2025

FRM®

STUDY GUIDE

GARP®

FRM® | Financial Risk Manager

CONTENTS

2025 FINANCIAL RISK MANAGER (FRM) EXAM STUDY GUIDE

Topic Outline, Readings, and Test Weightings

The Study Guide sets forth primary topics and sub-topics covered in the FRM Exams Part I and Part II. The topics were selected by the FRM Committee as essential for today's risk managers 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 the readings that are recommended as preparation for the FRM Exams 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 based on both theory, as set forth in the readings, and real-world applications. Candidates are expected to understand risk management concepts and approaches, as well as 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 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 on the GARP website.

FRM Exam Preparation Providers (EPPs)

Some candidates may want to review more formally the materials with FRM EPPs. A list of EPPs that have registered with GARP can be found on the GARP website. GARP does not endorse any EPP, but merely lists them as a service to FRM candidates.

FRM EXAM PART I

FOUNDATIONS OF RISK MANAGEMENT

QUANTITATIVE ANALYSIS

FINANCIAL MARKETS AND PRODUCTS

VALUATION AND RISK MODELS

FOUNDATIONS OF RISK MANAGEMENT

PART I EXAM WEIGHT | 20%

Topics and Readings

This area focuses on foundational concepts of risk management and how risk management can add value to an organization. The broad knowledge points covered in Foundations of Risk Management include the following:

- Basic risk types, measurement, and management tools
- Creating value with risk management
- Risk governance and corporate governance
- Credit risk transfer mechanisms
- The Capital Asset Pricing Model (CAPM)
- Risk-adjusted performance measurement
- Multifactor models
- Data aggregation and risk reporting
- Financial disasters and risk management failures
- Ethics and the GARP Code of Conduct
- Enterprise risk management (ERM)

To cover these broad knowledge points, a proprietary book has been created exclusively for FRM candidates. While detailed learning objectives associated with these readings are presented in the 2025 FRM Learning Objectives document, a brief summary of how to relate these readings to the knowledge points follows.

Chapters 1 and 2 explore different risk types, how risks can arise in an organization, and how firms manage financial risks. Chapter 3 describes the role of corporate governance in risk management, including the role of the board of directors and other areas of an organization. The concept of risk appetite and how it is translated into a risk appetite framework and communicated throughout an organization is presented as well in this chapter.

Chapter 4 presents an overview of credit risk transfer mechanisms, including credit derivatives and securitization, and discusses issues with the securitization of subprime mortgages. Chapter 5 presents Modern Portfolio Theory (MPT) and the CAPM, one of the foundational developments in risk-adjusted pricing and valuation. Chapter 6 explains how the Arbitrage Pricing Theory (APT) and factor models can be used to model returns on investment assets.

Data is the lifeblood of many large financial organizations, and aggregating and reporting risk data have become increasingly important. Chapter 7 addresses this topic. Chapter 8 introduces enterprise risk management (ERM) — a commonly used method for assessing and managing risk in an organizational context — and discusses its future trends.

As it is always important to learn from historical experience, Chapter 9 describes various financial disasters from the past, and Chapter 10 focuses on the financial crisis of 2007-2009.

To help ensure ethical standards are upheld in the risk management profession, Chapter 11 contains GARP's Code of Conduct, which applies to all candidates and those who complete FRM Certification.

Readings for Foundations of Risk Management

All Foundations of Risk Management curated readings are contained in GARP's proprietary Foundations of Risk Management book. The contents of this book are as follows:

- Chapter 1. The Building Blocks of Risk Management
- Chapter 2. How Do Firms Manage Financial Risk?
- Chapter 3. The Governance of Risk Management
- Chapter 4. Credit Risk Transfer Mechanisms
- Chapter 5. Modern Portfolio Theory and Capital Asset Pricing Model
- Chapter 6. The Arbitrage Pricing Theory and Multifactor Models of Risk and Return
- Chapter 7. Principles for Effective Data Aggregation and Risk Reporting
- Chapter 8. Enterprise Risk Management and Future Trends
- Chapter 9. Learning from Financial Disasters
- Chapter 10. Anatomy of the Great Financial Crisis of 2007-2009
- Chapter 11. GARP Code of Conduct*

* This reading is available for free on the GARP website.

QUANTITATIVE ANALYSIS

PART I EXAM WEIGHT | 20%

Topics and Readings

This area focuses on basic probability and statistics, regression and time series analysis, and various quantitative techniques useful in risk management. The broad knowledge points covered in Quantitative Analysis include the following:

- Discrete and continuous probability distributions
- Estimating the parameters of distributions
- Population and sample statistics
- Bayesian analysis
- Statistical inference and hypothesis testing
- Measures of correlation
- Linear regression with single and multiple regressors
- Time series analysis and forecasting
- Simulation methods
- Machine learning

To cover these broad knowledge points, a proprietary book has been created exclusively for FRM candidates. While detailed learning objectives associated with these readings are presented in the 2025 FRM Learning Objectives document, a brief summary of how to relate these readings to the knowledge points follows.

Chapters 1 through 6 introduce fundamental concepts related to probability, statistics, probability distributions, Bayesian analysis, hypothesis testing, and confidence intervals.

Regression analysis is an important statistical tool used to investigate relationships between variables. Chapters 7 and 8 give a general introduction to single and multivariate linear regression analysis. Chapter 9 examines model specification and explores how potential deficiencies in model specification can be identified through conducting standard specification checks, which include the use of residual diagnostics and tests of statistical hypotheses.

Time series data occur frequently in finance. The next two chapters describe methods for analyzing time series data in order to estimate statistics, extract meaningful data characteristics, and produce forecasts of future values. Chapter 10 focuses on modeling stationary time series, while Chapter 11 discusses the modeling of non-stationary time series.

