

## **Financial Risk Manager Handbook** By Philippe Jorion

Financial Risk Manager Handbook is a comprehensive reference and training guide for financial risk management written by Philippe Jorion, Professor of Finance at the Graduate School of Management at the University of California at Irvine. The Handbook focuses on practical financial risk management techniques and solutions that are the core of the Global Association of Risk Professionals (GARP) Financial Risk Manager (FRM) designation exam. The FRM exam focuses on analytical skills, general knowledge and intuitive capability acquired through experience in capital markets, general behavior and risks of various markets and financial instruments, regulation, and credit risk concepts. The Handbook provides step-by-step guidance through the entire FRM syllabus, with clear, concise explanatory chapters and example problems. (See [www.garp.com](http://www.garp.com) for more on the FRM exam.)

At 808 pages, the Handbook may at first seem large, but not when you consider the breadth of what it is covering over seven main sections: Quantitative Analysis; Capital Markets; Market Risk Management; Credit Risk Management; Operational and Integrated Risk Management; Legal, Accounting and Tax Risk Management; and Regulation and Compliance. The depth of coverage is also impressive, as is the economy of words. It aims to teach you a lot about a lot of financial risk management, and it succeeds.

**Part I, Quantitative Analysis** (Chapters 1-4), reviews fundamentals of bonds, probability, statistics and Monte Carlo methods. Most actuaries can probably skip the first three chapters, as they are covered in greater detail on the actuarial syllabus. However, the Monte Carlo chapter provides a concise introduction to Markov processes, geometric Brownian motion, and binomial trees—all foundational concepts of modern capital market simulation studies. Section 4.3 even includes the Cholesky factorization as a means of generating simulated variables with a desired correlation structure.

**Part II, Capital Markets** (Chapters 5-10), provides a broad, high-level overview of all the major categories of capital market instruments. It introduces derivatives (forwards, futures and swaps), options, fixed income securities, fixed income derivatives, equity markets, and currencies and commodities markets. The emphasis of these chapters is on practical and concise. Readers familiar with for example the CAS Exam 8 material will find the Handbook's treatment much more limited.

**Part III, Market Risk Management** (Chapters 11-17), is one of the lengthiest parts—with good reason. Chapter 11 begins with an introduction to market risk measurement (principally Value-at-Risk or VAR), giving the details behind the theory and application of this market standard approach. Limitations of VAR are also discussed, as well as the need to supplement VAR analyses with stress testing. Chapter 12 then goes into the identification of risk drivers. The simplest framework separates exposure from risk factors—that should make all actuaries feel right at home! Next, attention is focused on discontinuities in returns, event risk and liquidity. Chapter 13 then delves into risk sources: currency volatility, correlations, and devaluation; yield curve issues, bond prices,

credit spreads, and prepayment; equity including the CAPM and APT models; and finally commodities. It's a menu of rich topics.

Chapters 14-17 explore the essentials of linear and non-linear hedging; normal and non-normal risk factor models; and methods for calculating VAR under either so-called "local" (closed-form) or "full" valuation methods (including either Monte Carlo or historical simulations). Chapter 15 on non-linear hedging provides an excellent overview of the infamous "Greeks" –  $\delta$ ,  $\gamma$ ,  $\omega$ ,  $\rho$ , and  $\tau$  – that pepper so many option risk management publications. A solid introduction like this really helps break the often-intimidating jargon barrier.

**Part IV, Credit Risk Management** (Chapters 18-23), is also extensive with good reason—like Part III. Chapter 18 introduces the terminology of credit risk—e.g., settlement risk, credit exposure, default, and loss given default. Chapter 19 then explains "Measuring Actuarial Default Risk," which ought to make every actuary beam with pride! In reality, this chapter covers the "pseudo-collective risk" approach to default based on exposures, default rates (~claim counts), and losses given default (~claim severities). Significant research exists on this technique; this chapter only scratches the surface. Suffice it to say the "cross-over" of actuarial techniques from insurance to the capital markets is complete in the realm of credit risk.

Chapter 20 explores the fundamental concepts of yield spreads on corporate bonds, and equity pricing using the Merton model. It almost seems unfair to cover such seminal topics in one chapter, yet the Handbook does a credible job of outlining the essentials and following up with practical examples. Subsequent chapters cover the essentials of credit exposures and credit derivatives (an exploding field with a somewhat checkered reputation). Part IV concludes with a survey of the leading credit risk models—CreditMetrics, CreditRisk+, KMV, and Credit Portfolio View.

**Part V, Operational and Integrated Risk Management** (Chapters 24-27), introduces readers to an often-ignored area of risk—but ignored at one's peril. Operational risk focuses on the processes and practices companies use to execute their business. Some of the most infamous recent capital market scandals (e.g., "rogue trader" Nick Leeson of Barings) were caused by breakdowns in operational risk controls. Chapter 25 provides an overview of risk capital allocation and risk-adjusted return on capital or "RAROC." Best practices reports of the G-30, Bank of England report on Barings, and the Counterparty Risk Management Policy Group (CPRMG) report on Long Term Capital Management are explored in Chapter 26. Finally, Chapter 27 introduces *firmwide* risk management concepts and the application to securities firms.

**Part VI, Legal, Accounting and Tax Risk Management** (Chapters 28-29), will make casualty actuaries long for the days of the old Part Eight exam, back when it covered law and regulation. Chapter 28 covers legal and contractual aspects of securities transactions. Of special note is Section 28.4.3, a helpful glossary of some common but confusing legal terms. Chapter 29 follows that with a review of many subtle accounting and tax issues, including marking to market and regulatory reporting.

**Part VII, Regulation and Compliance** (Chapters 30-32), begins with a broad overview of securities and banking regulation. Chapter 31 then delves into the famous Basel Accord, an international set of standards that has had far reaching effects on financial risk management around the world. Chapter 32 brings the Handbook to a close with a discussion of the Basel market risk charges.

Overall, the FRM Handbook is an excellent training and self-teaching reference for learning a lot about a lot of financial risk management.