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Essentials of Investments

12e

Bodie
Kane
Marcus

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Essentials *of* Investments

The McGraw Hill Education Series in Finance, Insurance, and Real Estate

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Essentials *of* Investments

Twelfth Edition

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ESSENTIALS OF INVESTMENTS

This book is printed on acid-free paper.

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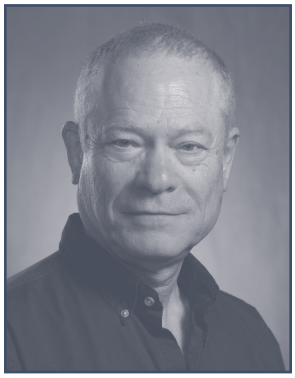

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Brief Contents

Contents

Organization of the Twelfth Edition

Essentials of Investments, Twelfth Edition, is intended as a textbook on investment analysis most applicable for a student's first course in investments. The chapters are written in a modular format to give instructors the flexibility to either omit certain chapters or rearrange their order. The highlights in the margins describe updates and important features in this edition.

This part lays out the general framework for the investment process in a nontechnical manner. We discuss the major players in the financial markets and provide an overview of security types and trading mechanisms. These chapters make it possible for instructors to assign term projects analyzing securities early in the course.

Includes sections on securitization, the roots of the financial crisis, and the fallout from the crisis.

Extensive coverage of the rise of electronic markets, algorithmic and high-speed trading, and changes in market structure.

Includes coverage of innovations in exchange-traded funds.

This part contains the core of modern portfolio theory. For courses emphasizing security analysis, this part may be skipped without loss of continuity.

All data are updated and available on the web through the Connect resources. The data are used to discuss risk management and tail risk.

Introduces simple in-chapter spreadsheets that can be used to compute investment opportunity sets and the index model.

Includes single-factor as well as multifactor models.

Considers evidence both supporting and refuting efficient markets.

Contains extensive treatment of behavioral finance and provides an introduction to technical analysis.

Part THREE

DEBT SECURITIES 283

Part FOUR

SECURITY ANALYSIS 363

Part FIVE

DERIVATIVE MARKETS 475

Part SIX

ACTIVE INVESTMENT MANAGEMENT 581

This is the first of three parts on security valuation.

Includes material on sovereign credit default swaps.

Contains spreadsheet material on duration and convexity.

This part is presented in a "top-down" manner, starting with the broad macroeconomic environment before moving to more specific analysis.

Discusses how international political developments such as the sovereign debt crisis can have major impacts on economic prospects.

Contains free cash flow equity valuation models as well as a discussion of the pitfalls of discounted cash flow models.

Includes a top-down rationale for how ratio analysis can be organized to guide one's analysis of firm performance.

This part highlights how these markets have become crucial and integral to the financial universe and are major sources of innovation.

Offers thorough introduction to option payoffs, strategies, and securities with embedded options.

Includes an introduction to risk-neutral valuation methods and their implementation in the binomial option-pricing model.

This part unifies material on active management and is ideal for a closing-semester unit on applying theory to actual portfolio management.

Rigorous development of performance evaluation methods.

Provides evidence on political risk as well as the benefits of international diversification.

Updated assessment of hedge fund performance and the exposure of hedge funds to "black swans."

Employs extensive spreadsheet analysis of the interaction of taxes and inflation on long-term financial strategies.

Modeled after the CFA Institute curriculum, also includes guidelines on "How to Become a Chartered Financial Analyst."

Pedagogical Features

Learning Objectives

Each chapter begins with a summary of the chapter learning objectives, providing students with an overview of the concepts they should understand after reading the chapter. The end-of-chapter problems and CFA questions are tagged with the corresponding learning objective.

Learning Objectives

- **LO 8-1** Demonstrate why security price changes should be essentially unpredictable in an efficient market.
- **LO 8-2** Cite evidence that supports and contradicts the efficient market hypothesis.
- **LO 8-3** Provide interpretations of various stock market "anomalies."
- **LO 8-4** Formulate investment strategies that make sense in informationally efficient markets.

