

# Investments

ELEVENTH EDITION

**ZVI BODIE**

Boston University

**ALEX KANE**

University of California, San Diego

**ALAN J. MARCUS**

Boston College

**Mc  
Graw  
Hill**  
Education

# Brief Contents

Preface xvi

## PART I

### Introduction 1

1

The Investment Environment 1

2

Asset Classes and Financial Instruments 27

3

How Securities Are Traded 57

4

Mutual Funds and Other Investment  
Companies 91

## PART II

### Portfolio Theory and Practice 117

5

Risk, Return, and the Historical Record 117

6

Capital Allocation to Risky Assets 157

7

Optimal Risky Portfolios 193

8

Index Models 245

## PART III

### Equilibrium in Capital Markets 277

9

The Capital Asset Pricing Model 277

10

Arbitrage Pricing Theory and Multifactor  
Models of Risk and Return 309

11

The Efficient Market Hypothesis 333

12

Behavioral Finance and Technical  
Analysis 373

13

Empirical Evidence on Security Returns 397

## PART IV

### Fixed-Income Securities 425

14

Bond Prices and Yields 425

15

The Term Structure of Interest Rates 467

16

Managing Bond Portfolios 495

**PART V**

**Security Analysis 537**

17

Macroeconomic and Industry Analysis 537

18

Equity Valuation Models 569

19

Financial Statement Analysis 613

**PART VI**

**Options, Futures, and Other  
Derivatives 657**

20

Options Markets: Introduction 657

21

Option Valuation 699

22

Futures Markets 747

23

Futures, Swaps, and Risk Management 775

**PART VII**

**Applied Portfolio  
Management 811**

24

Portfolio Performance Evaluation 811

25

International Diversification 853

26

Hedge Funds 881

27

The Theory of Active Portfolio  
Management 907

28

Investment Policy and the Framework of the  
CFA Institute 931

**REFERENCES TO CFA PROBLEMS 967**

**GLOSSARY G-1**

**NAME INDEX I-1**

**SUBJECT INDEX I-4**

**FORMULAS F-1**

# Contents

Preface xvi

## PART I

### Introduction 1

#### Chapter 1

#### The Investment Environment 1

- 1.1 Real Assets versus Financial Assets 2
  - 1.2 Financial Assets 3
  - 1.3 Financial Markets and the Economy 5
    - The Informational Role of Financial Markets / Consumption Timing / Allocation of Risk / Separation of Ownership and Management / Corporate Governance and Corporate Ethics*
  - 1.4 The Investment Process 8
  - 1.5 Markets Are Competitive 9
    - The Risk–Return Trade-Off / Efficient Markets*
  - 1.6 The Players 11
    - Financial Intermediaries / Investment Bankers / Venture Capital and Private Equity*
  - 1.7 The Financial Crisis of 2008 15
    - Antecedents of the Crisis / Changes in Housing Finance / Mortgage Derivatives / Credit Default Swaps / The Rise of Systemic Risk / The Shoe Drops / The Dodd-Frank Reform Act*
  - 1.8 Outline of the Text 23
- End of Chapter Material 23–26

#### Chapter 2

#### Asset Classes and Financial Instruments 27

- 2.1 The Money Market 27
  - Treasury Bills / Certificates of Deposit / Commercial Paper / Bankers' Acceptances / Eurodollars / Repos*

*and Reverses / Federal Funds / Brokers' Calls / The LIBOR Market / Yields on Money Market Instruments*

#### 2.2 The Bond Market 33

*Treasury Notes and Bonds / Inflation-Protected Treasury Bonds / Federal Agency Debt / International Bonds / Municipal Bonds / Corporate Bonds / Mortgages and Mortgage-Backed Securities*

#### 2.3 Equity Securities 40

*Common Stock as Ownership Shares / Characteristics of Common Stock / Stock Market Listings / Preferred Stock / Depositary Receipts*

