FRM Examination Study Guide

The designation recognized by risk management professionals worldwide
Topic Outline, Readings, Test Weightings
The Study Guide sets forth primary topics and subtopics covered in the FRM Exam. 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 FRM Exam is kept timely and relevant.

The Study Guide also contains a full listing of all of the readings that are recommended as preparation for the FRM Examination. 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 Exam is a practice-oriented examination. Its 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 FRM Examination is also a comprehensive examination, testing a risk professional on a number of risk management concepts and approaches.

Readings
Questions for the FRM Examination 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 exam. It is strongly suggested that candidates review these readings in depth prior to sitting for the 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 Prep Providers (EPPs). A list of EPPs that have registered with GARP can be found at the GARP website. GARP does not endorse any Exam Prep 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 PART I—TOPICS AND READINGS

FOUNDATIONS OF RISK MANAGEMENT—Part I Exam Weight | 20%

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

Readings for Foundations of Risk Management


   - Chapter 13............................The Standard Capital Asset Pricing Model

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

   - Chapter 4, Section 4.2 only .............................Applying the CAPM to Performance Measurement: Single-Index Performance Measurement Indicators


   - Chapter 3 ..............................Information Risk and Data Quality Management

   - Chapter 4 ..............................Financial Disasters


9. GARP Code of Conduct.*
QUANTITATIVE ANALYSIS—Part I Exam Weight  | 20%

- Discrete and continuous probability distributions
- Population and sample statistics
- Statistical inference and hypothesis testing
- Estimating the parameters of distributions
- Graphical representation of statistical relationships
- Linear regression with single and multiple regressors
  - The Ordinary Least Squares (OLS) method
  - Interpreting and using regression coefficients, the t-statistic, and other output
  - Hypothesis testing and confidence intervals
  - Heteroskedasticity and multicollinearity
- Simulation methods
- Estimating correlation and volatility using EWMA and GARCH models
- Volatility term structures

Readings for Quantitative Analysis

   - Chapter 2 .........................Probabilities
   - Chapter 3 .........................Basic Statistics
   - Chapter 4 .........................Distributions
   - Chapter 5 .........................Hypothesis Testing and Confidence Intervals

   - 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 4 .........................Simulation Modeling

   - Chapter 22 .........................Estimating Volatilities and Correlations
FINANCIAL MARKETS AND PRODUCTS—Part I Exam Weight  |  30%

- Mechanics of OTC and exchange markets
- Forwards, futures, swaps and options
  - Mechanics
  - Pricing and factors that affect it
  - Uses in hedging and hedging strategies
  - Delivery options
- Interest rates and measures of interest rate sensitivity
- Derivatives on fixed income securities, interest rates, foreign exchange, futures, commodities, and equities
- Foreign exchange risk
- Corporate bonds
- 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.........................Determiniation of Forward and Futures Prices
   - Chapter 6.........................Interest Rate Futures
   - Chapter 7.........................Swaps
   - Chapter 10.......................Properties of Stock Options
   - Chapter 11.......................Trading Strategies Involving Options

   - Chapter 6.........................Commodity Forwards and Futures
   - Chapter 1: Fundamentals of Commodity Spot and Futures Markets: Instruments, Exchanges and Strategies

   - Chapter 14: Foreign Exchange Risk

   - Chapter 12: Corporate Bonds, by Frank Fabozzi, Steven Mann and Adam Cohen

    - Chapter 6: The Rating Agencies
VALUATION AND RISK MODELS—Part I Exam Weight  |  30%

- Value-at-Risk (VaR)
  - Applied to stock, currencies, and commodities
  - Applied to linear and non-linear derivatives, and securities with embedded options
  - Structured Monte Carlo, stress testing, and scenario analysis
  - Limitations as a risk measure
  - Coherent risk measures
  - Volatility models
- Option valuation
  - Pricing options using binomial trees
  - The Black-Scholes-Merton Model
  - The “Greeks”
- Fixed income valuation
  - Discount factors, spot rates, forward rates, and yield to maturity
  - Arbitrage and the Law of One Price
  - One-factor measures of price sensitivity
  - Key rate exposures and multi-factor measures of price sensitivity
  - Hedging and immunization
- Country and sovereign risk models and management
- External and internal credit ratings
- Expected and unexpected losses
- Operational risk
- Stress testing and scenario analysis