Dependence and variation are important subjects in risk management. Chapter 12 introduces volatility, correlation, and returns, as well as the properties of these three measures in the context of both normally and non-normally distributed variables.

Simulation methods are used to value and analyze complex financial instruments and portfolios. Chapter 13 introduces two closely related simulation methods, Monte Carlo simulation and bootstrapping, and outlines some of their applications. It also explains the advantages and disadvantages of using simulations and the techniques employed to reduce Monte Carlo sampling error.

The last two chapters introduce machine learning as an alternative approach to traditional model-building techniques tackled in the previous chapters and highlight its growing applications in finance. Chapter 14 details the various ways data can be prepared for machine learning applications and distinguishes among the types of machine learning models, while Chapter 15 presents several leading supervised machine learning models used for classification and prediction problems.

Readings for Quantitative Analysis

All Quantitative Analysis readings are contained in GARP's proprietary Quantitative Analysis book. The contents of this book are as follows:

- Chapter 1. Fundamentals of Probability
- Chapter 2. Random Variables
- Chapter 3. Common Univariate Random Variables
- Chapter 4. Multivariate Random Variables
- Chapter 5. Sample Moments
- Chapter 6. Hypothesis Testing
- Chapter 7. Linear Regression
- Chapter 8. Regression with Multiple Explanatory Variables
- Chapter 9. Regression Diagnostics
- Chapter 10. Stationary Time Series
- Chapter 11. Non-Stationary Time Series
- Chapter 12. Measuring Returns, Volatility, and Correlation
- Chapter 13. Simulation and Bootstrapping
- Chapter 14. Machine Learning Methods
- Chapter 15. Machine Learning and Prediction

FINANCIAL MARKETS AND PRODUCTS

PART I EXAM WEIGHT | 30%

Topics and Readings

This area focuses on financial products and the markets in which they trade. The broad knowledge points covered in Financial Markets and Products include the following:

- Structures and functions of financial institutions
- Structure and mechanics of over-the-counter (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 (MBS)

To cover these broad knowledge points, a proprietary book has been created exclusively for FRM candidates. While detailed learning objectives associated with these readings are presented in the 2025 FRM Learning Objectives document, a brief summary of how to relate these readings to the knowledge points follows.

The first chapter describes the structure of commercial and investment banking, the way banks are regulated, the nature of risks they face, the role of capital in providing cushion against losses, and the securitization process for MBS. Chapter 2 explains the risks and regulations faced by insurance companies, their capital requirements, and performance ratios, as well as the types and key characteristics of pension funds. Chapter 3 introduces mutual funds, exchange-traded funds, and hedge funds, and describes various hedge fund strategies and performance measures.

Financial derivatives play a key role in risk management. Chapter 4 describes options, forwards, and futures along with the derivatives markets and the risks faced by market participants. The exchange-traded and OTC markets are explained in Chapter 5. Chapter 6 describes the structures and operations of central counterparties (CCPs), and the types of risks faced by CCPs. Chapters 7 and 8 explain the mechanics of futures markets and how futures are used for hedging. Chapter 9 describes the foreign exchange markets and explains methods for estimating foreign exchange risk, multicurrency hedging strategies using options, the determination of exchange rates, and the covered interest rate parity theorem.

Chapters 10 and 11 provide deeper coverage of financial forwards and futures, including their pricing and the determination of no-arbitrage values for commodity forwards and futures. The following four chapters (12 through 15) examine options and their use in risk management, including the properties of different options, option market mechanics, multi-option and hedging strategies, and different exotic options.

Interest rates and two important classes of fixed income securities are covered in the next three chapters. Chapter 16 describes properties of interest rates and explains bond valuation, duration, and convexity, the pricing of forward rate agreements, and the theories of term structure. Chapter 17 describes corporate bonds, their types and characteristics, and credit ratings. Chapter 18 defines mortgages, explains the valuation of MBS pools, prepayment modeling, and calculations of mortgage pool metrics.

The last two chapters examine two additional derivative instruments. Chapter 19 describes interest rates and Treasury bonds in relation to forward and futures prices, along with the use of interest rate futures in hedging. The mechanics, types, and the pricing of swaps contracts used for hedging are described in Chapter 20.

Readings for Financial Markets and Products

All Financial Markets and Products readings are contained in GARP's proprietary Financial Markets and Products book. The contents of this book are as follows:

- Chapter 1. Banks
- Chapter 2. Insurance Companies and Pension Plans
- Chapter 3. Fund Management
- Chapter 4. Introduction to Derivatives
- Chapter 5. Exchanges and OTC Markets
- Chapter 6. Central Clearing
- Chapter 7. Futures Markets
- Chapter 8. Using Futures for Hedging
- Chapter 9. Foreign Exchange Markets
- Chapter 10. Pricing Financial Forwards and Futures
- Chapter 11. Commodity Forwards and Futures
- Chapter 12. Options Markets
- Chapter 13. Properties of Options
- Chapter 14. Trading Strategies
- Chapter 15. Exotic Options
- Chapter 16. Properties of Interest Rates
- Chapter 17. Corporate Bonds
- Chapter 18. Mortgages and Mortgage-Backed Securities
- Chapter 19. Interest Rate Futures
- Chapter 20. Swaps

VALUATION AND RISK MODELS

PART I EXAM WEIGHT | 30%

Topics and Readings

This area focuses on valuation techniques and risk models. The broad knowledge points covered in Valuation and Risk Models include the following:

- Value-at-risk (VaR)
- Expected shortfall (ES)
- Estimating volatility and correlation
- Economic and regulatory capital
- Stress testing and scenario analysis
- Option valuation
- Fixed-income valuation
- Hedging
- Country and sovereign risk models and management
- External and internal credit ratings
- Expected and unexpected losses
- Operational risk

To cover these broad knowledge points, a proprietary book has been created exclusively for FRM candidates. While detailed learning objectives associated with these readings are presented in the 2025 FRM Learning Objectives document, a brief summary of how to relate these readings to the knowledge points follows.