#### 2.4 Stock and Bond Market Indexes 43

*Stock Market Indexes / Dow Jones Industrial Average / The Standard & Poor's 500 Index / Other U.S. Market-Value Indexes / Equally Weighted Indexes / Foreign and International Stock Market Indexes / Bond Market Indicators*

#### 2.5 Derivative Markets 50

*Options / Futures Contracts*

End of Chapter Material 52–56

#### Chapter 3

#### How Securities Are Traded 57

- 3.1 How Firms Issue Securities 57
  - Privately Held Firms / Publicly Traded Companies / Shelf Registration / Initial Public Offerings*
- 3.2 How Securities Are Traded 62
  - Types of Markets*
    - Direct Search Markets / Brokered Markets / Dealer Markets / Auction Markets*
  - Types of Orders*
    - Market Orders / Price-Contingent Orders*

*Trading Mechanisms**Dealer Markets / Electronic Communication Networks (ECNs) / Specialist Markets*

- 3.3 The Rise of Electronic Trading 66**
- 3.4 U.S. Markets 68**  
*NASDAQ / The New York Stock Exchange / ECNs*
- 3.5 New Trading Strategies 70**  
*Algorithmic Trading / High-Frequency Trading / Dark Pools / Bond Trading*
- 3.6 Globalization of Stock Markets 73**
- 3.7 Trading Costs 74**
- 3.8 Buying on Margin 75**
- 3.9 Short Sales 78**
- 3.10 Regulation of Securities Markets 82**  
*Self-Regulation / The Sarbanes-Oxley Act / Insider Trading*
- End of Chapter Material 86–90**

## Chapter 4

**Mutual Funds and Other Investment Companies 91**

- 4.1 Investment Companies 91**
- 4.2 Types of Investment Companies 92**  
*Unit Investment Trusts / Managed Investment Companies / Other Investment Organizations*  
*Commingled Funds / Real Estate Investment Trusts (REITs) / Hedge Funds*
- 4.3 Mutual Funds 95**  
*Investment Policies*  
*Money Market Funds / Equity Funds / Sector Funds / Bond Funds / International Funds / Balanced Funds / Asset Allocation and Flexible Funds / Index Funds*  
*How Funds Are Sold*
- 4.4 Costs of Investing in Mutual Funds 98**  
*Fee Structure*  
*Operating Expenses / Front-End Load / Back-End Load / 12b-1 Charges*  
*Fees and Mutual Fund Returns*
- 4.5 Taxation of Mutual Fund Income 102**
- 4.6 Exchange-Traded Funds 103**
- 4.7 Mutual Fund Investment Performance: A First Look 106**
- 4.8 Information on Mutual Funds 109**
- End of Chapter Material 112–116**

## PART II

**Portfolio Theory and Practice 117**

## Chapter 5

**Risk, Return, and the Historical Record 117**

- 5.1 Determinants of the Level of Interest Rates 118**  
*Real and Nominal Rates of Interest / The Equilibrium Real Rate of Interest / The Equilibrium Nominal Rate of Interest / Taxes and the Real Rate of Interest*
- 5.2 Comparing Rates of Return for Different Holding Periods 121**  
*Annual Percentage Rates / Continuous Compounding*
- 5.3 Bills and Inflation, 1926–2015 124**
- 5.4 Risk and Risk Premiums 126**  
*Holding-Period Returns / Expected Return and Standard Deviation / Excess Returns and Risk Premiums*
- 5.5 Time Series Analysis of Past Rates of Return 129**  
*Time Series versus Scenario Analysis / Expected Returns and the Arithmetic Average / The Geometric (Time-Weighted) Average Return / Variance and Standard Deviation / Mean and Standard Deviation Estimates from Higher-Frequency Observations / The Reward-to-Volatility (Sharpe) Ratio*
- 5.6 The Normal Distribution 134**
- 5.7 Deviations from Normality and Alternative Risk Measures 136**  
*Value at Risk / Expected Shortfall / Lower Partial Standard Deviation and the Sortino Ratio / Relative Frequency of Large, Negative 3-Sigma Returns*
- 5.8 Historic Returns on Risky Portfolios 140**  
*A Global View of the Historical Record*
- 5.9 Normality and Long-Term Investments 147**  
*Short-Run versus Long-Run Risk / Forecasts for the Long Haul*
- End of Chapter Material 151–156**