Chapter Overview

Each chapter begins with a brief narrative to explain the concepts that will be covered in more depth. Relevant websites related to chapter material can be found in Connect. These sites make it easy for students to research topics further and retrieve financial data and information.

This chapter will provide you with a broad introduction to the many venues and procedures available for trading securities. We will see that trading mechanisms range from direct negotiation among market participants to fully automated computer crossing of trade orders.

The first time a security trades is when it is issued to the public. Therefore, we begin with a look at how securities are first marketed to the public by investment bankers, the midwives of securities. We turn next to a broad survey of how already-issued securities may be traded among investors, focusing on the differences between dealer markets, electronic markets, and formal stock exchanges. With this background, we then turn to specific trading arenas such as the New York Stock Exchange, NASDAQ, and several all-electronic markets. We compare the mechanics of trade execution and the impact of cross-market integration of trading.

We then turn to the essentials of some specific types of transactions, such as buying on margin and short-selling stocks. We close the chapter with a look at some important aspects of the regulations governing security trading, including insider trading laws, circuit breakers, and the role of security markets as self-regulating organizations.

Key Terms in the Margin

Key terms are indicated in color and defined in the margin the first time the term is used. A full list of key terms is included in the end-of-chapter materials.

index model
Model that relates stock returns to returns on both a broad market index and firm-specific factors.

6.5 A SINGLE-INDEX STOCK MARKET

We started this chapter with the distinction between systematic and firm-specific risk. Systematic risk is macroeconomic, affecting all securities, while firm-specific risk factors affect only one particular firm or, at most, a cluster of firms. **Index models** are statistical models designed to estimate these two components of risk for a particular security or portfolio.

Numbered Equations

Key equations are called out in the text and identified by equation numbers. These key formulas are listed at the end of each chapter. Equations that are frequently used are also featured on the text's end sheets for convenient reference.

be necessary to provide an after-tax return equal to that of municipals. To derive this value, we set after-tax yields equal and solve for the *equivalent taxable yield* of the tax-exempt bond. This is the rate a taxable bond would need to offer in order to match the after-tax yield on the tax-free municipal.

$$r_{\text{taxable}}(1-t) = r_{\text{muni}} \tag{2.1}$$

or

$$r_{\text{taxable}} = \frac{r_{\text{muni}}}{1-t} \tag{2.2}$$

Thus, the equivalent taxable yield is simply the tax-free rate divided by $1 - t$. Table 2.2 presents equivalent taxable yields for several municipal yields and tax rates.

On the MARKET FRONT

THE LIBOR SCANDALS

LIBOR was designed initially as a survey of interbank lending rates but soon became a key determinant of short-term interest rates with far-reaching significance. More than $500 trillion of derivative contracts have payoffs tied to it, and many trillion dollars of loans and bonds with floating interest rates linked to LIBOR are currently outstanding. LIBOR is quoted for loans in five currencies (the U.S. dollar, yen, euro, U.K. pound, and Swiss franc) for maturities ranging from a day to a year, although three months is the most common.

However, LIBOR is not a rate at which actual transactions occur; instead, it is just a survey of "estimated" borrowing rates, and this has made it vulnerable to manipulation. Several large banks are asked to report the rate at which they *claim* they can borrow in the interbank market. Outliers are trimmed from the sample of responses, and LIBOR is calculated as the average of the mid-range estimates.

Over time, several problems surfaced. First, it appeared that many banks understated the rates at which they claimed they could borrow in an effort to make themselves look financially stronger. Other surveys that asked for estimates of the rates at which *other* banks could borrow resulted in higher values. Moreover, LIBOR did not seem to reflect current market conditions. A majority of LIBOR submissions were unchanged from day to day even when other interest rates fluctuated, and LIBOR spreads showed surprisingly low correlation with other measures of credit risk.

Even worse, once the market came under scrutiny, it emerged that participating banks were colluding to manipulate their LIBOR cartel essentially set up a "favor bank" to help each other move the survey average up or down depending on their trading positions.