The first three chapters introduce financial risk measures and models. Chapter 1 examines measures of financial risk and describes measurement frameworks such as the mean-variance approach, VaR, and ES. Chapter 2 covers VaR and ES estimation approaches and applications. Chapter 3 discusses the calculation and monitoring of volatility used in the VaR and ES models.

The next three chapters introduce credit risk. Chapter 4 describes credit ratings and presents a review of external and internal rating methodologies, along with their relative strengths and weaknesses. Chapter 5 explains specific sources of country risk and the use of external ratings in assessing sovereign default risk. Chapter 6 covers the basics of credit risk, specifically expected loss (EL) and unexpected loss (UL), for both individual assets and portfolios, and describes default risk models such as the Gaussian copula model, the Vasicek model, and CreditMetrics.

Chapter 7 introduces aspects of operational risk and discusses various approaches for determining capital for operational risk. Stress testing, its importance, applications, and practices are explained in Chapter 8.

Chapters 9 through 13 focus on risk management for fixed-income securities. Chapters 9 through 11 cover the various tools of fixed-income valuation, while Chapters 12 and 13 explain risk metrics and hedging.

The last three chapters discuss key elements of option pricing and option sensitivities. Chapters 14 and 15 cover option valuation using binomial trees and the Black-Scholes-Merton model. Chapter 16 presents applications of options for hedging and risk management.

Readings for Valuation and Risk Models

All Valuation and Risk Models readings are contained in GARP's proprietary Valuation and Risk Models book. The contents of this book are as follows:

- Chapter 1. Measures of Financial Risk
- Chapter 2. Calculating and Applying VaR
- Chapter 3. Measuring and Monitoring Volatility
- Chapter 4. External and Internal Credit Ratings
- Chapter 5. Country Risk: Determinants, Measures, and Implications
- Chapter 6. Measuring Credit Risk
- Chapter 7. Operational Risk
- Chapter 8. Stress Testing
- Chapter 9. Pricing Conventions, Discounting, and Arbitrage
- Chapter 10. Interest Rates
- Chapter 11. Bond Yields and Return Calculations
- Chapter 12. Applying Duration, Convexity, and DV01
- Chapter 13. Modeling Non-Parallel Term Structure Shifts and Hedging
- Chapter 14. Binomial Trees
- Chapter 15. The Black-Scholes-Merton Model
- Chapter 16. Option Sensitivity Measures: The "Greeks"

FRM EXAM PART II

MARKET RISK MEASUREMENT AND MANAGEMENT

CREDIT RISK MEASUREMENT AND MANAGEMENT

OPERATIONAL RISK AND RESILIENCE

LIQUIDITY AND TREASURY RISK MEASUREMENT AND MANAGEMENT

RISK MANAGEMENT AND INVESTMENT MANAGEMENT

CURRENT ISSUES IN FINANCIAL MARKETS

MARKET RISK MEASUREMENT AND MANAGEMENT

PART II EXAM WEIGHT | 20%

Topics and Readings

This area focuses on market risk measurement and management techniques. The broad knowledge points covered in Market Risk Measurement and Management include the following:

- 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
- Volatility: smiles and term structures
- Fundamental Review of the Trading Book (FRTB)

To cover these broad knowledge points, we've shared a set of curated readings. While detailed learning objectives associated with these readings are presented in the 2025 FRM Learning Objectives document, a brief summary of how to relate these readings to the knowledge points follows.

The importance of VaR and other common risk measures in assessing risk cannot be overstated. Reading 1 presents both parametric and non-parametric estimation techniques for VaR and ES. Backtesting as a form of model validation, and the use of VaR and VaR mapping as a tool to address portfolio risk factors, is presented in the two chapters of Reading 2. Reading 3 returns to the validation of VaR models, moving beyond backtesting to discuss other aspects of validation such as benchmarking and assessments of conceptual soundness. It also explores tests of the entire distribution of modeled outcomes and how they compare to traditional backtests based on VaR exceedances.

Modern risk management requires an understanding of correlation risk. Reading 4 explains the basics of correlation risk and explores the empirical properties, models, and modeling approaches related to correlation risk. The first chapter covers the basics of correlation risk and how it is related to credit risk, market risk, systemic risk, and concentration risk. The second chapter explores how correlations behave in different economic states as well as mean reversion and autocorrelation. The third chapter explains the purpose and uses of copula functions.

The six chapters in Reading 5 and Reading 6 are all associated with term structure models and their impact on pricing and hedging fixed-income products and interest rate derivatives. Various regression hedges are explained in the first chapter. Term structure models that deal with drifts, mean reversions, negative short-term rates, and time-dependent volatilities are all reviewed in subsequent chapters. The last of these chapters compares the popular Vasicek and Gauss+ models.

Reading 7 covers very specific concepts related to the shapes of volatility smiles.

A discussion on the Fundamental Review of the Trading Book capital requirements is covered in Reading 8.

