

This 2-day course is specifically designed to expand participants' knowledge of, and skills with respect to, risk, exposures, managing uncertainty, portfolio management, setting limits, and implementing controls. Next, this program aims at products and potential price changes. The focus is on risk management with respect to trading & portfolio management, and therefore the primary aim is at market risk. Ways to measure or quantify risk are essential in this course. Scenario analysis as well as sensitivity analysis are therefore also included.

Although the course is about risk management and statistics are important in that field of expertise, and although a bit of mathematics is incorporated, in this course things are brought forward in a way that everybody is able to understand. This however does not effect the level of the course in a negative way, but allows for taking all subject even more in-depth than you can imagine.

Learning objectives

Acquiring insight and knowledge of:

- Quantification of risk; measuring exposures with Excel
- Calculation of exposures, and -more importantly- the interpretation of such
- Quantification methods; practical approaches
- Value at Risk; What is it? What are its limitations?
- Varieties of Value at Risk approaches
- Advantages and limitations of the Value at Risk methodology
- Stress testing; Why? How?
- Correlation coefficients and their applications; What is their use? Limitations?
- Expected shortfall; Conditional VaR; What is it? How must it be interpreted? How to calculate it?
- Implications of changes in volatility
- Implications of the lack of or changes in liquidity

Target group

This program is specifically developed for Risk managers and Analysts, but more in general it is also very suitable for:

- Mid & Back Office staff
- ICT experts & Project managers
- Legal staff & Compliance officers
- Accountants & Controllers
- Finance & control staff
- Asset & portfolio managers & Traders
- Employees of exchanges
- Staff of clearing organizations
- Dispatchers (Operators or Shift traders)
- Sales managers & staff
- Originators

2-DAYS VAR – CALCULATIONS, INTERPRETATIONS & EXTENSIONS

DAY 1 & 2

Session 1

Measuring market risk

- Quantification of risk; difference between risk and uncertainty
- Calculating exposure(s); using common sense
- Business model; focus at practice
- Terminology & Statistics
 - Why is it important?
 - Understanding even more important than applying figures and models?
 - Standard deviation
 - Volatility (Annual. SD)
 - Future volatility
 - Estimated volatility
 - Historical volatility
 - Implied volatility
 - Variation & covariation
 - Correlation
 - Co-integration
 - Normal distribution & Log-normal distribution
 - Mean, median & modus

Exercise

Calculate variance and SD

Session 2

Value at Risk

- Value-at-Risk (VaR) concept
 - Definition of VaR
 - What is it?
 - What is it used for?
 - (Dis)advantages?
 - Methodology
 - Underlying value
 - Notional
 - Volatility; + its impact
 - Liquidation period
 - Confidence level
 - Types of VaR methodologies
 - Historical Sim
 - Vari-Covar
 - Monte Carlo

Exercise

Calculation of VaR (Variance-Covariance Method) of an oil & gas portfolio

Session 3

Monte Carlo Simulation

- Monte Carlo simulation technique
 - Assumptions
 - Running multiple scenarios
 - Different outcomes
 - Distribution pattern
 - Suitable for portfolios containing flexibility
 - Suitable for options

Simulation

MC sim (Power portfolio)

Session 4

Expected Shortfall

- Beyond Value at Risk
 - VaR has limitations, so what are alternatives?
 - What are add-ons?
- Conditional Value at Risk-CVaR
 - What happens in the small percentile?
 - Expected shortfall
 - Expected loss

Exercise

Expected Shortfall - CVaR

Session 5

Event risk & Stress tests

- Event risk
 - Tail risk: black swans, fat tails, one-time-events
 - Skew(ness); What is it? Its consequences?
- Event risk management
- Stress tests & their use
 - Ignore all correlations
 - Set all correlations at 0
 - Set all correlations at 100% (plus or minus)
 - Worst case performance
 - Worst losing streak
- Back testing

Exercise

Stress testing

Trading simulation

Futures trading

Session 6

Model risk

- Price volatility
 - Historical volatility versus future volatility
 - Reference period
 - Volatility trending
- Correlation
 - Normality
 - Linearity
 - Cross-margining
- Liquidity risk
 - Dynamics of liquidity
 - Bid-ask obligations

Exercise

Liquidity, volatility, correlation?

Excel

Calculate Spark spread volatility

Excel

Calculate the correlation of a product based on a data set

Session 7

Greek variables

- Sensitivity analysis
 - Delta
 - Gamma
 - Vega;
 - Theta
 - Rho
- Scenario vs sensitivity analysis
- Combined reporting - Matrix

Simulation

Trading options

Session 8

Asset & Portfolio management

- Managing a mixed portfolio of assets, obligations and a client base
- A portfolio consisting of multiple energy products
 - Delta hedging
 - Dynamic hedging
 - Embedded options
 - Real options

Exercise

Embedded options; flex