## Chapter 6

**Capital Allocation to Risky Assets 157**

- 6.1 Risk and Risk Aversion 158**  
*Risk, Speculation, and Gambling / Risk Aversion and Utility Values / Estimating Risk Aversion*
- 6.2 Capital Allocation across Risky and Risk-Free Portfolios 164**
- 6.3 The Risk-Free Asset 166**

- 6.4 **Portfolios of One Risky Asset and a Risk-Free Asset** 167
- 6.5 **Risk Tolerance and Asset Allocation** 170  
*Non-Normal Returns*
- 6.6 **Passive Strategies: The Capital Market Line** 176  
**End of Chapter Material** 178–187  
**Appendix A: Risk Aversion, Expected Utility, and the St. Petersburg Paradox** 187  
**Appendix B: Utility Functions and Risk Premiums** 191

Chapter 7

**Optimal Risky Portfolios** 193

- 7.1 **Diversification and Portfolio Risk** 194
- 7.2 **Portfolios of Two Risky Assets** 195
- 7.3 **Asset Allocation with Stocks, Bonds, and Bills** 203  
*Asset Allocation with Two Risky Asset Classes*
- 7.4 **The Markowitz Portfolio Optimization Model** 208  
*Security Selection / Capital Allocation and the Separation Property / The Power of Diversification / Asset Allocation and Security Selection / Optimal Portfolios and Non-Normal Returns*
- 7.5 **Risk Pooling, Risk Sharing, and the Risk of Long-Term Investments** 217  
*Risk Pooling and the Insurance Principle / Risk Sharing / Diversification and the Sharpe Ratio / Time Diversification and the Investment Horizon*  
**End of Chapter Material** 222–232  
**Appendix A: A Spreadsheet Model for Efficient Diversification** 232  
**Appendix B: Review of Portfolio Statistics** 237

Chapter 8

**Index Models** 245

- 8.1 **A Single-Factor Security Market** 246  
*The Input List of the Markowitz Model / Systematic versus Firm-Specific Risk*
- 8.2 **The Single-Index Model** 248  
*The Regression Equation of the Single-Index Model / The Expected Return–Beta Relationship / Risk and Covariance in the Single-Index Model / The Set of Estimates Needed for the Single-Index Model / The Index Model and Diversification*
- 8.3 **Estimating the Single-Index Model** 255  
*The Security Characteristic Line for Ford / The Explanatory Power of Ford’s SCL / The Estimate of Alpha / The Estimate of Beta / Firm-Specific Risk*  
*Typical Results from Index Model Regressions*

- 8.4 **The Industry Version of the Index Model** 259  
*Predicting Betas*
- 8.5 **Portfolio Construction Using the Single-Index Model** 262  
*Alpha and Security Analysis / The Index Portfolio as an Investment Asset / The Single-Index Model Input List / The Optimal Risky Portfolio in the Single-Index Model / The Information Ratio / Summary of Optimization Procedure / An Example / Correlation and Covariance Matrix*  
*Risk Premium Forecasts / The Optimal Risky Portfolio / Is the Index Model Inferior to the Full-Covariance Model?*  
**End of Chapter Material** 271–276

PART III

**Equilibrium in Capital Markets** 277

Chapter 9

**The Capital Asset Pricing Model** 277

- 9.1 **The Capital Asset Pricing Model** 277  
*Why Do All Investors Hold the Market Portfolio? / The Passive Strategy Is Efficient / The Risk Premium of the Market Portfolio / Expected Returns on Individual Securities / The Security Market Line / The CAPM and the Single-Index Market*
- 9.2 **Assumptions and Extensions of the CAPM** 288  
*Identical Input Lists / Risk-Free Borrowing and the Zero-Beta Model / Labor Income and Nontraded Assets / A Multiperiod Model and Hedge Portfolios / A Consumption-Based CAPM / Liquidity and the CAPM*
- 9.3 **The CAPM and the Academic World** 298
- 9.4 **The CAPM and the Investment Industry** 299  
**End of Chapter Material** 300–308

