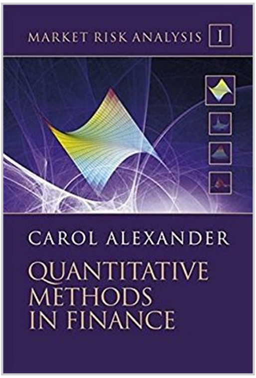

Market Risk Analysis, Quantitative Methods in Finance (Volume I)

By Carol Alexander

Market Risk Analysis, Quantitative Methods in Finance (Volume I) By Carol Alexander

Written by leading market risk academic, Professor Carol Alexander, *Quantitative Methods in Finance* forms part one of the *Market Risk Analysis* four volume set. Starting from the basics, this book helps readers to take the first step towards becoming a properly qualified financial risk manager and asset manager, roles that are currently in huge demand. Accessible to intelligent readers with a moderate understanding of mathematics at high school level or to anyone with a university degree in mathematics, physics or engineering, no prior knowledge of finance is necessary. Instead the emphasis is on understanding ideas rather than on mathematical rigour, meaning that this book offers a fast-track introduction to financial analysis for readers with some quantitative background, highlighting those areas of mathematics that are particularly relevant to solving problems in financial risk management and asset management. Unique to this book is a focus on both continuous and discrete time finance so that Quantitative Methods in Finance is not only about the application of mathematics to finance; it also explains, in very pedagogical terms, how the continuous time and discrete time finance disciplines meet, providing a comprehensive, highly accessible guide which will provide readers with the tools to start applying their knowledge immediately.

All together, the Market Risk Analysis four volume set illustrates virtually every concept or formula with a practical, numerical example or a longer, empirical case study. Across all four volumes there are approximately 300 numerical and empirical examples, 400 graphs and figures and 30 case studies many of which are contained in interactive Excel spreadsheets available from the accompanying CD-ROM . Empirical examples and case studies specific to this volume include: Principal component analysis of European equity indices;

- Calibration of Student t distribution by maximum likelihood;
- Orthogonal regression and estimation of equity factor models;
- Simulations of geometric Brownian motion, and of correlated Student t variables;
- Pricing European and American options with binomial trees, and European options with the Black-Scholes-Merton formula;
- Cubic spline fitting of yields curves and implied volatilities;

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Editorial Review

Review
'...one of those rare gems...breaking down the barriers and demystifying finance.' (Market-Melange.com, January 2011).

From the Inside Flap
Market Risk Analysis is a series of four volumes:

Volume I: *Quantitative Methods in Finance*

Volume II: *Practical Financial Econometrics*

Volume III: *Pricing, Hedging and Trading Financial Instruments*

Volume IV: *Value at Risk Models*.

Although the four volumes are very much interlinked, each containing numerous cross-references to other volumes, they are written as self-contained texts.

Volume I covers the essential mathematical and financial background for subsequent volumes. There are six comprehensive chapters covering all the calculus, linear algebra, probability and statistics, numerical methods and portfolio mathematics that are necessary for market risk analysis. It is a complete and pedagogical introduction to quantitative methods applied to finance.

Volume II provides a detailed understanding of financial econometrics, with a unique focus on applications to asset pricing, fund management and market risk analysis. It covers equity factor models, including a detailed analysis of the Barra model and tracking error, principal component analysis, volatility and correlation, GARCH, cointegration, copulas, Markov switching, quantile regression, discrete choice models, non-linear regression, forecasting and model evaluation.

Volume III has five extensive chapters on the pricing, hedging and trading of bonds and swaps, futures and forwards, options and volatility, and detailed descriptions of mapping portfolios of these financial instruments to their risk factors. There are numerous examples, all coded in interactive Excel spreadsheets, including many pricing formulae for exotic options but excluding the calibration of stochastic volatility models, for which Matlab code is provided.

Volume IV builds on the three previous volumes to provide a comprehensive and detailed treatment of market VaR models. The exposition starts at an elementary level but, as in all the other volumes, the pedagogical approach accompanied by numerous interactive Excel spreadsheets allows readers to experience the application of parametric linear, historical simulation and Monte Carlo VaR models to increasingly complex portfolios. Starting with simple positions, readers are soon applying risk models to large international securities portfolios, commodity futures, path dependent options and much else. This rigorous treatment includes many new results and applications to regulatory and economic capital allocation, measurement of VaR model risk and stress testing.

Each volume is accompanied by a CD-ROM which features numerous interactive Excel spreadsheets that illustrate the vast majority of the problems and case studies in these texts. For further information see the accompanying CD-ROM.

From the Back Cover
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