Readings for Market Risk Measurement and Management

1. **Kevin Dowd, *Measuring Market Risk, 2nd Edition* (West Sussex, UK: John Wiley & Sons, 2005).**
   - Chapter 3. Estimating Market Risk Measures: An Introduction and Overview
   - Chapter 4. Non-Parametric Approaches
   - Chapter 7: Parametric Approaches (II): Extreme Value

2. **Philippe Jorion, *Value at Risk: The New Benchmark for Managing Financial Risk, 3rd Edition* (New York, NY: McGraw-Hill, 2007).**
   - Chapter 6. Backtesting VaR
   - Chapter 11. VaR Mapping

3. **David Lynch, Iftekhar Hasan, and Akhtar Siddique (eds.), Validation of Risk Management Models for Financial Institutions (Cambridge University Press, 2023).**
   - Chapter 2. Validating Bank Holding Companies' Value-at-Risk Models for Market Risk, David Lynch
   - Chapter 4. Beyond Exceedance-Based Backtesting of Value-at-Risk Models: Methods for Backtesting the Entire Forecasting Distribution Using Probability Integral Transform, Diana Iercosan, Alysa Shcherbakova, David McArthur and Rebecca Alper

4. **Gunter Meissner, *Correlation Risk Modeling and Management, 2nd Edition* (Risk Books, 2019).**
   - Chapter 1. Correlation Basics: Definitions, Applications, and Terminology
   - Chapter 2. Empirical Properties of Correlation: How Do Correlations Behave in the Real World?
   - Chapter 5. "Financial Correlation Modeling — Bottom-Up Approaches (pages 126-134 only)

5. **Bruce Tuckman and Angel Serrat, *Fixed Income Securities: Tools for Today's Markets, 4th Edition* (Hoboken, NJ: John Wiley & Sons, 2022).**
   - Chapter 6. Regression Hedging and Principal Component Analysis
   - Chapter 7. Arbitrage Pricing with Term Structure Models
   - Chapter 8. Expectations, Risk Premium, Convexity, and the Shape of the Term Structure
   - Chapter 9. The Vasicek and Gauss+ Models

6. **Bruce Tuckman and Angel Serrat, *Fixed Income Securities: Tools for Today's Markets, 3rd Edition* (Hoboken, NJ: John Wiley & Sons, 2011).**
   - Chapter 9. The Art of Term Structure Models: Drift
   - Chapter 10. The Art of Term Structure Models: Volatility and Distribution

7. **John C. Hull, *Options, Futures, and Other Derivatives, 11th Edition* (New York, NY: Pearson, 2022).**
   - Chapter 20. Volatility Smiles

8. **John C. Hull, Risk *Management and Financial Institutions, 6th Edition* (Hoboken, NJ: John Wiley & Sons, 2023).**
   - Chapter 18. Fundamental Review of the Trading Book

CREDIT RISK MEASUREMENT AND MANAGEMENT

PART II EXAM WEIGHT | 20%

Topics and Readings

This area focuses on a candidate's understanding of credit risk management, with some attention given to structured finance and credit products such as collateralized debt obligations and credit derivatives. The broad areas of knowledge covered in readings related to Credit Risk Measurement and Management include the following:

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

To cover these broad knowledge points, we've shared a set of curated readings. While detailed learning objectives associated with these readings are presented in the 2025 FRM Learning Objectives document, a brief summary of how to relate these readings to the knowledge points follows.

Reading 1 includes two chapters that introduce the key themes of credit risk management. The first chapter discusses the components of credit risk, types of credit risk analysis, and credit risk measurements. The second chapter describes governance and explains the responsibilities of risk management in an organization. Reading 2 describes the tools and methods of credit analysis. It explains the components of credit risk management capability and discusses elements of an effective lending or financing policy.

Reading 3 covers measurement of credit risk, especially expected loss and unexpected loss, and the effect of correlation on portfolio unexpected loss. It describes a framework for calculating economic capital for credit risk and explores the challenges of quantifying credit risk.

The next three readings discuss key features of a good rating system and the relationship between ratings and the probability of default. Reading 4 includes two chapters, with the first chapter descriibing different approaches to credit risk modeling and assessment, including the judgmental approaches, empirical models, and financial models to predict default. The second chapter presents the role of ratings in supporting credit risk management and rating assignment methodologies. Reading 5 defines and compares risk management and scoring models of retail and corporate credit risk. Reading 6 describes measures of sovereign default risk and explains components of a sovereign rating.

Quantitative methodologies of estimating credit risk are covered in two chapters of Reading 7. The first chapter describes default intensity models, explains credit spread risk, and defines the relationship between a default probability and a hazard rate. The second chapter introduces credit value at risk and the tools for measuring it.

Reading 8 includes two chapters that provide a deeper coverage of portfolio and structured credit risk. The first chapter defines default correlation for credit portfolios, assesses the impact of correlation on credit VaR, and describes the use of the single factor model to measure portfolio credit risk. The second chapter describes common types of structured products and the mechanics of securitization and explains how default sensitivities for tranches are measured.

Reading 9 extends discussions on quantitative methodologies of estimating credit risk and explains the distinction between reduced form and structural default correlation models. Assessment of credit derivatives is covered, and the various credit risk mitigants and their role in credit analysis are examined.

Counterparty risk is discussed in seven chapters that form Reading 10. The first chapter introduces derivatives and explains how derivative transactions create counterparty credit risk. The next four chapters identify ways of managing and mitigating counterparty risk and describe the effects of netting, close-out, collateral on credit exposure, and central clearing. The sixth chapter describes the determination of credit exposure, the pricing of exposure profiles for derivative contracts, and the impact of collateral on funding, while the last chapter covers the analysis of credit value adjustment (CVA) and debt value adjustment (DVA), and the concept of wrong-way risk.

Reading 11 describes stress tests on CVA and counterparty credit risk (CCR).

Finally, Reading 12 describes special purpose vehicles (SPVs), explains performance analysis tools for securitized structures, and describes the various prepayment forecasting methodologies.

