

Investments

T W E L F T H E D I T I O N

ZVI BODIE

Boston University

ALEX KANE

University of California, San Diego

ALAN J. MARCUS

Boston College

**Mc
Graw
Hill**

Brief Contents

Preface xvi

PART I

Introduction 1

1	
The Investment Environment	1
2	
Asset Classes and Financial Instruments	29
3	
How Securities Are Traded	59
4	
Mutual Funds and Other Investment Companies	93

PART II

Portfolio Theory and Practice 119

5	
Risk, Return, and the Historical Record	119
6	
Capital Allocation to Risky Assets	159
7	
Efficient Diversification	193
8	
Index Models	243

PART III

Equilibrium in Capital Markets 275

9	
The Capital Asset Pricing Model	275
10	
Arbitrage Pricing Theory and Multifactor Models of Risk and Return	307
11	
The Efficient Market Hypothesis	331
12	
Behavioral Finance and Technical Analysis	371
13	
Empirical Evidence on Security Returns	395

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	615

PART VI

Options, Futures, and Other Derivatives 659

20	
Options Markets: Introduction	659
21	
Option Valuation	701
22	
Futures Markets	749
23	
Futures, Swaps, and Risk Management	777

PART VII

Applied Portfolio Management 813

24	
Portfolio Performance Evaluation	813
25	
International Diversification	853
26	
Hedge Funds	881
27	
The Theory of Active Portfolio Management	905
28	
Investment Policy and the Framework of the CFA Institute	929

REFERENCES TO CFA PROBLEMS 965

GLOSSARY G-1

NAME INDEX I-1

SUBJECT INDEX I-4

NOTATION, 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 / Fintech and Financial Innovation*
- 1.7 The Financial Crisis of 2008-2009 16
 - 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 24
 - End of Chapter Material 24–28

Chapter 2

Asset Classes and Financial Instruments 29

- 2.1 The Money Market 29
 - 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 / Money Market Funds

2.2 The Bond Market 35

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

2.3 Equity Securities 42

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

2.4 Stock and Bond Market Indexes 45

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 52

Options / Futures Contracts

End of Chapter Material 54–58

Chapter 3

How Securities Are Traded 59

3.1 How Firms Issue Securities 59

Privately Held Firms / Publicly Traded Companies / Shelf Registration / Initial Public Offerings

3.2 How Securities Are Traded 64

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/DMM Markets

- 3.3 The Rise of Electronic Trading 68**
- 3.4 U.S. Markets 70**
NASDAQ / The New York Stock Exchange / ECNs
- 3.5 New Trading Strategies 72**
Algorithmic Trading / High-Frequency Trading / Dark Pools / Bond Trading
- 3.6 Globalization of Stock Markets 75**
- 3.7 Trading Costs 76**
- 3.8 Buying on Margin 77**
- 3.9 Short Sales 80**
- 3.10 Regulation of Securities Markets 84**
Self-Regulation / The Sarbanes-Oxley Act / Insider Trading
- End of Chapter Material 88–92**

Chapter 4

Mutual Funds and Other Investment Companies 93

- 4.1 Investment Companies 93**
- 4.2 Types of Investment Companies 94**
Unit Investment Trusts / Managed Investment Companies / Other Investment Organizations
Commingled Funds / Real Estate Investment Trusts (REITs) / Hedge Funds
- 4.3 Mutual Funds 97**
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 101**
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 104**
- 4.6 Exchange-Traded Funds 105**
- 4.7 Mutual Fund Investment Performance: A First Look 108**
- 4.8 Information on Mutual Funds 111**
- End of Chapter Material 114–118**

