RISK MANAGEMENT AND INVESTMENT MANAGEMENT

PART II EXAM WEIGHT | 15% (IM)

This area focuses on risk management techniques applied to the investment management process. The broad knowledge points covered in Risk Management and Investment Management include the following:

- Factor theory
- Portfolio construction
- Portfolio risk measures
- Risk budgeting
- Risk monitoring and performance measurement
- Portfolio-based performance analysis
- Hedge funds

The readings that you should focus on for this section and the specific learning objectives to achieve with each reading are:

Andrew Ang, *Asset Management: A Systematic Approach to Factor Investing* (New York, NY: Oxford University Press, 2014).

Chapter 6. Factor Theory [IM–1]

After completing this reading, you should be able to:

- Provide examples of factors that impact asset prices and explain the theory of factor risk premiums.
- Discuss the capital asset pricing model (CAPM) including its assumptions and explain how factor risk is addressed in the CAPM.
- Explain the implications of using the CAPM to value assets, including equilibrium and optimal holdings, exposure to factor risk, its treatment of diversification benefits, and shortcomings of the CAPM.
- Describe multifactor models and compare and contrast multifactor models to the CAPM.
- Explain how stochastic discount factors are created and apply them in the valuation of assets.
- Describe efficient market theory and explain how markets can be inefficient.

Chapter 7. Factors [IM–2]

After completing this reading, you should be able to:

- Describe the process of value investing and explain why a value premium may exist.
- Explain how different macroeconomic risk factors, including economic growth, inflation, and volatility, affect asset returns and risk premiums.
- Assess methods of mitigating volatility risk in a portfolio and describe challenges that arise when managing volatility risk.
- Explain how dynamic risk factors can be used in a multifactor model of asset returns, using the Fama-French model as an example.
- Compare value and momentum investment strategies, including their return and risk profiles.

Chapter 10. Alpha (and the Low-Risk Anomaly) [IM–3]

After completing this reading, you should be able to:

- Describe and evaluate the low-risk anomaly of asset returns.
- Define and calculate alpha, tracking error, the information ratio, and the Sharpe ratio.
- Explain the impact of benchmark choice on alpha and describe characteristics of an effective benchmark to measure alpha.
- Describe Grinold's fundamental law of active management, including its assumptions and limitations, and calculate the information ratio using this law.
- Apply a factor regression to construct a benchmark with multiple factors, measure a portfolio's sensitivity to those factors, and measure alpha against that benchmark.
- Explain how to use style analysis to handle time-varying factor exposures.
- Describe issues that arise when measuring alphas for nonlinear strategies.
- Compare the volatility anomaly and the beta anomaly and analyze evidence of each anomaly.
- Describe potential explanations for the risk anomaly.

Richard Grinold and Ronald Kahn, *Active Portfolio Management: A Quantitative Approach for Producing Superior Returns and Controlling Risk, 2nd Edition* (New York, NY: McGraw-Hill, 2000).
Chapter 14. Portfolio Construction [IM–4]

After completing this reading, you should be able to:

- Distinguish among the inputs to the portfolio construction process.
- Evaluate the motivation for and the methods used for refining alphas in the implementation process.
- Describe neutralization and the different approaches used for refining alphas to be neutral.
- Describe the implications of transaction costs on portfolio construction.
- Describe practical issues in portfolio construction, including the determination of an appropriate risk aversion, aversions to specific risks, and proper alpha coverage.
- Describe portfolio revisions and rebalancing, and analyze the tradeoffs between alpha, risk, transaction costs, and time horizon.
- Determine the optimal no-trade region for rebalancing with transaction costs.
- Evaluate the strengths and weaknesses of the following portfolio construction techniques: screens, stratification, linear programming, and quadratic programming.
- Describe dispersion, explain its causes, and describe methods for controlling forms of dispersion.

Philippe Jorion, *Value-at-Risk: The New Benchmark for Managing Financial Risk, 3rd Edition* (New York, NY: McGraw-Hill, 2007).
Chapter 7. Portfolio Risk: Analytical Methods [IM–5]

After completing this reading, you should be able to:

- Define, calculate, and distinguish between the following portfolio VaR measures: diversified and undiversified portfolio VaR, individual VaR, incremental VaR, marginal VaR, and component VaR.
- Explain the impact of correlation on portfolio risk.
- Apply the concept of marginal VaR in making portfolio management decisions.
- Explain the risk-minimizing position and the risk and return-optimizing position of a portfolio.
- Explain the difference between risk management and portfolio management and describe how to use marginal VaR in portfolio management.