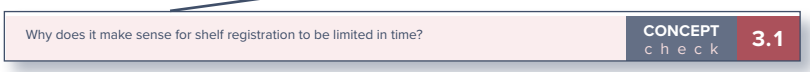
To date, more than $6 billion of fines have been paid, among them, Deutsche Bank ($2.5 billion), UBS ($1.5 billion), Royal Bank of Scotland ($1.1 billion), Rabobank ($1 billion), and SocGen ($600 million). But government fines may be only the beginning. A federal appeals court in 2016 ruled that private lawsuits involving antitrust violations may proceed. Borrowers paying an interest rate tied to LIBOR argue that they were harmed by the collusion of participating banks to coordinate rates.

Several reforms have been suggested, and some have been implemented. The British Bankers Association, which until recently ran the LIBOR survey, yielded responsibility for LIBOR to British regulators. LIBOR quotes in less-active currencies and maturities, where collusion is easier, have been eliminated. More substantive proposals would replace the survey rates with ones based on actual, verifiable transactions—that is, real loans. British regulators have expressed their wish to phase out LIBOR by 2021. Two primary contenders to replace it are SONIA (Sterling Overnight Interbank Average Rate), an overnight interest rate in the U.K. market, and, for U.S. dollar rates, SOFR (secured overnight financing rate), the rate on repurchase agreements on Treasury securities.

These proposals leave some important questions unanswered. When LIBOR is phased out, what will happen to LIBOR-based long-term contracts with maturities that extend beyond 2021? For example, LIBOR is the most common index for adjustable

On the Market Front Boxes

Current articles from financial publications such as *The Wall Street Journal* are featured as boxed readings. Each box is referred to within the narrative of the text, and its real-world relevance to the chapter material is clearly defined.

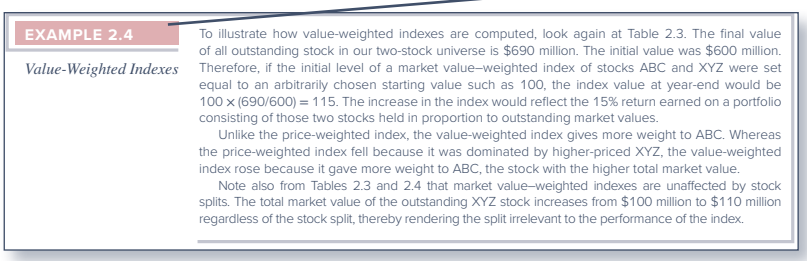


Why does it make sense for shelf registration to be limited in time?

CONCEPT check 3.1

Concept Checks

These self-test questions in the body of the chapter enable students to determine whether the preceding material has been understood and then reinforce understanding before students read further. Detailed Solutions to the Concept Checks are found at the end of each chapter.



EXAMPLE 2.4

Value-Weighted Indexes

To illustrate how value-weighted indexes are computed, look again at Table 2.3. The final value of all outstanding stock in our two-stock universe is $690 million. The initial value was $600 million. Therefore, if the initial level of a market value–weighted index of stocks ABC and XYZ were set equal to an arbitrarily chosen starting value such as 100, the index value at year-end would be 100 × (690/600) = 115. The increase in the index would reflect the 15% return earned on a portfolio consisting of those two stocks held in proportion to outstanding market values.

Unlike the price-weighted index, the value-weighted index gives more weight to ABC. Whereas the price-weighted index fell because it was dominated by higher-priced XYZ, the value-weighted index rose because it gave more weight to ABC, the stock with the higher total market value.

Note also from Tables 2.3 and 2.4 that market value–weighted indexes are unaffected by stock splits. The total market value of the outstanding XYZ stock increases from $100 million to $110 million regardless of the stock split, thereby rendering the split irrelevant to the performance of the index.

Numbered Examples

Numbered and titled examples are integrated in each chapter. Using the worked-out solutions to these examples as models, students can learn how to solve specific problems step-by-step as well as gain insight into general principles by seeing how they are applied to answer concrete questions.

Excel Integration

Excel Applications

Because many courses now require students to perform analyses in spreadsheet format, Excel has been integrated throughout the book. It is used in examples as well as in this chapter feature, which shows students how to create and manipulate spreadsheets to solve specific problems. This feature starts with an example presented in the chapter, briefly discusses how a spreadsheet can be valuable for investigating the topic, shows a sample spreadsheet, and asks students to apply the data to answer questions. These applications also direct the student to the web to work with an interactive version of the spreadsheet. The spreadsheet files are available for download in Connect; available spreadsheets are denoted by an icon. As extra guidance, the spreadsheets include a comment feature that documents both inputs and outputs. Solutions for these exercises are located on the password-protected instructor site only, so instructors can assign these exercises either for homework or just for practice.