Readings for Credit Risk Measurement and Management

1. **Sylvain Bouteille and Diane Coogan-Pushner, *The Handbook of Credit Risk Management: Originating, Assessing, and Managing Credit Exposures, 2nd Edition* (Hoboken, NJ: John Wiley & Sons, 2022).**
    - Chapter 1. Fundamentals of Credit Risk
    - Chapter 2. Governance

2. **Hennie van Greuning and Sonja Brajovic Bratanovic, *Analyzing Banking Risk, Fourth Edition* (World Bank Group, 2020).**
    - Chapter 7. Credit Risk Management

3. **Gerhard Schroeck, *Risk Management and Value Creation in Financial Institutions* (New York, NY: John Wiley & Sons, 2002).**
    - Chapter 5. Capital Structure in Banks (pages 170-186 only)

4. **Michalis Doumpos, Christos Lemonakis, Dimitrios Niklis, and Constantin Zopounidis, *Analytical Techniques in the Assessment of Credit Risk: An Overview of Methodologies and Applications* (Springer, 2019).**
    - Chapter 1. Introduction to Credit Risk Modeling and Assessment
    - Chapter 2. Credit Scoring and Rating

5. **Michel Crouhy, Dan Galai and Robert Mark, *The Essentials of Risk Management, 2nd Edition* (New York, NY: McGraw-Hill, 2014).**
    - Chapter 9. Credit Scoring and Retail Credit Risk Management

6. **Aswath Damodaran, *Country Risk: Determinants, Measures, and Implications – The 2022 Edition* (2022)**

7. **John C. Hull, *Risk Management and Financial Institutions, Sixth Edition* (John Wiley & Sons, 2023).**
   - Chapter 17. Estimating Default Probabilities
   - Chapter 19. Credit Value at Risk

8. **Allan Malz, *Financial Risk Management: Models, History, and Institutions* (Hoboken, NJ: John Wiley & Sons, 2011).**
   - Chapter 8. Portfolio Credit Risk (Sections 8.1, 8.2, 8.3 only)
   - Chapter 9. Structured Credit Risk

9. **John C. Hull, *Options, Futures, and Other Derivatives, 11th Edition* (Pearson, 2022).**
   - Chapter 24. Credit Risk
   - Chapter 25. Credit Derivatives

10. **Jon Gregory, *The xVA Challenge: Counterparty Credit Risk, Funding, Collateral, and Capital* (West Sussex, UK: John Wiley & Sons, 2020).**
    - Chapter 2. Derivatives
    - Chapter 3. Counterparty Risk and Beyond
    - Chapter 6. Netting, Close-out and Related Aspects
    - Chapter 7. Margin (Collateral) and Settlement
    - Chapter 8. Central Clearing
    - Chapter 11. Future Value and Exposure
    - Chapter 17. CVA

11. ***Stress Testing: Approaches, Methods, and Applications*, edited by Akhtar Siddique and Iftekhar Hasan (London, UK: Risk Books, 2013).**
    - Chapter 4. The Evolution of Stress Testing Counterparty Exposures

12. **Moorad Choudhry, *Structured Credit Products: Credit Derivatives & Synthetic Securitisation, 2nd Edition* (New York, NY: John Wiley & Sons, 2010).**
    - Chapter 12. An Introduction to Securitisation

OPERATIONAL RISK AND RESILIENCE

PART II EXAM WEIGHT | 20%

Topics and Readings

This area focuses on methods to measure and manage operational risk as well as methods to manage risk across an organization, including risk governance, stress testing, and regulatory compliance. The broad knowledge points covered in Operational Risk and Resilience include the following:

- Governance of operational risk management frameworks
- Identification, classification, and reporting of operational risks
- Measurement and assessment of operational risks
- Mitigation of operational risks
- Cyber-resilience and operational resilience
- Risks related to money laundering, financing of terrorism, financial crime, and fraud
- Third-party outsourcing risk
- Model risk and model validation
- Stress testing banks
- Risk-adjusted return on capital (RAROC)
- Economic capital frameworks and capital planning
- Regulation and the Basel Accords

To cover these broad knowledge points, we've shared a set of proprietary and curated readings. While detailed learning objectives associated with these readings are presented in the 2025 FRM Learning Objectives, a brief summary of how to relate these readings to the knowledge points follows.

This area is divided into two sections. The first section, Reading 1, provides a proprietary holistic overview of operational risk and resilience. Chapter 1 introduces operational risk management frameworks and operational resilience, while Chapter 2 goes deeper into the governance of a framework. Chapter 3 describes different approaches for the identification and classification of operational risks, while Chapter 4 explains approaches and metrics firms can use to measure and assess operational risk and establish a strong level of operational resilience. Chapter 5 presents methods firms can use to mitigate operational risk, including a discussion of risk control frameworks. To round out this section, Chapter 6 describes best practices and challenges in risk reporting and Chapter 7 addresses some integrated risk management topics with an emphasis on stress testing.

The second section presents a series of focus areas to explore best practices more deeply in managing some key types of operational risk. In some of these focus areas, the discussion is complemented by case studies describing historical events and valuable lessons that risk managers can learn in managing each type of risk. Readings 2 and 3 focus on cyber risk management and current practices in cyber-resilience, while Readings 4 and 5 provide insights into managing financial crime and fraud risk. In the next focus area, Readings 6 and 7 present best practices in managing risk related to third-party vendors and case studies on investor protection and compliance risks. Readings 8 and 9 follow with a discussion of model risk. Important concepts presented in this area include best practices for identifying and mitigating model risk as well as model validation.

The next focus area covers stress testing and capital planning. Reading 10 continues the discussion of stress testing by comparing different stress testing approaches. Reading 11 introduces capital planning and RAROC, while readings 12 and 13 extend the discussion by presenting best practices in capital planning and recommended practices for stress testing at larger banks. Finally, readings 14 through 17 provide a detailed overview of the Basel regulations including their historical evolution and more recent recommendations. For the interested candidate, the full Basel regulation documents are presented as optional readings.