Chapter 10

**Arbitrage Pricing Theory and Multifactor Models of Risk and Return** 309

- 10.1 **Multifactor Models: A Preview** 310  
*Factor Models of Security Returns*
- 10.2 **Arbitrage Pricing Theory** 312  
*Arbitrage, Risk Arbitrage, and Equilibrium / Well-Diversified Portfolios / The Security Market Line of the APT*  
*Individual Assets and the APT*  
*Well-Diversified Portfolios in Practice*
- 10.3 **The APT, the CAPM, and the Index Model** 319  
*The APT and the CAPM / The APT and Portfolio Optimization in a Single-Index Market*

- 10.4 **A Multifactor APT** 321
- 10.5 **The Fama-French (FF) Three-Factor Model** 324
- End of Chapter Material** 326–332

Chapter 11

**The Efficient Market Hypothesis** 333

- 11.1 **Random Walks and the Efficient Market Hypothesis** 334  
*Competition as the Source of Efficiency / Versions of the Efficient Market Hypothesis*
- 11.2 **Implications of the EMH** 339  
*Technical Analysis / Fundamental Analysis / Active versus Passive Portfolio Management / The Role of Portfolio Management in an Efficient Market / Resource Allocation*
- 11.3 **Event Studies** 343
- 11.4 **Are Markets Efficient?** 347  
*The Issues*  
*The Magnitude Issue / The Selection Bias Issue / The Lucky Event Issue*  
*Weak-Form Tests: Patterns in Stock Returns*  
*Returns over Short Horizons / Returns over Long Horizons*  
*Predictors of Broad Market Returns / Semistrong Tests: Market Anomalies*  
*The Small-Firm Effect / The Neglected-Firm Effect and Liquidity Effects / Book-to-Market Ratios / Post-Earnings-Announcement Price Drift*  
*Strong-Form Tests: Inside Information / Interpreting the Anomalies*  
*Risk Premiums or Inefficiencies? / Anomalies or Data Mining? / Anomalies over Time*  
*Bubbles and Market Efficiency*
- 11.5 **Mutual Fund and Analyst Performance** 359  
*Stock Market Analysts / Mutual Fund Managers / So, Are Markets Efficient?*
- End of Chapter Material** 365–372

Chapter 12

**Behavioral Finance and Technical Analysis** 373

- 12.1 **The Behavioral Critique** 374  
*Information Processing*  
*Forecasting Errors / Overconfidence / Conservatism / Sample Size Neglect and Representativeness*  
*Behavioral Biases*  
*Framing / Mental Accounting / Regret Avoidance / Affect / Prospect Theory*  
*Limits to Arbitrage*  
*Fundamental Risk / Implementation Costs / Model Risk*

*Limits to Arbitrage and the Law of One Price*  
*“Siamese Twin” Companies / Equity Carve-Outs / Closed-End Funds*  
*Bubbles and Behavioral Economics / Evaluating the Behavioral Critique*

- 12.2 **Technical Analysis and Behavioral Finance** 384  
*Trends and Corrections*  
*Momentum and Moving Averages / Relative Strength / Breadth*  
*Sentiment Indicators*  
*Trin Statistic / Confidence Index / Put/Call Ratio*  
*A Warning*
- End of Chapter Material** 391–396