Excel application spreadsheets are available for the following:

Chapter 3: Buying on Margin; Short Sales
Chapter 6: Estimating the Index Model
Chapter 11: Immunization; Convexity
Chapter 15: Options, Stock, and Lending; Straddles and Spreads
Chapter 17: Spot-Futures Parity
Chapter 18: Performance Measurement; Performance Attribution
Chapter 19: International Diversification

Spreadsheet exhibit templates are also available for the following:

Chapter 5: Spreadsheet 5.1
Chapter 6: Spreadsheets 6.1–6.6
Chapter 10: Spreadsheets 10.1 & 10.2
Chapter 11: Spreadsheets 11.1 & 11.2
Chapter 13: Spreadsheets 13.1 & 13.2
Chapter 16: Spreadsheet 16.1
Chapter 21: Spreadsheets 21.1–21.10

EXCEL APPLICATIONS

Buying on Margin

This spreadsheet is available in Connect

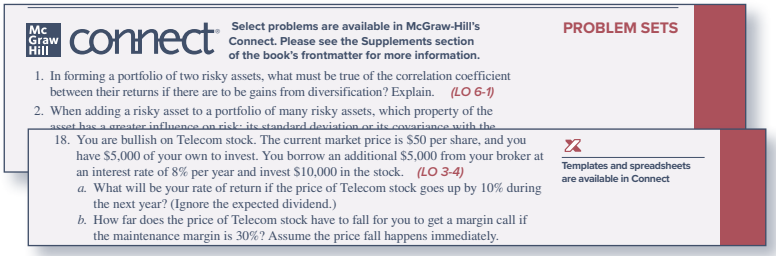
The Excel spreadsheet model below makes it easy to analyze the impacts of different margin levels and the volatility of stock prices. It also allows you to compare return on investment for a margin trade with a trade using no borrowed funds.

	A	B	C	D	E	F	G	H
1								
2			Action or Formula	Ending	Return on		Ending	Return with
3			for Column B	St Price	Investment		St Price	No Margin
4	Initial Equity Investment	$10,000.00	Enter data		−42.00%			−19.00%
5	Amount Borrowed	$10,000.00	(B4/B10)−B4	$20.00	−122.00%		$20.00	−59.00%
6	Initial Stock Price	$50.00	Enter data	25.00	−102.00%		25.00	−49.00%
7	Shares Purchased	400	(B4/B10)/B6	30.00	−82.00%		30.00	−39.00%
8	Ending Stock Price	$40.00	Enter data	35.00	−62.00%		35.00	−29.00%
9	Cash Dividends During Hold Per.	$0.50	Enter data	40.00	−42.00%		40.00	−19.00%
10	Initial Margin Percentage	50.00%	Enter data	45.00	−22.00%		45.00	−9.00%
11	Maintenance Margin Percentage	30.00%	Enter data	50.00	−2.00%		50.00	1.00%
12				55.00	18.00%		55.00	11.00%
13	Rate on Margin Loan	8.00%	Enter data	60.00	38.00%		60.00	21.00%
14	Holding Period in Months	6	Enter data	65.00	58.00%		65.00	31.00%
15				70.00	78.00%		70.00	41.00%
16	**Return on Investment**			75.00	98.00%		75.00	51.00%
17	Capital Gain on Stock	−$4,000.00	B7*(B8−B6)	80.00	118.00%		80.00	61.00%
18	Dividends	$200.00	B7*B9					
19	Interest on Margin Loan	$400.00	B5*(B14/12)*B13					
20	Net Income	−$4,200.00	B17+B18−B19			LEGEND:		
21	Initial Investment	$10,000.00	B4			Enter data		
22	Return on Investment	−42.00%	B20/B21			Value calculated		

Excel Questions

1. Suppose you buy 100 shares of stock initially selling for $50, borrowing 25% of the necessary funds from your broker; that is, the initial margin on your purchase is 25%. You pay an interest rate of 8% on margin loans.
   a. How much of your own money do you invest? How much do you borrow from your broker?
   b. What will be your rate of return for the following stock prices at the end of a one-year holding period? (i) $40; (ii) $50; (iii) $60.