PART II

Portfolio Theory and Practice 119

Chapter 5

Risk, Return, and the Historical Record 119

- 5.1 Measuring Returns over Different Holding Periods 120**
Annual Percentage Rates / Continuous Compounding
- 5.2 Interest Rates and Inflation Rates 123**
Real and Nominal Rates of Interest / The Equilibrium Real Rate of Interest / Interest Rates and Inflation / Taxes and the Real Rate of Interest / Treasury Bills and Inflation, 1926–2018
- 5.3 Risk and Risk Premiums 127**
Holding-Period Returns / Expected Return and Standard Deviation / Excess Returns and Risk Premiums
- 5.4 Learning from Historical Returns 131**
Time Series versus Scenario Analysis / Expected Returns and the Arithmetic Average / The Geometric (Time-Weighted) Average Return / Estimating Variance and Standard Deviation / Mean and Standard Deviation Estimates from Higher-Frequency Observations / The Reward-to-Volatility (Sharpe) Ratio
- 5.5 The Normal Distribution 136**
- 5.6 Deviations from Normality and Tail Risk 138**
Value at Risk / Expected Shortfall / Lower Partial Standard Deviation and the Sortino Ratio / Relative Frequency of Large, Negative 3-Sigma Returns
- 5.7 Historic Returns on Risky Portfolios 141**
A Global View of the Historical Record
- 5.8 Normality and Long-Term Investments 149**
Short-Run versus Long-Run Risk / Forecasts for the Long Haul
- End of Chapter Material 153–158**

Chapter 6

Capital Allocation to Risky Assets 159

- 6.1 Risk and Risk Aversion 160**
Risk, Speculation, and Gambling / Risk Aversion and Utility Values / Estimating Risk Aversion
- 6.2 Capital Allocation across Risky and Risk-Free Portfolios 165**
- 6.3 The Risk-Free Asset 168**

- 6.4 **Portfolios of One Risky Asset and a Risk-Free Asset** 168
- 6.5 **Risk Tolerance and Asset Allocation** 171
Non-Normal Returns
- 6.6 **Passive Strategies: The Capital Market Line** 177
End of Chapter Material 179–187
Appendix A: Risk Aversion, Expected Utility, and the St. Petersburg Paradox 188

Chapter 7

Efficient Diversification 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 Time Diversification** 217
Risk Sharing versus Risk Pooling / Time Diversification
End of Chapter Material 220–230
Appendix A: A Spreadsheet Model for Efficient Diversification 230
Appendix B: Review of Portfolio Statistics 235

Chapter 8

Index Models 243

- 8.1 **A Single-Factor Security Market** 244
The Input List of the Markowitz Model / Systematic versus Firm-Specific Risk
- 8.2 **The Single-Index Model** 246
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** 253
The Security Characteristic Line for Amazon / The Explanatory Power of Amazon’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** 257
Predicting Betas

- 8.5 **Portfolio Construction Using the Single-Index Model** 260
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 269–274

PART III

Equilibrium in Capital Markets 275

Chapter 9

The Capital Asset Pricing Model 275

- 9.1 **The Capital Asset Pricing Model** 275
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** 286
Identical Input Lists / Risk-Free Borrowing and the Zero-Beta Model / Labor Income and Other Nontraded Assets / A Multiperiod Model and Hedge Portfolios / A Consumption-Based CAPM / Liquidity and the CAPM
- 9.3 **The CAPM and the Academic World** 296
- 9.4 **The CAPM and the Investment Industry** 297
End of Chapter Material 298–306

Chapter 10

Arbitrage Pricing Theory and Multifactor Models of Risk and Return 307

- 10.1 **Multifactor Models: A Preview** 308
Factor Models of Security Returns
- 10.2 **Arbitrage Pricing Theory** 310
Arbitrage, Risk Arbitrage, and Equilibrium / Diversification in a Single-Factor Security Market / Well-Diversified Portfolios / The Security Market Line of the APT
Individual Assets and the APT
Well-Diversified Portfolios in Practice
- 10.3 **The APT and the CAPM** 317
- 10.4 **A Multifactor APT** 318

- 10.5 The Fama-French (FF) Three-Factor Model 321**
Estimating and Implementing a Three-Factor SML / Smart Betas and Multifactor Models
End of Chapter Material 325–330

Chapter 11

The Efficient Market Hypothesis 331

- 11.1 Random Walks and Efficient Markets 332**
Competition as the Source of Efficiency / Versions of the Efficient Market Hypothesis
- 11.2 Implications of the EMH 336**
Technical Analysis / Fundamental Analysis / Active versus Passive Portfolio Management / The Role of Portfolio Management in an Efficient Market / Resource Allocation
- 11.3 Event Studies 341**
- 11.4 Are Markets Efficient? 345**
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 and Liquidity Effects / Book-to-Market Ratios / Post-Earnings-Announcement Price Drift / Other Predictors of Stock Returns
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 358**
Stock Market Analysts / Mutual Fund Managers / So, Are Markets Efficient?
End of Chapter Material 363–370

