2015

FRM Exam Study Guide

The designation recognized by risk management professionals worldwide

GARP | Global Association of Risk Professionals
Topic Outline, Readings, Test Weightings
The Study Guide sets forth primary topics and subtopics covered in the FRM Exam Part I and Part II. The topics were selected by the FRM Committee as ones that risk managers who work in practice today have to master. The topics and their respective weightings are reviewed yearly to ensure the Exams are timely and relevant. The Study Guide also contains a full listing of all of the readings that are recommended as preparation for the FRM Exam Part I and Part II. Key concepts appear as bullet points at the beginning of each section and are intended to help candidates identify the major themes and knowledge areas associated with that section.

FRM Exam Approach
The FRM Exams are practice-oriented. The questions are derived from a combination of theory, as set forth in the readings, and “real-world” work experience. Candidates are expected to understand risk management concepts and approaches, and how they would apply to a risk manager’s day-to-day activities. It is rare that a risk manager will be faced with an issue that can immediately be slotted into one category. In the real world, a risk manager must be able to identify any number of risk-related issues and be able to deal with them effectively. As such, the Exams are comprehensive in nature, testing a candidate on a number of risk management concepts and approaches.

Readings
Questions for the FRM Exams are related to and supported by the readings listed under each topic outline. These readings were selected by the FRM Committee to assist candidates in their review of the subjects covered by the Exams. It is strongly suggested that candidates review these readings in depth prior to sitting for each exam. All of the readings listed in the FRM Study Guide are available through GARP. Further information can be found at the GARP website.

FRM Exam Prep Providers
Some candidates may want to more formally review the materials with FRM Exam Preparation Providers (EPPs). A list of EPPs that have registered with GARP can be found at the GARP website. GARP does not endorse any Exam Preparation Provider but merely lists them as a service to FRM candidates.

On the following pages, an asterisk after a reading title indicates that the reading is freely available on the GARP website.
FRM EXAM
PART I

TOPICS

AND

READINGS
FOUNDATIONS OF RISK MANAGEMENT—PART I EXAM WEIGHT • 20%

- Basic risk types, measurement and management tools
- Creating value with risk management
- The role of risk management in corporate governance
- Enterprise Risk Management (ERM)
- Financial disasters and risk management failures
- The Capital Asset Pricing Model (CAPM)
- Risk-adjusted performance measurement
- Multi-factor models
- Information risk and data quality management
- Ethics and the GARP Code of Conduct

Readings for Foundations of Risk Management

   - Chapter 1. Risk Management: A Helicopter View (Including Appendix 1.1. Typology of Risk Exposures)
   - Chapter 2. Corporate Risk Management: A Primer
   - Chapter 4. Corporate Governance and Risk Management

   - Chapter 4. What is ERM?


   - Chapter 4. Financial Disasters

   - Chapter 6. The Credit Crisis of 2007


   - Chapter 13. The Standard Capital Asset Pricing Model
   • Chapter 4. Applying the CAPM to Performance Measurement: Single-Index Performance Measurement Indicators (Section 4.2 only)

   • Chapter 10. Arbitrage Pricing Theory and Multifactor Models of Risk and Return

    • Chapter 3. Information Risk and Data Quality Management

11. “Principles for Effective Data Aggregation and Risk Reporting,” (Basel Committee on Banking Supervision Publication, January 2013).*

12. GARP Code of Conduct.*
QUANTITATIVE ANALYSIS—PART I EXAM WEIGHT• 20%

- Discrete and continuous probability distributions
- Estimating the parameters of distributions
- Population and sample statistics
- Bayesian analysis
- Statistical inference and hypothesis testing
- Correlations and copulas
- Estimating correlation and volatility using EWMA and GARCH models
- Volatility term structures
- Linear regression with single and multiple regressors
- Time series analysis
- Simulation methods

Readings for Quantitative Analysis

   - Chapter 2. Probabilities
   - Chapter 3. Basic Statistics
   - Chapter 4. Distributions
   - Chapter 6. Bayesian Analysis (Pages 113-124 only)
   - Chapter 7. Hypothesis Testing and Confidence Intervals

   - Chapter 11. Correlations and Copulas

   - Chapter 4. Linear Regression with One Regressor
   - Chapter 5. Regression with a Single Regressor
   - Chapter 6. Linear Regression with Multiple Regressors
   - Chapter 7. Hypothesis Tests and Confidence Intervals in Multiple Regression

   - Chapter 5. Modeling and Forecasting Trend (Section 5.4 only—Selecting Forecasting Models Using the Akaike and Schwarz Criteria)
   - Chapter 7. Characterizing Cycles
   - Chapter 8. Modeling Cycles: MA, AR, and ARMA Models

   - Chapter 23. Estimating Volatilities and Correlations for Risk Management

   - Chapter 4. Simulation Modeling
FINANCIAL MARKETS AND PRODUCTS—PART I EXAM WEIGHT • 30%

- Structure and mechanics of OTC and exchange markets
- Structure, mechanics, and valuation of forwards, futures, swaps and options
- Hedging with derivatives
- Interest rates and measures of interest rate sensitivity
- Foreign exchange risk
- Corporate bonds
- Mortgage-backed securities
- Rating agencies

