

# QFI – Investment Risk Management Exam

Spring 2024/Fall 2024

## Important Exam Information:

<a href="#">Exam Registration</a>	Candidates may register online or with an application.
<a href="#">Order Study Notes</a>	Study notes are part of the required syllabus and are not available electronically but may be purchased through the online store.
Syllabus Readings	Readings listed in this syllabus may include study notes, online readings and textbooks. Candidates are responsible for all readings in their entirety, including sections such as Appendices, unless it is stated otherwise in the syllabus.
<a href="#">Introductory Study Note</a>	The Introductory Study Note has a complete listing of all study notes as well as errata and other important information.
Case Study	A case study will not be provided with the examination.
<a href="#">Past Exams</a>	Past Exams from Fall 2020-present are available on SOA website.
<a href="#">Updates</a>	Candidates should be sure to check for updates on the Exam Study page periodically for additional corrections or notices to the current syllabus.
<a href="#">Formula Package</a>	A Formula Package will be provided with the exam. Please see the Introductory Study Note for more information.

<b>1. Topic: Identification of Risk Types</b>
<b>Learning Objectives</b>
The candidate will understand and be able to identify and describe types of risk present in investment management.
<b>Learning Outcomes</b>
The Candidate will be able to: a) Identify and describe the various kinds of risks, including strategic, market, credit, operational, liquidity etc. b) Describe and apply various risk identification tools c) Identify behavioral risks and explain how they factor into investment management d) Identify environmental, social and governance (ESG) risks and explain how they factor into investment management
<b>Resources</b>
<ul style="list-style-type: none"><li>• <i>Financial Enterprise Risk Management</i>, Sweeting, Paul, 2<sup>nd</sup> Edition, 2017<ul style="list-style-type: none"><li>○ Ch. 8: Risk Identification</li></ul></li><li>• <i>Quantitative Enterprise Risk Management</i>, Hardy, Mary and Saunders, David, 2022<ul style="list-style-type: none"><li>○ Ch. 2: Risk Taxonomy</li><li>○ Ch. 19: Behavioural Risk Management</li></ul></li><li>• QFII-131-24: Chapter 1 Introduction to ESG (pp. 3-36)</li></ul>

## 2. Topic: Risk Measurement and Assessment

### Learning Objectives

The candidate will understand and be able to apply different approaches to measuring and assessing risk exposures.

### Learning Outcomes

The Candidate will be able to:

- a) Explain the advantages and limitations of different risk metrics
- b) Explain how different approaches and tests form a set of complementary investment risk metrics
- c) Analyze and evaluate the use and misuse of correlation, integrated risk distributions and copulas
- d) Explain the difference between real-world and risk-neutral processes and select appropriate market risk models
- e) Evaluate and apply credit risk models
- f) Evaluate a company's or a portfolio's exposures to various risks, including liquidity risk
- g) Apply different techniques of assessing tail risks, including stress testing and scenario analysis

### Resources

- *Credit Risk Modeling*, Bolder, David, 2018
  - Ch. 1: Getting started (background)
  - Ch. 2: A Natural First Step
  - Ch. 3: Mixture or Actuarial Models
  - Ch. 4: Threshold Models
- *Quantitative Enterprise Risk Management*, Hardy, Mary and Saunders, David, 2022
  - Ch. 3: Risk Measures
  - Ch. 6: Copulas
  - Ch. 7: Stress Testing
  - Ch. 8: Market Risk Models
- *Investment Risk Management*, Baker, Kent and Filbeck, Greg, 2015
  - Ch. 8: Liquidity Risk
- QFII-104-14: Correlation: Pitfalls and Alternatives
- QFII-110-15: The Devil is in the Tails: Actuarial Mathematics and the Subprime Mortgage Crisis
- QFII-123-21: IAA Note on Stress Testing and Scenario Analysis (pp. 1-6, 14-17, 19-26 & 32-39)