Chapter 13

**Empirical Evidence on Security Returns** 397

- 13.1 **The Index Model and the Single-Factor SML** 398  
*The Expected Return–Beta Relationship*  
*Setting Up the Sample Data / Estimating the SCL / Estimating the SML*  
*Tests of the CAPM / The Market Index / Measurement Error in Beta*
- 13.2 **Tests of the Multifactor Models** 403  
*Labor Income / Private (Nontraded) Business / Early Tests of the Multifactor CAPM and APT / A Macro Factor Model*
- 13.3 **Fama-French-Type Factor Models** 407  
*Size and B/M as Risk Factors / Behavioral Explanations / Momentum: A Fourth Factor*
- 13.4 **Liquidity and Asset Pricing** 414
- 13.5 **Consumption-Based Asset Pricing and the Equity Premium Puzzle** 416  
*Expected versus Realized Returns / Survivorship Bias / Extensions to the CAPM May Resolve the Equity Premium Puzzle / Liquidity and the Equity Premium Puzzle / Behavioral Explanations of the Equity Premium Puzzle*
- End of Chapter Material** 422–424

PART IV

**Fixed-Income Securities** 425

Chapter 14

**Bond Prices and Yields** 425

- 14.1 **Bond Characteristics** 426  
*Treasury Bonds and Notes*  
*Accrued Interest and Quoted Bond Prices*

*Corporate Bonds*

*Call Provisions on Corporate Bonds / Convertible Bonds / Puttable Bonds / Floating-Rate Bonds*  
*Preferred Stock / Other Domestic Issuers / International Bonds / Innovation in the Bond Market*  
*Inverse Floaters / Asset-Backed Bonds / Catastrophe Bonds / Indexed Bonds*

**14.2 Bond Pricing 432**

*Bond Pricing between Coupon Dates*

**14.3 Bond Yields 438**

*Yield to Maturity / Yield to Call / Realized Compound Return versus Yield to Maturity*

**14.4 Bond Prices over Time 444**

*Yield to Maturity versus Holding-Period Return / Zero-Coupon Bonds and Treasury Strips / After-Tax Returns*

**14.5 Default Risk and Bond Pricing 449**

*Junk Bonds / Determinants of Bond Safety / Bond Indentures*

*Sinking Funds / Subordination of Further Debt / Dividend Restrictions / Collateral*

*Yield to Maturity and Default Risk / Credit Default Swaps / Credit Risk and Collateralized Debt Obligations*

**End of Chapter Material 460–466**

Chapter 15

**The Term Structure of Interest Rates 467**

**15.1 The Yield Curve 467**

*Bond Pricing*

**15.2 The Yield Curve and Future Interest Rates 470**

*The Yield Curve under Certainty / Holding-Period Returns / Forward Rates*

**15.3 Interest Rate Uncertainty and Forward Rates 475**

**15.4 Theories of the Term Structure 477**

*The Expectations Hypothesis / Liquidity Preference Theory*

**15.5 Interpreting the Term Structure 480**

**15.6 Forward Rates as Forward Contracts 484**

**End of Chapter Material 486–494**

Chapter 16

**Managing Bond Portfolios 495**

**16.1 Interest Rate Risk 496**

*Interest Rate Sensitivity / Duration / What Determines Duration?*

*Rule 1 for Duration / Rule 2 for Duration / Rule 3 for Duration / Rule 4 for Duration / Rule 5 for Duration*

**16.2 Convexity 505**

*Why Do Investors Like Convexity? / Duration and Convexity of Callable Bonds / Duration and Convexity of Mortgage-Backed Securities*

**16.3 Passive Bond Management 513**

*Bond-Index Funds / Immunization / Cash Flow Matching and Dedication / Other Problems with Conventional Immunization*

**16.4 Active Bond Management 522**

*Sources of Potential Profit / Horizon Analysis*

**End of Chapter Material 525–536**

PART V

**Security Analysis 537**

Chapter 17

**Macroeconomic and Industry Analysis 537**

**17.1 The Global Economy 537**

**17.2 The Domestic Macroeconomy 540**

*Key Economic Indicators*

*Gross Domestic Product / Employment / Inflation / Interest Rates / Budget Deficit / Sentiment*

**17.3 Demand and Supply Shocks 542**

**17.4 Federal Government Policy 542**

*Fiscal Policy / Monetary Policy / Supply-Side Policies*

**17.5 Business Cycles 545**

*The Business Cycle / Economic Indicators / Other Indicators*

**17.6 Industry Analysis 550**

*Defining an Industry / Sensitivity to the Business Cycle / Sector Rotation / Industry Life Cycles*