Readings for Operational Risk and Resilience

1. **Global Association of Risk Professionals, *Operational Risk and Resilience* (New York, NY: Pearson, 2022).**
    - Chapter 1. Introduction to Operational Risk and Resilience
    - Chapter 2. Risk Governance
    - Chapter 3. Risk Identification
    - Chapter 4. Risk Measurement and Assessment
    - Chapter 5. Risk Mitigation
    - Chapter 6. Risk Reporting
    - Chapter 7. Integrated Risk Management

2. **"Cyber-resilience: Range of practices," Basel Committee on Banking Supervision Publication, December 2018.**

3. **Global Association of Risk Professionals, *Operational Risk and Resilience* (New York, NY: Pearson, 2022).**
    - Chapter 9. Case Study: Cyberthreats and Information Security Risks

4. **"Sound Management of Risks related to Money Laundering and Financing of Terrorism," Basel Committee on Banking Supervision, revised July 2020. (through p.16, para. 83)**

5. **Global Association of Risk Professionals, *Operational Risk and Resilience* (New York, NY: Pearson, 2022).**
    - Chapter 11. Case Study: Financial Crime and Fraud

6. **"Guidance on Managing Outsourcing Risk," Board of Governors of the Federal Reserve System, December 2013.**

7. **Global Association of Risk Professionals, *Operational Risk and Resilience* (New York, NY: Pearson, 2022).**
    - Chapter 13. Case Study: Third-party Risk Management
    - Chapter 14. Case Study: Investor Protection and Compliance Risks in Investment Activities

8. **"Supervisory Guidance on Model Risk Management," Federal Deposit Insurance Corporation, June 7, 2017.**

9. **Global Association of Risk Professionals, *Operational Risk and Resilience* (New York, NY: Pearson, 2022).**
    - Chapter 16. Case Study: Model Risk and Model Validation

10. **Til Schuermann, (2014), "Stress Testing Banks," International Journal of Forecasting, 30:3, 717–728..**

11. **Michel Crouhy, Dan Galai and Robert Mark, *The Essentials of Risk Management, 2nd Edition* (New York, NY: McGraw-Hill, 2014).**
    - Chapter 17. Risk Capital Attribution and Risk-Adjusted Performance Measurement

12. **"Range of practices and issues in economic capital frameworks," Basel Committee on Banking Supervision Publication, March 2009.**

13. **"Capital Planning at Large Bank Holding Companies: Supervisory Expectations and Range of Current Practice," Board of Governors of the Federal Reserve System, August 2013.**

14. **Mark Carey, "Capital Regulation Before the Global Financial Crisis," GARP Risk Institute, April 2019.**

15. **Mark Carey, "Solvency, Liquidity and Other Regulation After the Global Financial Crisis," GARP Risk Institute, April 2019.**

16. **"High-level summary of Basel III reforms," Basel Committee on Banking Supervision Publication, December 2017.**

17. **"Basel III: Finalising post-crisis reforms," Basel Committee on Banking Supervision Publication, December 2017, pp. 128-136**

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:

"Revisions to the Principles for the Sound Management of Operational Risk," Basel Committee on Banking Supervision Publication, March 2021.

"Principles for Operational Resilience," Basel Committee on Banking Supervision Publication, March 2021.

"Basel II: International Convergence of Capital Measurement and Capital Standards: A Revised Framework - Comprehensive Version," Basel Committee on Banking Supervision Publication, June 2006.*

"Basel III: A global regulatory framework for more resilient banks and banking systems—revised version," Basel Committee on Banking Supervision Publication, June 2011.*

"Basel III: The Liquidity Coverage Ratio and liquidity risk monitoring tools," Basel Committee on Banking Supervision Publication, January 2013.*

"Revisions to the Basel II market risk framework—updated as of 31 December 2010," Basel Committee on Banking Supervision Publication, February 2011.*

"Basel III: The net stable funding ratio." Basel Committee on Banking Supervision Publication, October 2014.*

"Minimum capital requirements for market risk," Basel Committee on Banking Supervision Publication, January 2016.*

"Basel III: Finalising post-crisis reforms," Basel Committee on Banking Supervision Publication, December 2017.*

* This reading is available for free on the GARP website.

LIQUIDITY AND TREASURY RISK MEASUREMENT AND MANAGEMENT

PART II EXAM WEIGHT | 15%

Topics and Readings

This area focuses on methods to measure and manage liquidity and treasury risk. The broad knowledge points covered in the Liquidity and Treasury Risk Measurement and Management section include the following:

- Liquidity risk principles and metrics
- Managing liquidity needs and monitoring liquidity positions
- Cash flow modeling, liquidity stress testing, and reporting
- Contingency funding plan
- Funding models
- Funds transfer pricing
- Cross-currency funding
- Balance sheet management
- Asset liquidityy

To cover these broad knowledge points, we've shared a set of curated readings. While detailed learning objectives associated with these readings are presented in the 2025 FRM Learning Objectives, a brief summary of how to relate these readings to the knowledge points follows.

Readings 1, 2, and 3 discuss potential sources of liquidity risk, quantitative liquidity metrics, and institutional liquidity risk management methods. Readings 5, 6, 8, 9, and 10 take this discussion further and present the major components of a holistic liquidity risk management framework, including the development and monitoring of internal liquidity metrics, cash flow modeling, liquidity stress testing, contingency funding planning, managing intraday liquidity, and liquidity risk reporting. Reading 7 addresses liquidity from a dealer bank perspective by explaining potential warning signs that a bank could be failing, potential systemic liquidity risks, and possible policy responses to address these scenarios.

Readings 4, 11, and 16 provide more detail on day-to-day techniques that banks use to manage liquidity and treasury risk, including asset-liability management, liquidity portfolio management, determining funding sources to address liquidity mismatches, and managing deposit accounts and liabilities. Reading 12 explains the market for repurchase agreements.

Transfer pricing, a more technical aspect of liquidity and treasury risk management, is covered in Reading 13, while Readings 14 and 15 provide an international perspective to liquidity risk management by presenting topics such as cross-currency funding and violations of covered interest rate parity.