Chapter 12

Behavioral Finance and Technical Analysis 371

- 12.1 The Behavioral Critique 372**
Information Processing
Limited Attention, Underreaction, and Overreaction / Overconfidence / Conservatism / Extrapolation and Pattern Recognition

- Behavioral Biases*
Framing / Mental Accounting / Regret Avoidance / Affect and Feelings / 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 382**
Trends and Corrections
Momentum and Moving Averages / Relative Strength / Breadth
Sentiment Indicators
Trin Statistic / Confidence Index / Short Interest / Put/Call Ratio
A Warning
End of Chapter Material 389–394

Chapter 13

Empirical Evidence on Security Returns 395

- 13.1 The Index Model and the Single-Factor SML 396**
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 401**
Labor Income / Private (Nontraded) Business / Early Tests of the Multifactor CAPM and APT / A Macro Factor Model
- 13.3 Fama-French-Type Factor Models 405**
Size and B/M as Risk Factors / Behavioral Explanations / Momentum: A Fourth Factor / Characteristics versus Factor Sensitivities
- 13.4 Liquidity and Asset Pricing 413**
- 13.5 Consumption-Based Asset Pricing and the Equity Premium Puzzle 415**
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 421–424

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 549

*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 / The Cyclically Adjusted P/E Ratio / 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 596**
Comparing the Valuation Models / The Problem with DCF Models
- 18.6 The Aggregate Stock Market 601**
End of Chapter Material 603–614

Chapter 19

Financial Statement Analysis 615

- 19.1 The Major Financial Statements 615**
The Income Statement / The Balance Sheet / The Statement of Cash Flows
- 19.2 Measuring Firm Performance 620**
- 19.3 Profitability Measures 621**
Return on Assets, ROA / Return on Capital, ROC / Return on Equity, ROE / Financial Leverage and ROE / Economic Value Added
- 19.4 Ratio Analysis 625**
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 635**
- 19.6 Comparability Problems 638**
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 644**
End of Chapter Material 645–658

PART VI

Options, Futures, and Other Derivatives 659

Chapter 20

Options Markets: Introduction 659

- 20.1 The Option Contract 659**
Options Trading / American versus 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 665**
Call Options / Put Options / Option versus Stock Investments
- 20.3 Option Strategies 669**
Protective Put / Covered Calls / Straddle / Spreads / Collars
- 20.4 The Put-Call Parity Relationship 677**
- 20.5 Option-Like Securities 680**
Callable Bonds / Convertible Securities / Warrants / Collateralized Loans / Levered Equity and Risky Debt
- 20.6 Financial Engineering 686**
- 20.7 Exotic Options 688**
Asian Options / Barrier Options / Lookback Options / Currency-Translated Options / Digital Options
End of Chapter Material 689–700

Chapter 21

Option Valuation 701

- 21.1 Option Valuation: Introduction 701**
Intrinsic and Time Values / Determinants of Option Values
- 21.2 Restrictions on Option Values 705**
Restrictions on the Value of a Call Option / Early Exercise and Dividends / Early Exercise of American Puts
- 21.3 Binomial Option Pricing 708**
Two-State Option Pricing / Generalizing the Two-State Approach / Making the Valuation Model Practical
- 21.4 Black-Scholes Option Valuation 716**
The Black-Scholes Formula / Dividends and Call Option Valuation / Put Option Valuation / Dividends and Put Option Valuation

- 21.5 Using the Black-Scholes Formula 724**
Hedge Ratios and the Black-Scholes Formula / Portfolio Insurance / Option Pricing and the Financial Crisis / Option Pricing and Portfolio Theory / Hedging Bets on Mispriced Options
- 21.6 Empirical Evidence on Option Pricing 736**
End of Chapter Material 737–748