*Start-Up Stage / Consolidation Stage / Maturity Stage / Relative Decline*

*Industry Structure and Performance*

*Threat of Entry / Rivalry between Existing Competitors / Pressure from Substitute Products / Bargaining Power of Buyers / Bargaining Power of Suppliers*

**End of Chapter Material 560–568**

Chapter 18

**Equity Valuation Models 569**

**18.1 Valuation by Comparables 569**

*Limitations of Book Value*

**18.2 Intrinsic Value versus Market Price 571**

**18.3 Dividend Discount Models 573**

*The Constant-Growth DDM / Convergence of Price to Intrinsic Value / Stock Prices and Investment*



*Opportunities / Life Cycles and Multistage Growth Models / Multistage Growth Models*

- 18.4 The Price–Earnings Ratio 587**  
*The Price–Earnings Ratio and Growth Opportunities / P/E Ratios and Stock Risk / Pitfalls in P/E Analysis / Combining P/E Analysis and the DDM / Other Comparative Valuation Ratios*  
*Price-to-Book Ratio / Price-to-Cash-Flow Ratio / Price-to-Sales Ratio*
- 18.5 Free Cash Flow Valuation Approaches 595**  
*Comparing the Valuation Models / The Problem with DCF Models*
- 18.6 The Aggregate Stock Market 599**  
**End of Chapter Material 601–612**

Chapter 19

**Financial Statement Analysis 613**

- 19.1 The Major Financial Statements 613**  
*The Income Statement / The Balance Sheet / The Statement of Cash Flows*
- 19.2 Measuring Firm Performance 618**
- 19.3 Profitability Measures 619**  
*Return on Assets, ROA / Return on Capital, ROC / Return on Equity, ROE / Financial Leverage and ROE / Economic Value Added*
- 19.4 Ratio Analysis 623**  
*Decomposition of ROE / Turnover and Other Asset Utilization Ratios / Liquidity Ratios / Market Price Ratios: Growth versus Value / Choosing a Benchmark*
- 19.5 An Illustration of Financial Statement Analysis 633**
- 19.6 Comparability Problems 636**  
*Inventory Valuation / Depreciation / Inflation and Interest Expense / Fair Value Accounting / Quality of Earnings and Accounting Practices / International Accounting Conventions*
- 19.7 Value Investing: The Graham Technique 642**  
**End of Chapter Material 643–656**

PART VI

**Options, Futures, and Other Derivatives 657**

Chapter 20

**Options Markets: Introduction 657**

- 20.1 The Option Contract 657**  
*Options Trading / American and European Options / Adjustments in Option Contract Terms / The Options Clearing Corporation / Other Listed Options*

*Index Options / Futures Options / Foreign Currency Options / Interest Rate Options*

- 20.2 Values of Options at Expiration 663**  
*Call Options / Put Options / Option versus Stock Investments*
- 20.3 Option Strategies 667**  
*Protective Put / Covered Calls / Straddle / Spreads / Collars*
- 20.4 The Put-Call Parity Relationship 675**
- 20.5 Option-Like Securities 678**  
*Callable Bonds / Convertible Securities / Warrants / Collateralized Loans / Levered Equity and Risky Debt*
- 20.6 Financial Engineering 684**
- 20.7 Exotic Options 686**  
*Asian Options / Barrier Options / Lookback Options / Currency-Translated Options / Digital Options*  
**End of Chapter Material 687–698**

