentation vary dramatically from instrument to instrument, stranding the student without an overall framework for understanding the many types of investments. We stress early on that there are essentially only four basic types of financial investments—stocks, bonds, options, and futures. In parts 2 through 5, our simple goal is to take a closer look at each of these instruments. We take a unified approach to each by answering these basic questions:

1. What are the essential features of the instrument?
2. What are the possible rewards?
3. What are the risks?
4. What are the basic determinants of investment value?
5. For whom is the investment appropriate and under what circumstances?
6. How is the instrument bought and sold and how does the market for the instrument operate?

By covering investment instruments in this way, we teach the students which questions to ask when looking at any potential investment.

Unlike other introductory investments texts, we devote several chapters beyond the basics to the different types of fixed-income investments. Students are often surprised to learn that the fixed-income markets are so much bigger than the equity markets and that money management opportunities are much more common in the fixed-income arena. Possibly the best way to see this is to look at recent CFA exams and materials and note the extensive coverage of fixed-income topics. We have placed these chapters toward the back of the text because we recognize not everyone will want to cover all this material. We have also separated the subject into several shorter chapters to make it more digestible for students and to allow instructors more control over what is covered.

How Does This Book Allow Students to Apply the Investments Knowledge They Learn?

After studying this text, students will have the basic knowledge needed to move forward and actually act on what they have learned. We have developed two features to encourage making decisions as an investment manager. Learning to make good investment decisions comes with experience, while experience (regrettably) comes from making bad investment decisions. As much as possible, we press our students to get those bad decisions out of their systems before they start managing real money!

Not surprisingly, most students don't know how to get started buying and selling securities. We have learned that providing some structure, especially with a portfolio simulation, greatly enhances the experience. Therefore, we first have a series of *Get Real!* boxes. These boxes (at the end of each chapter) usually describe actual trades for students to explore. The intention is to show students how to gain real experience with the principles and instruments covered in the chapter. The second feature is a series of

Stock-Trak exercises that take students through specific trading situations using *Stock-Trak Portfolio Simulations*.

Because we feel that portfolio simulations are so valuable, we have taken steps to assist instructors who, like us, plan to integrate portfolio simulations into their courses. Beyond the features mentioned above, we have organized the text so that the essential material needed before participating in a simulation is covered at the front of the book. Most notably, with every book, we have included a *free* subscription to *Stock-Trak Portfolio Simulations*. *Stock-Trak* is the leading provider of investment simulation services to the academic community; providing it free represents a significant cost savings to students. To our knowledge, ours is the first investments text to directly offer a full-featured online brokerage account simulation with the book at no incremental cost.

How Does the Second Edition of This Book Expand upon the Goals Described Above?

Extensive user feedback has led to major improvements and added features in the second edition of *Fundamentals of Investments: Valuation and Management*. Many users asked us to add spreadsheet examples to illustrate complex numerical calculations. We thought about the best way to do this and decided to use screenshots of Excel™ worksheets with worked examples. By using actual screenshots, students are able to see exactly how to create their own worksheets. These exhibits, called *Spreadsheet Analysis*, are spread throughout the text. For example, a worksheet in Chapter 10 shows how to calculate Macaulay duration for a bond, and Chapter 15 contains a worksheet illustrating how to calculate Black-Scholes option prices. Worksheets in Chapter 19 show how to calculate correlation coefficients and an optimal Sharpe ratio. Similar worksheet examples are included in other chapters to illustrate how a spreadsheet can be used to solve many numerical calculation problems in finance.

Many users also asked that we include more Internet content, believing, as we do, that, despite the dot-com crash, the Internet will continue to be an essential tool for investment professionals. Our first response to the call for more Internet content was to place Internet addresses for useful investments websites throughout the page margins in each chapter. We also suggest some useful websites in the *Get Real!* boxes at the end of each chapter and in the *Stock-Trak* sections. As a second response, we have included a number of screenshots, called *Work the Web*, illustrating how to access specific features of selected websites. For example, screenshots in Chapter 3 illustrate how to look up the ticker symbol for a stock from the company's name. The ticker symbol can then be used to look up the stock's price and other information about the stock. Chapter 6 contains screenshots illustrating how to access financial information about companies from the large financial database available through the Yahoo! Finance website. From this source students can get betas, growth rates, price ratios, analysts' opinions, and more for use in making investment decisions. Similar screenshots in Chapters 10 and 11 illustrate how to search through a popular Internet database of U.S. Treasury and corporate bonds for bonds matching specific selection criteria. Chapter 14 contains screenshots showing how to look up the prices of options on a stock using the stock's ticker symbol.