Chapter 22

Futures Markets 749

- 22.1 The Futures Contract 749**
The Basics of Futures Contracts / Existing Contracts
- 22.2 Trading Mechanics 755**
The Clearinghouse and Open Interest / The Margin Account and Marking to Market / Cash versus Actual Delivery / Regulations / Taxation
- 22.3 Futures Markets Strategies 759**
Hedging and Speculation / Basis Risk and Hedging
- 22.4 Futures Prices 763**
The Spot-Futures Parity Theorem / Spreads / Forward versus Futures Pricing
- 22.5 Futures Prices versus Expected Spot Prices 770**
Expectations Hypothesis / Normal Backwardation / Contango / Modern Portfolio Theory
- End of Chapter Material 772–776**

Chapter 23

Futures, Swaps, and Risk Management 777

- 23.1 Foreign Exchange Futures 777**
The Markets / Interest Rate Parity / Direct versus Indirect Quotes / Using Futures to Manage Exchange Rate Risk
- 23.2 Stock-Index Futures 785**
The Contracts / Creating Synthetic Stock Positions: An Asset Allocation Tool / Index Arbitrage / Using Index Futures to Hedge Market Risk
- 23.3 Interest Rate Futures 790**
Hedging Interest Rate Risk
- 23.4 Swaps 792**
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 799**
Pricing with Storage Costs / Discounted Cash Flow Analysis for Commodity Futures
- End of Chapter Material 803–812**

PART VII

Applied Portfolio Management 813

Chapter 24

Portfolio Performance Evaluation 813

- 24.1 The Conventional Theory of Performance Evaluation 813**
Average Rates of Return / Time-Weighted Returns versus Dollar-Weighted Returns / Adjusting Returns for Risk / Risk-Adjusted Performance Measures / The Sharpe Ratio for Overall Portfolios
The M² 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 / Selection Bias and Portfolio Evaluation
- 24.2 Style Analysis 825**
- 24.3 Performance Measurement with Changing Portfolio Composition 827**
Performance Manipulation and the Morningstar Risk-Adjusted Rating
- 24.4 Market Timing 831**
The Potential Value of Market Timing / Valuing Market Timing as a Call Option / The Value of Imperfect Forecasting
- 24.5 Performance Attribution Procedures 836**
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 versus Nondirectional Strategies / Statistical Arbitrage / High-Frequency Strategies
Electronic News Feeds / Cross-Market Arbitrage / Electronic Market Making / Electronic “Front Running”
- 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 Selection Bias / Hedge Fund Performance and Changing Factor Loadings / Tail Events and Hedge Fund Performance
- 26.6 Fee Structure in Hedge Funds 898**
End of Chapter Material 901–904

Chapter 27

The Theory of Active Portfolio Management 905

- 27.1 Optimal Portfolios and Alpha Values 905**
Forecasts of Alpha Values and Extreme Portfolio Weights / Restriction of Benchmark Risk
- 27.2 The Treynor-Black Model and Forecast Precision 912**
Adjusting Forecasts for the Precision of Alpha / Distribution of Alpha Values / Organizational Structure and Performance
- 27.3 The Black-Litterman Model 916**
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 921**
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 923**
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 925**
End of Chapter Material 925–926
Appendix A: Forecasts and Realizations of Alpha 926
Appendix B: The General Black-Litterman Model 927

Chapter 28

Investment Policy and the Framework of the CFA Institute 929

- 28.1 The Investment Management Process 930**
Objectives
- 28.2 Major Investor Types 932**
Individual Investors / Personal Trusts / Mutual Funds / Pension Funds / Endowment Funds / Life Insurance Companies / Non-Life Insurance Companies / Banks
- 28.3 Constraints 935**
Liquidity / Investment Horizon / Regulations / Tax Considerations / Unique Needs
- 28.4 Policy Statements 938**
Sample Policy Statements for Individual Investors
- 28.5 Asset Allocation 942**
Taxes and Asset Allocation
- 28.6 Managing Portfolios of Individual Investors 944**
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
- 28.7 Pension Funds 950**
Defined Contribution Plans / Defined Benefit Plans / Pension Investment Strategies
Investing in Equities / Wrong Reasons to Invest in Equities
- 28.8 Investments for the Long Run 953**
Target Date Funds / Inflation Risk and Long-Term Investors
End of Chapter Material 954–964

REFERENCES TO CFA PROBLEMS 965

GLOSSARY G-1

NAME INDEX I-1

SUBJECT INDEX I-4

NOTATION, FORMULAS F-1