# Introducing Value-at-Risk

Course Outline

**FORT GREY** CONSULTING

Tutor: Dr Quintin Rayer

# Introducing Value-at-Risk

## Overview

Value-at-Risk (VaR) is a widely-used risk measure in finance. However it is not without weaknesses if its limitations are not fully appreciated.

This course focuses on VaR, including what it is, its relationship to probabilities, assumptions and many of the methods used to estimate it for financial assets.

The course includes the interpretation of VaR statements, parametric VaR, conversions between VaR types and application to multi-asset portfolios. Issues of non-normality are addressed through historical (and historical simulation) VaR, Cornish-Fisher VaR and Monte-Carlo simulation VaR. Monte-Carlo simulation is also used in an example calculation for a call option.

Examples are provided throughout to help practitioners appreciate key concepts.

The estimated time required to complete this course is 6-8 hours.

## Target Audience

- Professionals in the financial services sector who wish to improve, or refresh, their knowledge of risk measurement methods for portfolios or funds, understand the concepts behind Value-at-Risk, and appreciate and implement Value-at-Risk calculations.

- This includes staff new to risk functions who wish to gain an overview of the various quantitative methods used to analyse portfolio risk.

- Although risk measurement has the potential to be a mathematically-intensive topic, this course keeps mathematics to an intermediate level so that only an appreciation of mathematical summation and matrices is required. This supports those financial professionals without a quantitative background, but who require a strong appreciation of the core concepts.

# Introducing Value-at-Risk

## Course Outline

1. **Introduction**
   Sources of risk – classification – ex ante and ex post.
2. **What is Value-at-Risk?**
   What is VaR?  Key elements of VaR – returns distributions.
3. **Volatility**
   Volatility and risk – criticisms – normal distribution – probabilities of extreme events - examples.
4. **VaR Statement & Basic Parametric VaR**
   VaR statements, examples – single asset parametric VaR, examples, pictures – VaR value conversions.
5. **Basic VaR Methods**
   Overview of methods – parametric VaR assumptions – historical VaR, examples.
6. **Parametric VaR with Many Assets**
   Correlation – combining volatilities for two assets, example – combining volatilities for many assets, examples.
7. **Cornish-Fisher VaR**
   Improving on parametric VaR – non normality – skew and kurtosis – Cornish-Fisher VaR, example.
8. **Historical Simulation VaR**
   Problems with historical VaR – more than one asset – worked example.
9. **Monte-Carlo Simulation VaR**
   Simulated stock price paths – return distributions – Monte-Carlo VaR of a call option.
10. **Summary**
    Overview – contact details.

## Tutor

### Dr Quintin Rayer

BSc, ARCS, DPhil, CPhys, Chartered FCISI, Chartered Wealth Manager, SIPC

Consultant

- Dr Quintin Rayer is a Chartered Fellow of the Chartered Institute for Securities and Investments, a Chartered Wealth Manager, holds a Physics degree from Imperial College London and a Physics doctorate from Oxford University.

- Quintin has applied knowledge from nuclear and aerospace engineering to areas in finance, working for actuarial and investment consultancy firms as well as a multi-national European bank for nearly ten years.

- Projects have included substantial and innovative development of quantitative fund selection and analysis techniques, risk monitoring and portfolio optimisation, including in-house training for analysts and relationship managers.

- Quintin has completed the Sustainable Investment Professional Certification (SIPC) with the John Molson Business School, becoming this programme's first graduate in the Channel Islands and the second in the UK.

# Introducing Value-at-Risk

## Course Benefits

- Improved understanding of what Value-at-Risk is and how to use it with assets and portfolios.

- Appreciations of the limitations and assumptions behind different Value-at-Risk measures.

- Calculation of Value-at-Risk for multi-asset portfolios.

- A range of VaR methods including parametric VaR, Cornish-Fisher VaR, historical VaR, historical simulation VaR, Monte-Carlo simulation VaR.

- Examples throughout to aid understanding.

- Course completion certificate as evidence for meeting Continuing Professional Development (CPD) requirements.

## Course Content Includes

- Slides to work through at your own pace.

- Video: narrated slides with explanations of the material covered.

- Video animations to illustrate key concepts.

- Video: television presenter style.

- Worked examples.

- Test questions to check understanding.

- Course certificate that can be downloaded as proof of completion.