We also listened to many user suggestions on how to distribute material on international investments throughout the text. Based on these suggestions, international investments material formerly included in a single chapter has been redistributed throughout the text. For example, the discussion of World Equity Benchmark Shares (WEBS) is now included in the discussion of Exchange Traded Funds (ETFs) in Chapter 4, and

American Depository Receipts (ADRs) are now covered in Chapter 5. The topic of international diversification is now discussed in Chapter 17.

To replace previous content, Chapter 19 is now devoted to two important and related topics: investment performance evaluation and financial risk management. A completely new feature included in Chapter 19 is the discussion of Value-at-Risk (VaR)TM. In recent years, Value-at-Risk has become a widely adopted standard for financial risk management in many financial institutions. However, the topic has not yet appeared in investments texts, so this is the first book to cover the subject. We predict that other texts will be quick to follow.

Of course, many other smaller changes have been made throughout the text. The number of numerical examples has been increased and spread across more chapters, and end-of-chapter questions and problems have been improved and extended. Additionally, many *Wall Street Journal* article exhibits have been updated, and recent changes in financial markets and instruments have been added throughout.

Walkthrough

Pedagogical Features

From your feedback, we have included many pedagogical features in this text that will be valuable learning tools for your students. This walkthrough highlights some of the most important elements.

A Brief History of Risk and Return

Who wants to be a millionaire? Actually, anyone can retire as a millionaire. How? Consider this: Suppose you, at the age of 25, begin saving \$3,000 per year. Forty years later, you retire at age 65. How much will you have? The answer might surprise you. If you earn 8 percent per year, you will have almost \$800,000. But, if you earn 12 percent, you will have well over \$2 million! Are these numbers realistic? Based on the history of financial markets, the answer appears to be yes. For example, over the last 75 years, the widely followed Standard & Poor's index of large-company common stocks has actually yielded about 13 percent per year. ■

The study of investments could begin in many places. After thinking it over, we decided that a brief history lesson is in order, so we start our discussion of risk and return by looking back at what has happened to investors in U.S. financial markets since 1925. In 1931, for example, the stock market lost 43 percent of its value. Just two years later, the market reversed itself and gained 54 percent. In more recent times, the stock market lost about 25 percent of its value on October 19, 1987, alone, and it gained almost 40 percent in 1995. What lessons, if any, should investors learn from such shifts in the stock market? We explore the last seven decades of market history to find out.

Chapter Openers

These one-paragraph introductions for each chapter present facts and misconceptions that may surprise you. An explanation is more fully developed in the chapter.

Key Terms

Key terms are indicated in bold and defined in the margin. The running glossary in the margin helps students quickly review the basic terminology for the chapter.

market timing Buying and selling in anticipation of the overall direction of a market.

asset allocation The distribution of investment funds among broad classes of assets.

Investment Management A basic decision that you and every other investor must make is whether you will manage your investments yourself or hire someone else to do it. At the one extreme, you can open an account with a broker and make all of the buy and sell decisions yourself. At the other extreme, you can invest all of your money in a managed account, such as a wrap account, and make no buy and sell decisions at all.

Often investors partially manage their investments themselves and partially use professional managers. For example, you might divide your money between, say, four different mutual funds. In this case, you have hired four different money managers. However, you decided what types of funds to buy, you chose the particular funds within each type, and you decided how to divide your money between the funds.

It might appear that managing your money by yourself is the cheapest way to go because you save on the management fees. Appearances can be deceiving, however. First of all, you should consider the value of your time. For some, researching investments and making investment decisions is something of a hobby; for many of us, however, it is too time-consuming, and this is a powerful incentive to hire professional management. Also, for some strategies, the costs of doing it yourself can exceed those of hiring someone even after considering fees simply because of the higher commissions and other fees that individual investors frequently pay. For example, it might not be a bad idea for some of your investment to be in real estate, but a small investor will find it very difficult to directly acquire a sound real estate investment at reasonable cost.

An interesting question regarding professional management concerns the possibility of generating superior returns. It would seem logical to argue that by hiring a professional investor to manage your money, you would earn more, at least on average. Surely the pros make better investment decisions than the amateurs! Surprisingly, this isn't necessarily true. We will return to this subject in later chapters, but, for now, we simply note that the possibility of a superior return may not be a compelling reason to prefer professional management.