<b>3. Topic: Risk Management</b>
<b>Learning Objectives</b>
The candidate will understand and be able to apply the components of an effective risk management system to investment management.
<b>Learning Outcomes</b>
The Candidate will be able to: <ul style="list-style-type: none"><li>a) Explain the best practices of investment risk management</li><li>b) Identify and describe various approaches for managing portfolio risks including VaR/ES methods, position limits, etc.</li><li>c) Explain and manage model risk</li><li>d) Explain risk budgeting approach to portfolio construction</li><li>e) Apply principles of liquidity risk management</li></ul>
<b>Resources</b>
<ul style="list-style-type: none"><li>• <i>Quantitative Enterprise Risk Management</i>, Hardy, Mary and Saunders, David, 2022<ul style="list-style-type: none"><li>○ Ch. 9: Short Term Portfolio Risk</li><li>○ Ch. 14: Model Risk and Governance</li></ul></li><li>• <i>The Top Ten Operational Risks: A Survival Guide for Investment Management Firms and Hedge Funds</i>, Miller and Lawton, 2010</li><li>• QFII-119-19: Chapter 3 of <i>The Known, the Unknown, and the Unknowable in Financial Risk Management: Measurement and Theory Advancing Practice</i></li><li>• QFII-120-20: IAA Note on ERM for Capital and Solvency Purposes in the Insurance Industry, pp. 9-38</li><li>• QFII-129-23: Ch 2 “Risk Budgeting Approach” of <i>Introduction to Risk Parity and Risk Budgeting</i>, T. Roncalli</li><li>• QFII-132-24: Application Paper on Liquidity Risk Management (IAIS)</li></ul>

<b>4. Topic: Risk Mitigation</b>
<b>Learning Objectives</b>
The candidate will understand and be able to mitigate investment risks using derivatives
<b>Learning Outcomes</b>
The Candidate will: <ul style="list-style-type: none"><li>a) Be able to explain and implement techniques used to mitigate market risks</li><li>b) Understand interest rate derivatives and use them to mitigate interest rate risk and currency risk</li><li>c) Understand credit derivatives and use them to mitigate credit risk</li><li>d) Understand CDS valuations and marking-to-market counterparty risk in credit derivatives</li></ul>
<b>Resources</b>
<ul style="list-style-type: none"><li>• <i>Quantitative Enterprise Risk Management</i>, Hardy, Mary and Saunders, David, 2022<ul style="list-style-type: none"><li>○ Ch. 15: Risk mitigation using options and derivatives</li></ul></li><li>• <i>Fixed Income Securities: Valuation, Risk, and Risk Management</i>, Pietro Veronesi<ul style="list-style-type: none"><li>○ Ch. 5: Interest Rate Derivatives: Forwards and Swaps</li><li>○ Ch. 6: Interest Rate Derivatives: Futures and Options</li></ul></li><li>• <i>Investment Risk Management</i>, Baker, Kent and Filbeck, Greg, 2015<ul style="list-style-type: none"><li>○ Ch. 25: Futures</li><li>○ Ch. 26: Swaps</li></ul></li><li>• <i>Handbook of Fixed Income Securities</i>, Fabozzi, Frank J., 9<sup>th</sup> Edition, 2021<ul style="list-style-type: none"><li>○ Ch. 68: Credit Derivatives</li><li>○ Ch. 69: Credit Derivative Valuation and Risk</li></ul></li></ul>

<b>5. Topic: Risk Culture and Governance</b>
<b>Learning Objectives</b>
The candidate will understand the importance of risk culture and governance.
<b>Learning Outcomes</b>
The Candidate will be able to: <ul style="list-style-type: none"><li>a) Explain the importance of risk culture and ethics in an investment firm</li><li>b) Identify sources of unethical conduct and explain the role of a fiduciary</li><li>c) Compare the interests of key stakeholders and describe governance mechanisms that attempt to address conflicts</li><li>d) Explain how governance may be structured to gain competitive advantages and efficiencies</li><li>e) Explain and apply the lessons learned from risk management failures</li></ul>
<b>Resources</b>
<ul style="list-style-type: none"><li>• <i>Financial Enterprise Risk Management</i>, Sweeting, Paul, 2<sup>nd</sup> Edition, 2017<ul style="list-style-type: none"><li>○ Ch. 20: Case Studies (except 3 cases: Korean Air, Maxwell, Space shuttle)</li></ul></li><li>• <i>Investment Ethics</i>, Peck, Sarah, 2011<ul style="list-style-type: none"><li>○ Ch. 1-3, 7 &amp; 9 (Cases 1, 4, 5, 10, 13, 20, 21 &amp; 30)</li></ul></li><li>• QFII-101-14: Chapter 11 of <i>Strategic Management: An Integrated Approach</i>, Hill &amp; Jones, pp. 378-384 only, up to “Agency Theory” (including example 11.1 “Strategy in Action”)</li><li>• QFII-116-19: Chapter 45 of <i>Risk Management: Foundations for a Changing Financial World</i>, Haslett Jr., Walter V., 2010</li><li>• QFII-130-23: General American Life Can’t Pay Investors</li></ul>