Finally, Reading 17 addresses liquidity risk from the perspective of an asset manager by providing insights on how to measure and manage the risks of illiquid assets.

Readings for Liquidity and Treasury Risk Measurement and Management

1. **John C. Hull, *Risk Management and Financial Institutions, 5th Edition* (Hoboken, NJ: John Wiley & Sons, 2018).**
   - Chapter 24. Liquidity Risk

2. **Allan Malz, *Financial Risk Management: Models, History, and Institutions* (Hoboken, NJ: John Wiley & Sons, 2011).**
   - Chapter 12. Liquidity and Leverage

3. **Shyam Venkat, Stephen Baird, *Liquidity Risk Management: A Practitioner's Perspective* (Hoboken, NJ: John Wiley & Sons, 2016).**
   - Chapter 6. Early Warning Indicators

4. **Peter Rose, Sylvia Hudgins, *Bank Management & Financial Services, 9th Edition* (New York, NY: McGraw-Hill, 2013).**
   - Chapter 10. The Investment Function in Financial-Services Management
   - Chapter 11. Liquidity and Reserves Management: Strategies and Policies

5. **Shyam Venkat, Stephen Baird, *Liquidity Risk Management* (Hoboken, NJ: John Wiley & Sons, 2016).**
   - Chapter 4. Intraday Liquidity Risk Management

6. **Antonio Castagna, Francesco Fede, *Measuring and Managing Liquidity Risk* (United Kingdom: John Wiley & Sons, 2013).**
   - Chapter 6. Monitoring Liquidity

7. **Darrell Duffie, (2010), "The Failure Mechanics of Dealer Banks," Journal of Economic Perspectives, 24:1, 51-72.**

8. **Shyam Venkat, Stephen Baird, *Liquidity Risk Management* (Hoboken, NJ: John Wiley & Sons, 2016).**
   - Chapter 3. Liquidity Stress Testing

9. **Moorad Choudhry, *The Principles of Banking* (Singapore: John Wiley & Sons, 2012).**
   - Chapter 14. Liquidity Risk Reporting and Stress Testing

10. **Shyam Venkat, Stephen Baird, *Liquidity Risk Management* (Hoboken, NJ: John Wiley & Sons, 2016).**
    - Chapter 7. Contingency Funding Planning

11. **Peter Rose, Sylvia Hudgins, *Bank Management & Financial Services, 9th Edition* (New York, NY: McGraw-Hill, 2013).**
    - Chapter 12. Managing and Pricing Deposit Services
    - Chapter 13. Managing Nondeposit Liabilities

12. **Bruce Tuckman and Angel Serrat, *Fixed Income Securities: Tools for Today's Markets, 3rd Edition* (Hoboken, NJ: John Wiley & Sons, 2011).**
    - Chapter 12. Repurchase Agreements and Financing

13. **Joel Grant, (2011), "Liquidity Transfer Pricing: A Guide to Better Practice," Occasional Paper, Financial Stability Board, Bank for International Settlements.**

14. **Patrick McGuire, Goetz von Peter, (2009), "The US Dollar Shortage in Global Banking and the International Policy Response," BIS Working Paper #291, Bank for International Settlements.**

15. **Claudio Borio, Robert McCauley, Patrick McGuire, Vladyslav Sushko, "Covered Interest Parity Lost: Understanding the Cross-Currency Basis," BIS Quarterly Review, Third Quarter 2016.**

16. **Peter Rose, Sylvia Hudgins, *Bank Management & Financial Services, 9th Edition* (New York, NY: McGraw-Hill, 2013).**
    - Chapter 7. Risk Management for Changing Interest Rates: Asset-Liability Management and Duration Techniques

17. **Andrew Ang, *Asset Management: A Systematic Approach to Factor Investing* (New York, NY: Oxford University Press, 2014).**
    - Chapter 13. Illiquid Assets

RISK MANAGEMENT AND INVESTMENT MANAGEMENT

PART II EXAM WEIGHT | 15%

Topics and Readings

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

To cover these broad knowledge points, we've shared a set of curated readings. While detailed learning objectives associated with these readings are presented in the 2025 FRM Learning Objectives document, a brief summary of how to relate these readings to the knowledge points follows.

Reading 1 introduces the factor theory of investing, in which asset and portfolio returns and risk premiums are explained by their exposure to specific factors. The first chapter describes the theory of factor risk by starting with the basic single-factor risk premium theory — the CAPM — and then examining multifactor models. The second chapter explains factors that drive risk premiums and compares two types of factors: fundamental-based factors and investment-style factors. The third chapter explores how the sets of factors used to construct a benchmark can affect portfolio alpha. Reading 2 introduces ways to construct an optimal portfolio given investment constraints.

VaR is an important tool in portfolio management, as it explicitly accounts for leverage and portfolio diversification while providing a single measure of portfolio risk. The first chapter of Reading 3 explains how managers can measure and manage portfolio VaR. The second chapter details some benefits of using VaR in investment management and introduces the process of risk budgeting.

As risk capital is a scarce resource, controls should exist to ensure that risk capital is used in a manner consistent with the firm's risk budget. Reading 4 explains how managers can develop a risk plan, provides tools for risk budgeting, and introduces guidelines for monitoring portfolio risk.

Standardized measurements are helpful for investors in comparing the performance of asset managers. Reading 5 introduces various measures to evaluate portfolio manager performance.

Hedge funds are private investment vehicles that are not open to the general investing public. Reading 6 gives a general introduction to hedge fund styles and Reading 7 describes the process of performing due diligence on funds and fund managers.

Finally, Reading 8 analyzes the predictability of investment fraud through U.S. Securities and Exchange Commission (SEC) filings and explains the efficacy of mandatory disclosures in avoiding fraud.