Market Timing A second basic investment decision you must make is whether you will try to buy and sell in anticipation of the future direction of the overall market. For example, you might move money into the stock market when you thought it was going to rise, and move money out when you thought it was going to fall. This activity is called **market timing**. Some investors very actively move money around to try to time short-term market movements; others are less active but still try to time longer-term movements. A fully passive strategy is one in which no attempt is made to time the market.

Market timing certainly seems like a reasonable thing to do; after all, why leave money in an investment if you expect it to decrease in value? You might be surprised that a common recommendation is that investors *not* try to time the market. As we discuss in more detail in a later chapter, the reason is that successful market timing is, to put it mildly, very difficult. To outperform a completely passive strategy, you must be able to very accurately predict the future; if you make even a small number of bad calls, you will likely never catch up.

Asset Allocation Another fundamental decision that must be made concerns the distribution of your investment across different types of assets. We saw in Chapter 1 that different asset types—small stocks, large stocks, bonds—have very different risk and return characteristics. In formulating your investment strategy, you must decide what percentage of your money will be placed in each of these broad categories. This decision is called **asset allocation**.

An important asset allocation decision for many investors is how much to invest in common stocks and how much to invest in bonds. There are some basic rules of thumb for this decision, one of the simplest being to split the portfolio into 60 percent stocks

Web Addresses

Websites are called out in the margins, along with a notation of how they relate to the chapter material.

Investor Constraints

Can you open a brokerage account with no money? See www.sharebuilder.com and www.buyandhold.com.

In addition to attitude toward risk, an investor's investment strategy will be affected by various constraints. We discuss five of the most common and important constraints next.

Resources Probably the most obvious constraint, and the one to which many students can most easily relate, is *resources*. Obviously, if you have no money, you cannot invest at all! Beyond that, certain types of investments and investment strategies either explicitly or effectively have minimum requirements. For example, a margin account must normally have a minimum of \$2,000 when it is established.

What is the minimum resource level needed? It depends on the investment strategy, and there is no precise answer. Through mutual funds, investments in the stock market can be made for as little as \$500 to start, with subsequent investments as small as \$100 or less. However, since there are frequently minimum commission levels, account fees, and other costs associated with buying and selling securities, an investor interested in actively trading on her own would probably need more like \$5,000 to \$50,000.

Horizon The investment *horizon* refers to the planned life of the investment. For example, individuals frequently save for retirement, where the investment horizon, depending on your age, can be very long. On the other hand, you might be saving to buy a house in the near future, implying a relatively short horizon.

Check This!

Every major section in each chapter ends with questions for review. This feature helps students test their understanding of the material before moving on to the next section.

Check This

1.1a

1.1b

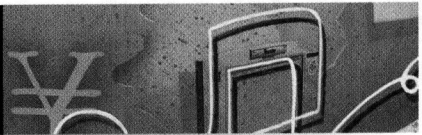
1.1c

Investment Updates

These boxed readings, reprinted from various business press sources, provide additional real-world events and examples to illustrate the material in the chapter. Some articles are from the past two years to highlight very recent events, and others present events of more historical significance.

INVESTMENT UPDATES

Popular 60-40 Mix Is No Panacea



Why do so many investors hold a mix of 60% stocks and 40% bonds?

As it turns out, there are three main arguments for the 60-40 mix. *But none of them clinch the case.*

It Produces Good Returns in Bad Times

The 1930s and 1940s were a nightmare for investors. In the 1930s, stocks were trounced by deflation. In the 1940s, bonds were battered by inflation. But in both decades, a mix of 60% U.S. stocks and 40% U.S. longer-term government bonds outpaced inflation by a healthy margin.

"What 60-40 has done is kept people whole over an extended period, especially a deflationary period," says Keith Ambachtsheer, a pension consultant in Toronto. "Where 60-40 runs into problems is in the 1970s," when inflation was much higher than in the 1940s. That high inflation not only wreaked havoc on bonds, but also hurt stocks, which were vulnerable because of rich valuations.

It Offers a Decent Mix of Income and Capital Gains

If you are retired and living off your portfolio, you might have been told to buy a 60-40 mix, because you get a moderate amount of income and your portfolio should keep growing along with inflation.

Right now, for instance, stocks yield less than 2%, but bonds kick off around 6%, giving a 60-40 portfolio an overall yield of some 3½%.

Meanwhile, for capital appreciation, you have to rely on your stocks. Over the long haul, these might climb at 7% a year, assuming share price-to-earnings multiples hold steady and earnings per share rise at their historic 7% annual clip. If you have 60% in stocks, that translates into overall portfolio growth of more than 4%, nicely ahead of today's 2% inflation rate.