Readings for Financial Markets and Products

   - Chapter 1. Introduction: Futures and Options Markets
   - Chapter 2. Futures Industry Institutions and Professionals
   - Chapter 7. Hedging with Futures and Options

   - Chapter 1. Introduction
   - Chapter 2. Mechanics of Futures Markets
   - Chapter 3. Hedging Strategies Using Futures
   - Chapter 4. Interest Rates
   - Chapter 5. Determination of Forward and Futures Prices
   - Chapter 6. Interest Rate Futures
   - Chapter 7. Swaps
   - Chapter 10. Mechanics of Options Markets
   - Chapter 11. Properties of Stock Options
   - Chapter 12. Trading Strategies Involving Options
   - Chapter 26. Exotic Options

   - Chapter 6. Commodity Forwards and Futures

   - Chapter 13. Foreign Exchange Risk

   - Chapter 12. Corporate Bonds, by Frank Fabozzi, Steven Mann and Adam Cohen
   • Chapter 20. Mortgages and Mortgage-Backed Securities

   • Chapter 6. The Rating Agencies
VALUATION AND RISK MODELS—PART I EXAM WEIGHT • 30%

- Value-at-Risk (VaR)
- Expected shortfall
- Stress testing and scenario analysis
- Option valuation
- Fixed income valuation
- Country and sovereign risk models and management
- External and internal credit ratings
- Expected and unexpected losses
- Operational risk

Readings for Valuation and Risk Models

   - Chapter 2. Quantifying Volatility in VaR Models
   - Chapter 3. Putting VaR to Work


   - Chapter 14. Stress Testing


   - Chapter 13. Binomial Trees
   - Chapter 15. The Black-Scholes-Merton Model
   - Chapter 19. Greek Letters

   - Chapter 1. Prices, Discount Factors, and Arbitrage
   - Chapter 2. Spot, Forward and Par Rates
   - Chapter 3. Returns, Spreads and Yields
   - Chapter 4. One-Factor Risk Metrics and Hedges
   - Chapter 5. Multi-Factor Risk Metrics and Hedges
   - Chapter 3. Assessing Country Risk
   - Chapter 4. Country Risk Assessment in Practice

   - Chapter 2. External and Internal Ratings

   - Chapter 5. Capital Structure in Banks (Pages 170-186 only)

   - Chapter 20. Operational Risk
FRM EXAM PART II

TOPICS

AND

READINGS
MARKET RISK MEASUREMENT AND MANAGEMENT—PART II EXAM WEIGHT • 25%

- VaR and other risk measures
  - Parametric and non-parametric methods of estimation
  - VaR mapping
  - Backtesting VaR
  - Expected shortfall (ES) and other coherent risk measures
  - Extreme value theory (EVT)
- Modeling dependence: Correlations and copulas
- Term structure models of interest rates
- Discount rate selection
- Volatility: Smiles and term structures

Readings for Market Risk Measurement and Management

   - Chapter 4. Non-parametric Approaches
   - Chapter 7. Parametric Approaches (II): Extreme Value

   - Chapter 6. Backtesting VaR
   - Chapter 11. VaR Mapping


   - Chapter 1. Some Correlation Basics: Properties, Motivation, Terminology
   - Chapter 2. Empirical Properties of Correlation: How Do Correlations Behave in the Real World?
   - Chapter 3. Statistical Correlation Models—Can We Apply Them to Finance?
   - Chapter 4. Financial Correlation Modeling—Bottom-Up Approaches (Sections 4.3.0 (intro), 4.3.1, and 4.3.2 only)

   - Chapter 6. Empirical Approaches to Risk Metrics and Hedges
   - Chapter 7. The Science of Term Structure Models
   - Chapter 8. The Evolution of Short Rates and the Shape of the Term Structure
   - Chapter 9. The Art of Term Structure Models: Drift
   - Chapter 10. The Art of Term Structure Models: Volatility and Distribution

   - Chapter 9. OIS Discounting, Credit Issues, and Funding Costs
   - Chapter 20. Volatility Smiles
CREDIT RISK MEASUREMENT AND MANAGEMENT—PART II EXAM WEIGHT • 25%

- Credit analysis
- Default risk: Quantitative methodologies
- Expected and unexpected loss
- Credit VaR
- Counterparty risk
- Credit derivatives
- Structured finance and securitization

Readings for Credit Risk Measurement and Management

   - Chapter 1. The Credit Decision
   - Chapter 2. The Credit Analyst

43. Arnaud de Servigny and Olivier Renault, *Measuring and Managing Credit Risk*.
   - Chapter 3. Default Risk: Quantitative Methodologies

   - Chapter 18. Credit Risks and Credit Derivatives

   - Chapter 6. Credit and Counterparty Risk
   - Chapter 7. Spread Risk and Default Intensity Models
   - Chapter 8. Portfolio Credit Risk (Sections 8.1, 8.2, 8.3 only)
   - Chapter 9. Structured Credit Risk