Readings for Risk Management and Investment Management

1. **Andrew Ang, *Asset Management: A Systematic Approach to Factor Investing* (New York, NY: Oxford University Press, 2014).**
    - Chapter 6. Factor Theory
    - Chapter 7. Factors
    - Chapter 10. Alpha (and the Low-Risk Anomaly)

2. **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

3. **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
    - Chapter 17. VaR and Risk Budgeting in Investment Management

4. **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

5. **Zvi Bodie, Alex Kane, and Alan J. Marcus, *Investments, 12th Edition* (New York, NY: McGraw- Hill, 2020).**
    - Chapter 24. Portfolio Performance Evaluation

6. **G. Constantinides, M. Harris and R. Stulz, eds., *Handbook of the Economics of Finance, Volume 2B* (Oxford, UK: Elsevier, 2013).**
    - Chapter 17. Hedge Funds

7. **Kevin R. Mirabile, *Hedge Fund Investing: A Practical Approach to Understanding Investor Motivation, Manager Profits, and Fund Performance, 2nd Edition* (Hoboken, NJ: John Wiley & Sons, 2016).**
    - Chapter 12. Performing Due Diligence on Specific Managers and Funds

8. **Stephen G. Dimmock and William C. Gerken: *Finding Bernie Madoff: Predicting Fraud by Investment Managers*, (2012).**

CURRENT ISSUES IN FINANCIAL MARKETS

PART II EXAM WEIGHT | 10%

Topics and Readings

This area focuses on current issues that have a strong impact on financial markets. The broad knowledge points covered in Current Issues in Financial Markets include the following:

- 2023 bank failures
- Artificial Intelligence (AI)
- Interest rate and inflation risk
- Private credit
- Risks of rising government debt
- Cryptocurrency regulation
- Digital resilience

To cover these broad knowledge points, we've shared a set of curated readings. While detailed learning objectives associated with these readings are presented in the 2025 FRM Learning Objectives document, a brief summary of how to relate these readings to the knowledge points follows.

Reading 1 reviews the 2023 failures of Credit Suisse, Silicon Valley Bank (SVB), Signature Bank, and First Republic Bank, and how well the existing international resolution framework was able to prevent the wider spread of market contagion. The reading describes lessons learned, including strengths and weaknesses uncovered in the resolution framework, as well as the direction of further studies and necessary improvements.

Readings 2 and 3 focus on the use of AI. Reading 2 presents the risks associated with using Generative Artificial Intelligence (GenAI) in finance, highlighting how it differs from traditional AI/ML algorithms. The reading explores concerns such as data privacy, embedded biases, cybersecurity threats, and the potential impact on financial stability, while noting the need for robust governance and regulatory oversight to ensure responsible and secure implementation in the financial sector. Reading 3 discusses the relationship between AI and the economy and emphasizes its implications for central banks, including shifts in production capabilities, investment, labor markets, and inflation dynamics. It examines the trade-offs arising from the use of AI and highlights the importance of data centrality for central banks, as well as the urgent need for central banks to cooperate in regulatory efforts.

In recent years, changes in interest rates and inflation have created a range of challenges for risk managers. Reading 4 describes interest rate risk management at banks in emerging market economies (EME banks) and compares it with the practices of banks in advanced economies (AE banks). The reading also points out the recent changes in the interest rate risk exposures of EME banks and the importance of hedging. Reading 5 examines the highly synchronized policy tightening by monetary authorities around the world aimed at controlling and reducing inflation, which had increased dramatically following the global pandemic of 2020. It describes the impacts that monetary policy changes had on markets and concludes with a highlight of potential risks that lie ahead and a recommendation on policies that need to be adopted to promote sustainable economic growth.

Reading 6 explores the fast-growing asset class of private credit, with an assessment of its risks and vulnerabilities as well as some potential policy responses that could help mitigate these risks.

Reading 7 discusses how the trajectories of fiscal and monetary policy over several decades have contributed to economic and financial imbalances in countries around the world. It describes the interaction of these policy tools through the framework of the so-called "region of stability," and details how rising levels of government debt over time and accommodative monetary policy have tested the boundaries of this region, combining with other factors to exacerbate crises and create risks for future economic and financial stability.

Reading 8 discusses the regulatory considerations and challenges brought by unbacked crypto assets and emphasizes the need for a global regulatory framework to address the rapid growth and systemic risks of the crypto ecosystem. It advocates for a proactive and coordinated approach to regulation that balances innovation with risk management.

An increasingly important factor in the stability of financial systems is their ability to be digitally resilient. Reading 9 presents some approaches and policy tools that financial regulators can use to respond to the risks around digital resilience.

Readings for Current Issues in Financial Markets:

1. **"2023 Bank Failures, Preliminary lessons learnt for resolution," FSB, October 2023**

2. **"Generative Artificial Intelligence in Finance: Risk Considerations," IMF, August 2023**

3. **BIS Annual Economic Report, Section 3. Artificial intelligence and the economy: implications for central banks, June 2024**

4. **"Interest Rate Risk Management by EME Banks," BIS Quarterly Review, September 2023**

5. **BIS Annual Economic Report, Section 1. Laying a robust macro-financial foundation for the future, June 2024**

6. **"The Last Mile: Financial Vulnerabilities and Risks, Chapter 2: The Rise and Risks of Private Credit," IMF Global Financial Stability Report, April 2024**

7. **BIS Annual Economic Report, Section 2: Monetary and fiscal policy: safeguarding stability and trust, June 2023**

8. **"Regulating the Crypto Ecosystem: The Case of Unbacked Crypto Assets," IMF Fintech Notes, September 2022**

9. **Jose Ramon Martinez, "Digital Resilience and Financial Stability, The Quest for Policy Tools in The Financial Sector," Banco de Espana, April 2023. Jose Ramon Martinez, Banco de Espana.**

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