Chapter 17. VaR and Risk Budgeting in Investment Management [IM–6]

After completing this reading, you should be able to:

- Define risk budgeting.
- Describe the impact of horizon, turnover, and leverage on the risk management process in the investment management industry.
- Describe the investment process of large investors such as pension funds.
- Describe the risk management challenges associated with investments in hedge funds.
- Distinguish among the following types of risk: absolute risk, relative risk, policy-mix risk, active management risk, funding risk, and sponsor risk.
- Explain the use of VaR to check manager compliance and monitor risk.
- Explain how VaR can be used in the development of investment guidelines and for improving the investment process.
- Describe the risk budgeting process and calculate risk budgets across asset classes and active managers.

Robert Litterman and the Quantitative Resources Group, *Modern Investment Management: An Equilibrium Approach* (Hoboken, NJ: John Wiley & Sons, 2003).

Chapter 17. Risk Monitoring and Performance Measurement [IM–7]

After completing this reading, you should be able to:

- Describe the three fundamental dimensions behind risk management, and their relation to VaR and tracking error.
- Describe risk planning, including its objectives, effects, and the participants in its development.
- Describe risk budgeting and the role of quantitative methods in risk budgeting.
- Describe risk monitoring and its role in an internal control environment.
- Identify sources of risk consciousness within an organization.
- Describe the objectives and actions of a risk management unit in an investment management firm.
- Describe how risk monitoring can confirm that investment activities are consistent with expectations.
- Describe the Liquidity Duration Statistic and how it can be used to measure liquidity.
- Describe the objectives of performance measurement tools.
- Describe the use of alpha, benchmarks, and peer groups as inputs in performance measurement tools.

Zvi Bodie, Alex Kane, and Alan J. Marcus, *Investments, 12th Edition* (New York, NY: McGraw-Hill, 2020).

Chapter 24. Portfolio Performance Evaluation [IM–8]

After completing this reading, you should be able to:

- Differentiate between the time-weighted and dollar-weighted returns of a portfolio and describe their appropriate uses.
- Describe risk-adjusted performance measures, such as Sharpe's measure, Treynor's measure, Jensen's measure (Jensen's alpha), and the information ratio and identify the circumstances under which the use of each measure is most relevant.
- Describe the uses for the Modigliani-squared and Treynor's measure in comparing two portfolios and the graphical representation of these measures.
- Determine the statistical significance of a performance measure using standard error and the t-statistic.
- Describe style analysis.
- Explain the difficulties in measuring the performance of actively managed portfolios.
- Describe performance manipulation and the problems associated with using conventional performance measures.
- Describe techniques to measure the market timing ability of fund managers with a regression and with a call option model and compute return due to market timing.
- Describe and apply performance attribution procedures, including the asset allocation decision, sector and security selection decision, and the aggregate contribution.

G. Constantinides, M. Harris and R. Stulz, eds., *Handbook of the Economics of Finance, Volume 2B* **(Oxford, UK: Elsevier, 2013).**

Chapter 17. Hedge Funds [IM–9]

After completing this reading, you should be able to:

- Explain biases that are commonly found in databases of hedge funds.
- Explain the evolution of the hedge fund industry and describe landmark events that precipitated major changes in the development of the industry.
- Explain the impact of institutional investors on the hedge fund industry and assess reasons for the growing concentration of assets under management (AUM) in the industry.
- Explain the relationship between risk and alpha in hedge funds.
- Compare and contrast the different hedge fund strategies, describe their return characteristics, and describe the inherent risks of each strategy.
- Describe the historical portfolio construction and performance trends of hedge funds compared to those of equity indices.
- Describe market events that resulted in a convergence of risk factors for different hedge fund strategies and explain the impact of such convergences on portfolio diversification strategies.
- Describe the problem of risk sharing asymmetry between principals and agents in the hedge fund industry.

Kevin R. Mirabile, *Hedge Fund Investing: A Practical Approach to Understanding Investor Motivation, Manager Profits, and Fund Performance, 2nd Edition* **(Hoboken, NJ: Wiley Finance, 2016).**

Chapter 12. Performing Due Diligence on Specific Managers and Funds [IM–10]

After completing this reading, you should be able to:

- Identify reasons for the failures of hedge funds in the past.
- Explain elements of the due diligence process used to assess investment managers.
- Identify themes and questions investors can consider when evaluating a hedge fund manager.
- Describe criteria that can be evaluated in assessing a hedge fund's risk management process.
- Explain how due diligence can be performed on a hedge fund's operational environment.
- Explain how a hedge fund's business model risk and its fraud risk can be assessed.
- Describe elements that can be included as part of a due diligence questionnaire.

Stephen G. Dimmock and William C. Gerken, *Finding Bernie Madoff: Predicting Fraud by Investment Managers,* **(2012) [IM–11]**

After completing this reading, you should be able to:

- Explain the use and efficacy of information disclosures made by investment advisors in predicting fraud.
- Describe the barriers and the costs incurred in implementing fraud prediction methods.
- Discuss ways to improve investors' ability to use disclosed data to predict fraud.