   - Chapter 3. Defining Counterparty Credit Risk
   - Chapter 4. Netting, Compression, Resets, and Termination Features
   - Chapter 5. Collateral
   - Chapter 8. Credit Exposure
   - Chapter 10. Default Probability, Credit Spreads, and Credit Derivatives
   - Chapter 12. Credit Value Adjustment
   - Chapter 15. Wrong-way risk
   • Chapter 12. Credit Derivatives and Credit-Linked Notes
   • Chapter 13. The Structuring Process
   • Chapter 16. Securitization
   • Chapter 17. Cash Collateralized Debt Obligations

48. Adam Ashcraft and Til Schuermann, “Understanding the Securitization of Subprime Mortgage Credit,” Federal Reserve Bank of New York Staff Reports, No. 318 (March 2008).*
OPERATIONAL AND INTEGRATED RISK MANAGEMENT—PART II EXAM WEIGHT • 25%

- Principles for sound operational risk management
- Enterprise Risk Management (ERM)
- Modeling operational loss distributions
- Liquidity risk (including repurchase agreements and funding risks)
- Model risk
- Risk appetite frameworks
- Risk-adjusted return on capital (RAROC)
- Economic capital frameworks and capital allocation
- Stress testing banks
- Evaluating the performance of risk management systems
- Failure mechanics of dealer banks
- Regulation and the Basel Accords

Readings for Operational Risk Measurement and Management


   - Chapter 7. Internal Loss Data
   - Chapter 8. External Loss Data
   - Chapter 12. Capital Modeling

   - Paragraphs 1-42. Introduction
   - Paragraphs 160-261. Modelling

   - Chapter 14. Estimating Liquidity Risks
   - Chapter 16. Model Risk

   - Chapter 11. Assessing the Quality of Risk Measures (Section 11.1)
   - Chapter 12. Liquidity and Leverage
   - Chapter 12. Repurchase Agreements and Financing


   - Chapter 14. Capital Allocation and Performance Measurement


   - Chapter 12. Basel I, Basel II and Solvency II
   - Chapter 13. Basel 2.5, Basel III, and Dodd-Frank

**Optional Regulatory Readings for Reference**
Candidates are expected to understand the objective and general structure of important international regulatory frameworks and general application of the various approaches for calculating minimum capital requirements, as described in the readings above. Candidates interested in the complete regulatory framework can review the following:


RISK MANAGEMENT AND INVESTMENT MANAGEMENT—PART II EXAM WEIGHT • 15%

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

Readings for Risk Management and Investment Management

   • Chapter 14. Portfolio Construction

   • Chapter 7. Portfolio Risk: Analytical Methods
   • Chapter 17. VaR and Risk Budgeting in Investment Management

   • Chapter 17. Risk Monitoring and Performance Measurement

    • Chapter 24. Portfolio Performance Evaluation

    • Chapter 13. Illiquid Assets (Excluding Section 13.5—Portfolio Choice with Illiquid Assets)

    • Chapter 17. Hedge Funds, by William Fung and David Hsieh

    • Chapter 11. Performing Due Diligence on Specific Managers and Funds
CURRENT ISSUES IN FINANCIAL MARKETS—PART II EXAM WEIGHT • 10%

- Role of clearinghouses in limiting systemic risk
- Evolution of high frequency trading (HFT)
- Risk management in an HFT environment
- Current environment for derivatives trading
- Funding value adjustments
- Cyber security

Readings for Current Issues in Financial Markets


2015 FRM Committee Members

Dr. René Stulz (Chairman) ...........................................Ohio State University

Richard Apostolik ..................................................Global Association of Risk Professionals

Richard Brandt ........................................................Citibank

Dr. Christopher Donohue ..........................................Global Association of Risk Professionals

Hervé Geny ..............................................................London Stock Exchange

Keith Isaac, FRM ....................................................TD Bank

Steve Lerit, CFA .....................................................UBS Wealth Management

William May ............................................................Global Association of Risk Professionals

Michelle McCarthy ..................................................Nuveen Investments

Dr. Victor Ng .............................................................Goldman Sachs & Co

Dr. Elliot Noma .......................................................Garrett Asset Management

Dr. Matthew Pritsker .............................................Federal Reserve Bank of Boston

Dr. Samantha Roberts, FRM ........................................Capital One

Liu Ruixia ..........................................................Industrial and Commercial Bank of China

Dr. Til Schuermann ................................................Oliver Wyman

Nick Strange .........................................................Bank of England, Prudential Regulation Authority

Serge Sverdlov ..................................................Redmond Analytics

Alan Weindorf ........................................................Visa
About GARP | The Global Association of Risk Professionals (GARP) is a not-for-profit global membership organization dedicated to preparing professionals and organizations to make better informed risk decisions. Membership represents over 150,000 Members and Affiliates from banks, investment management firms, government agencies, academic institutions, and corporations from more than 195 countries and territories. GARP administers the Financial Risk Manager (FRM®) and the Energy Risk Professional (ERP®) Exams; certifications recognized by risk professionals worldwide. GARP also helps advance the role of risk management via comprehensive professional education and training for professionals of all levels. www.garp.org.