But in truth, you could keep up with inflation—and generate a much higher yield—by putting far less into stocks and keeping even more in bonds. For retirees, it seems, there is nothing magical about the 60-40 mix.

It Generates the Best Risk-Adjusted Return

Derek Sasveld, a senior consultant with Chicago's Ibbotson Associates, says the theoretical justification for the 60-40 mix came in the mid-1960s. At that time, there was keen interest among some institutional investors in building portfolios that produced good risk-adjusted returns. To find the right mix, they looked at the past 40 years of U.S. stock and bond returns.


"That 60-40 portfolio from 1926 through 1965 was terrific," Mr. Sasveld notes. "The correlation between stocks and bonds at that point was virtually zero."

But times have changed. "Stocks and bonds are now more correlated," Mr. Sasveld says. "People shouldn't think about the 60-40 mix as being a good place to start."

Source: Jonathan Clements, "Not So Magical: Popular 60-40 Mix of Stocks and Bonds Is No Panacea," *The Wall Street Journal*, December 16, 1997.

Work the Web

Various actual screenshots are showcased throughout the text to illustrate how to access specific features of selected websites.



Work the Web

To look up information on common stocks using the Web, you need to know the "ticker" symbol for the ones you are interested in. You can look up ticker symbols in many places, including one of our favorite sites, finance.yahoo.com. Here we have looked up (using the "symbol lookup" link) and entered ticker symbols for some well-known "tech" stocks:

YAHOO! FINANCE

Home - Yahoo! - Help

dell csc0 intc msft

Get Quotes

Basic

symbol lookup

Once we hit "Get Quotes," this is what we get:

Monday, October 23 2000 12:11pm ET - U.S. Markets close in 3 hours and 49 minutes.

Symbol	Last Trade	Change	Volume	More Info
DELL	11:56AM 27 ¹¹ / ₁₆	⁻³ / ₄ -2.64%	12,125,900	Chart , News , Msgs , Profile , Research , Insider , Options
CSCO	11:56AM 56 ⁹ / ₁₆	⁻³ / ₄ -1.31%	21,097,400	Chart , News , Msgs , Profile , Research , Insider , Options
INTC	11:56AM 44 ⁹ / ₁₆	+1 ¹ / ₂ +3.48%	22,201,500	Chart , News , Msgs , Profile , Research , Insider , Options
MSFT	11:56AM 63 ¹³ / ₁₆	-1 ³ / ₈ -2.11%	33,838,800	Chart , News , Msgs , Profile , Research , Insider , Options

As you can see, we get the price for each stock, along with information about the change in price and volume (the number of shares traded). The prices here are quoted in fractions, which is the old way. Now, regular dollars and cents are used. There's a lot of links for you to hit to learn more, so have at it!

Spreadsheet Analysis

Self-contained spreadsheet examples show students how to set up spreadsheets to solve problems—a vital part of every business student's education.

Here is an Excel spreadsheet summarizing the formulas and analysis needed to calculate average returns and standard deviations using the 1990s as an example:

	A	B	C	D	E	F	G	H
1								
2	Using a spreadsheet to calculate average returns and standard deviations							
3								
4	Earlier in the chapter, our <i>Investment Updates</i> box suggested that the 1990s were one							
5	of the best decades for stock market investors. We will find out just how good by							
6	calculating the average returns and standard deviations for this period. Here are the							
7	year-by-year returns on the large company S&P 500 index:							
8								
9		Year	Return(%)	Year	Return(%)			
10		1990	-3.13	1995	37.80			
11		1991	30.53	1996	22.74			
12		1992	7.62	1997	33.43			
13		1993	10.07	1998	28.13			
14		1994	1.27	1999	21.03			
15								

Numbered Examples

Separate numbered and titled examples are integrated throughout the chapters. Each example illustrates an intuitive or mathematical application in a step-by-step format. There is enough detail in the explanations so the student doesn't have to look elsewhere for additional information.

Calculating Variances and Standard Deviations

Calculate return averages, variances, and standard deviations for S&P 500 large-cap stocks and Treasury bonds (T-bonds) using data for the first five years in Table 1.1, 1926–1930. First, calculate return averages as follows:

S&P 500 Large-Company Stocks	T-Bonds
13.70	6.40
35.80	4.51
45.14	0.18
-8.88	5.66
<u>-25.22</u>	<u>4.16</u>
60.54	20.91
Average return: $60.54 / 5 = 12.11$	$20.91 / 5 = 4.18$