End-of-Chapter Features

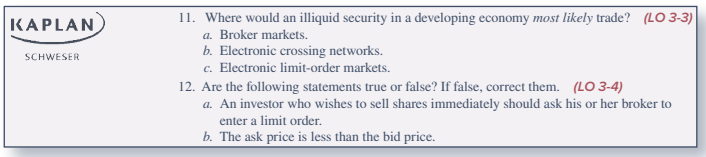


Problem Sets

We strongly believe that practice in solving problems is a critical part of learning investments, so we provide a good variety. We have arranged questions by level of difficulty.

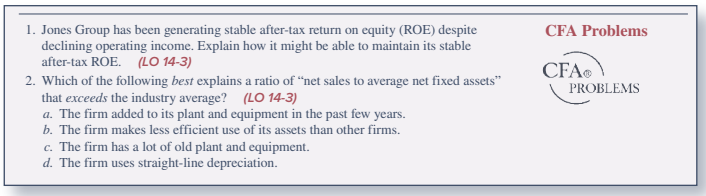
Excel Problems

Select end-of-chapter questions require the use of Excel. These problems are denoted with an icon. Templates and spreadsheets are available in Connect.



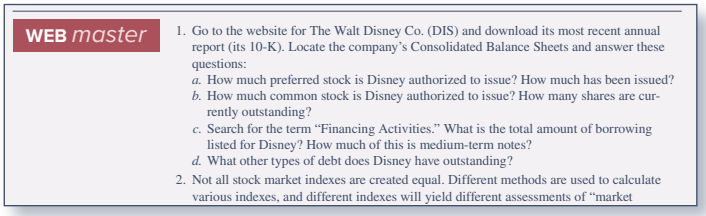
Kaplan-Schweser Problems

Each chapter contains select CFA-style questions derived from the Kaplan-Schweser CFA preparation courses. These questions are tagged with an icon for easy reference.



CFA Problems

We provide several questions from past CFA exams in applicable chapters. These questions represent the kinds of questions that professionals in the field believe are relevant to the practicing money manager. Appendix B, at the back of the book, lists each CFA question and the level and year of the CFA Exam it was included in, for easy reference when studying for the exam.



Web Master Exercises

These exercises are a great way to allow students to test their skills on the Internet. Each exercise consists of an activity related to practical problems and real-world scenarios.

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Instructor Library

The Connect Instructor Library is your repository for additional resources to improve student engagement in and out of class. You can select and use any asset that enhances your lecture.

This library contains information about the book and the authors, as well as all of the instructor supplements for this text, including:

- **Instructor's Manual** Revised by Nicholas Racculia, St. Vincent College, this instructional tool provides an integrated learning approach revised for this edition. Each chapter includes a Chapter Overview, Learning Objectives, and Presentation of Material that outlines and organizes the material around the PowerPoint Presentation.
- **Solutions Manual** The Solutions Manual, carefully revised by the authors with assistance from Nicholas Racculia, contains solutions to all basic, intermediate, and challenge problems found at the end of each chapter.
- **Test Bank** Prepared by Nicholas Racculia, the Test Bank contains more than 1,200 questions and includes over 220 new questions. Each question is ranked by level of difficulty (easy, medium, hard) and tagged with the learning objective, the topic, AACSB, and Bloom's Taxonomy, which allows greater flexibility in creating a test. The Test Bank is assignable within Connect.
- **PowerPoint Presentations** These presentation slides, developed by Leslie Rush from the University of Hawaii, contain figures and tables from the text, key points, and summaries in a visually stimulating collection of slides. These slides follow the order of the chapters, but if you have PowerPoint software, you may customize the program to fit your lecture.

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>
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Top: Jenner Images/Getty Images, Left: Hero Images/Getty Images, Right: Hero Images/Getty Images

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