Chapter 21

**Option Valuation 699**

- 21.1 Option Valuation: Introduction 699**  
*Intrinsic and Time Values / Determinants of Option Values*
- 21.2 Restrictions on Option Values 703**  
*Restrictions on the Value of a Call Option / Early Exercise and Dividends / Early Exercise of American Puts*
- 21.3 Binomial Option Pricing 706**  
*Two-State Option Pricing / Generalizing the Two-State Approach / Making the Valuation Model Practical*
- 21.4 Black-Scholes Option Valuation 714**  
*The Black-Scholes Formula / Dividends and Call Option Valuation / Put Option Valuation / Dividends and Put Option Valuation*
- 21.5 Using the Black-Scholes Formula 722**  
*Hedge Ratios and the Black-Scholes Formula / Portfolio Insurance / Option Pricing and the Crisis of 2008–2009 / Option Pricing and Portfolio Theory / Hedging Bets on Mispriced Options*
- 21.6 Empirical Evidence on Option Pricing 734**  
**End of Chapter Material 735–746**

Chapter 22

**Futures Markets 747**

- 22.1 The Futures Contract 747**  
*The Basics of Futures Contracts / Existing Contracts*
- 22.2 Trading Mechanics 753**  
*The Clearinghouse and Open Interest / The Margin Account and Marking to Market / Cash versus Actual Delivery / Regulations / Taxation*

- 22.3 Futures Markets Strategies 757**  
*Hedging and Speculation / Basis Risk and Hedging*
- 22.4 Futures Prices 761**  
*The Spot-Futures Parity Theorem / Spreads / Forward versus Futures Pricing*
- 22.5 Futures Prices versus Expected Spot Prices 768**  
*Expectations Hypothesis / Normal Backwardation / Contango / Modern Portfolio Theory*  
**End of Chapter Material 770–774**

Chapter 23

**Futures, Swaps, and Risk Management 775**

- 23.1 Foreign Exchange Futures 775**  
*The Markets / Interest Rate Parity / Direct versus Indirect Quotes / Using Futures to Manage Exchange Rate Risk*
- 23.2 Stock-Index Futures 783**  
*The Contracts / Creating Synthetic Stock Positions: An Asset Allocation Tool / Index Arbitrage / Using Index Futures to Hedge Market Risk*
- 23.3 Interest Rate Futures 788**  
*Hedging Interest Rate Risk*
- 23.4 Swaps 790**  
*Swaps and Balance Sheet Restructuring / The Swap Dealer / Other Interest Rate Contracts / Swap Pricing / Credit Risk in the Swap Market / Credit Default Swaps*
- 23.5 Commodity Futures Pricing 797**  
*Pricing with Storage Costs / Discounted Cash Flow Analysis for Commodity Futures*  
**End of Chapter Material 801–810**

PART VII

**Applied Portfolio Management 811**

Chapter 24

**Portfolio Performance Evaluation 811**

- 24.1 The Conventional Theory of Performance Evaluation 811**  
*Average Rates of Return / Time-Weighted Returns versus Dollar-Weighted Returns / Adjusting Returns for Risk / The Sharpe Ratio for Overall Portfolios*  
*The  $M^2$  Measure and the Sharpe Ratio*  
*The Treynor Ratio*  
*The Information Ratio*  
*The Role of Alpha in Performance Measures / Implementing Performance Measurement: An Example / Realized Returns versus Expected Returns*

- 24.2 Style Analysis 823**
- 24.3 Performance Measurement with Changing Portfolio Composition 826**  
*Performance Manipulation and the Morningstar Risk-Adjusted Rating*
- 24.4 Market Timing**  
*The Potential Value of Market Timing / Valuing Market Timing as a Call Option / The Value of Imperfect Forecasting*
- 24.5 Performance Attribution Procedures 835**  
*Asset Allocation Decisions / Sector and Security Selection Decisions / Summing Up Component Contributions*  
**End of Chapter Material 841–852**

Chapter 25

**International Diversification 853**

- 25.1 Global Markets for Equities 853**  
*Developed Countries / Emerging Markets / Market Capitalization and GDP / Home-Country Bias*
- 25.2 Exchange Rate Risk and International Diversification 857**  
*Exchange Rate Risk / Investment Risk in International Markets / International Diversification / Are Benefits from International Diversification Preserved in Bear Markets?*
- 25.3 Political Risk 868**
- 25.4 International Investing and Performance Attribution 871**  
*Constructing a Benchmark Portfolio of Foreign Assets / Performance Attribution*  
**End of Chapter Material 875–880**