Readings for Valuation and Risk Models

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

  - Chapter 12.............................Binomial Trees
  - Chapter 14.............................The Black-Scholes-Merton Model
  - Chapter 18.............................The 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 6.............................Empirical Approaches to Risk Metrics and Hedges
   - Chapter 3. Assessing Country Risk
   - Chapter 4. Country Risk Assessment in Practice

   - Chapter 2. External and Internal Ratings

   - Chapter 4. Loan Portfolios and Expected Loss
   - Chapter 5. Unexpected Loss


   - Chapter 18. Operational Risk

   - Chapter 14. Stress Testing

FRM 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
  - Modeling dependence: correlations and copulas
  - Extreme value theory (EVT)
- Term structure models of interest rates
- Volatility: smiles and term structures
- Discount rate selection
- Exotic options
- Mortgages and mortgage-backed securities (MBS)
  - Structure, markets, and valuation

Readings for Market Risk Measurement and Management

  - Chapter 3.........................Estimating Market Risk Measures
  - Chapter 4.........................Non-parametric Approaches
  - Chapter 5.........................Appendix—Modeling Dependence: Correlations and Copulas
  - Chapter 7.........................Parametric Approaches (II): Extreme Value

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


   - 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 19: Volatility Smiles
   - Chapter 25: Exotic Options

   - Chapter 8: Basics of Residential Mortgage Backed Securities

   - Chapter 1: Overview of Mortgages and the Consumer Mortgage Market
   - Chapter 2: Overview of the Mortgage-Backed Securities Market
   - Chapter 10: Techniques for Valuing MBS
CREDIT RISK MEASUREMENT AND MANAGEMENT—Part II Exam Weight | 25%

- Credit analysis
- Default risk: Quantitative methodologies and risk neutral valuations
- Expected and unexpected losses
- Credit VaR
- Counterparty risk
  - Mitigation techniques
  - Credit exposure profiles
  - Collateralization and netting effects
  - Pricing credit value adjustments (CVA)
- Credit derivatives
  - Mechanics and structure
  - Valuation and spreads
- Structured finance and securitization
  - The structuring and securitization process
  - Agency problems and moral hazard
  - Subprime mortgages and securitization

Readings for Credit Risk Measurement and Management

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

42. de Servigny and 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
   - 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

47. Adam Ashcraft and Til Schuemann, “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%

- Calculating and applying risk-adjusted return on capital (RAROC)
- Liquidity risk
- Model risk
  - Model validation
- Evaluating the performance of risk management systems
- Validating VaR models
- Enterprise Risk Management (ERM)
- Economic capital
- Operational loss data
  - Frequency and severity distributions
  - Modeling and fitting distributions
- Failure mechanics of dealer banks
- Risk appetite frameworks
- Data aggregation and risk reporting
- Regulation and the Basel Accords
  - Minimum capital requirements
  - Methods for calculating credit, market, and operational risk
  - Liquidity risk management
  - Stress testing
  - Revisions to the Basel II Accord
  - The Basel III framework
  - Comparing Basel II/III to Solvency II

Readings for Operational Risk Measurement and Management


  - Chapter 14.................................Capital Allocation and Performance Measurement

   • Chapter 14 Estimating Liquidity Risks
   • Chapter 16 Model Risk

   • Chapter 11 Assessing the Quality of Risk Measures
   • Chapter 12 Liquidity and Leverage


**Readings for Regulatory 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.


64. “Operational Risk—Supervisory Guidelines for the Advanced Measurement Approaches,” (Basel Committee on Banking Supervision Publication, June 2011).*

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
  - Hedge fund strategies
  - Due diligence and fraud detection
  - Liquidity
  - Risk management of 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 11.........................Performing Due Diligence on Specific Managers and Funds

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

CURRENT ISSUES IN FINANCIAL MARKETS—Part II Exam Weight  |  10%

- Risk management case studies
- Reference interest rates
- Comparative regulations for OTC derivatives
- Sovereign credit default swaps: roles and regulations
- Capital planning at large banks
- The European credit crisis and transmission of sovereign risks

Readings for Current Issues in Financial Markets


2014 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

Kai Leifert, FRM .............................................................. Northern Trust Global Investments

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

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

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

Adolfo Montoro, FRM ..................................................... Deutsche Bank

Ezra Uzi Moualem, FRM ............................................. The Financial Institute of Israel & ZRisk

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

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

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

Robert Scanlon ............................................................... Scanlon Associates

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

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.