Chapter 26

**Hedge Funds 881**

- 26.1 Hedge Funds versus Mutual Funds 882**  
*Transparency / Investors / Investment Strategies / Liquidity / Compensation Structure*
- 26.2 Hedge Fund Strategies 883**  
*Directional and Nondirectional Strategies / Statistical Arbitrage*
- 26.3 Portable Alpha 886**  
*An Example of a Pure Play*
- 26.4 Style Analysis for Hedge Funds 889**
- 26.5 Performance Measurement for Hedge Funds 891**  
*Liquidity and Hedge Fund Performance / Hedge Fund Performance and Survivorship Bias / Hedge Fund Performance and Changing Factor Loadings / Tail Events and Hedge Fund Performance*
- 26.6 Fee Structure in Hedge Funds 899**  
**End of Chapter Material 902–906**

Chapter 27

**The Theory of Active Portfolio Management 907**

- 27.1 Optimal Portfolios and Alpha Values 907**  
*Forecasts of Alpha Values and Extreme Portfolio Weights / Restriction of Benchmark Risk*
- 27.2 The Treynor-Black Model and Forecast Precision 914**  
*Adjusting Forecasts for the Precision of Alpha / Distribution of Alpha Values / Organizational Structure and Performance*
- 27.3 The Black-Litterman Model 918**  
*Black-Litterman Asset Allocation Decision / Step 1: The Covariance Matrix from Historical Data / Step 2: Determination of a Baseline Forecast / Step 3: Integrating the Manager's Private Views / Step 4: Revised (Posterior) Expectations / Step 5: Portfolio Optimization*
- 27.4 Treynor-Black versus Black-Litterman: Complements, Not Substitutes 923**  
*The BL Model as Icing on the TB Cake / Why Not Replace the Entire TB Cake with the BL Icing?*
- 27.5 The Value of Active Management 925**  
*A Model for the Estimation of Potential Fees / Results from the Distribution of Actual Information Ratios / Results from Distribution of Actual Forecasts*
- 27.6 Concluding Remarks on Active Management 927**  
**End of Chapter Material 927–928**  
**Appendix A: Forecasts and Realizations of Alpha 928**  
**Appendix B: The General Black-Litterman Model 929**

Chapter 28

**Investment Policy and the Framework of the CFA Institute 931**

- 28.1 The Investment Management Process 932**  
*Objectives / Individual Investors / Personal Trusts / Mutual Funds / Pension Funds / Endowment Funds / Life Insurance Companies / Non-Life Insurance Companies / Banks*

- 28.2 Constraints 937**  
*Liquidity / Investment Horizon / Regulations / Tax Considerations / Unique Needs*
- 28.3 Policy Statements 939**  
*Sample Policy Statements for Individual Investors*
- 28.4 Asset Allocation 943**  
*Taxes and Asset Allocation 944*
- 28.5 Managing Portfolios of Individual Investors 945**  
*Human Capital and Insurance / Investment in Residence / Saving for Retirement and the Assumption of Risk / Retirement Planning Models / Manage Your Own Portfolio or Rely on Others? / Tax Sheltering*  
*The Tax-Deferral Option / Tax-Protected Retirement Plans / Deferred Annuities / Variable and Universal Life Insurance*
- 28.6 Pension Funds 951**  
*Defined Contribution Plans / Defined Benefit Plans / Pension Investment Strategies*  
*Investing in Equities / Wrong Reasons to Invest in Equities*
- 28.7 Investments for the Long Run 954**  
*Making Simple Investment Choices / Inflation Risk and Long-Term Investors*
- End of Chapter Material 956–966**

**REFERENCES TO CFA PROBLEMS 967**

**GLOSSARY G-1**

**NAME INDEX I-1**

**SUBJECT INDEX I-4**

**FORMULAS F-1**