F71QR Quantitative Risk Analysis

COURSE DETAILS
Course Code: F71QR
Full Course Title: Quantitative Risk Analysis
SCQF Level: 11
SCAF Credits: 15
Available as Elective: No

DELIVERY LEVEL
Undergraduate: No
Postgraduate Taught: Yes
Postgraduate Research: No
Additional Information:

COURSE AIMS
The aims of this course are:
• To provide a thorough grounding in the wide range of risks that a financial institution or other enterprise might be exposed to
• To provide an introduction to the statistical methods underpinning financial risk management
• To teach students the different methods of assessing financial risk
• To equip students with a variety of tools to tackle problems involving financial data

LEARNING OUTCOMES – SUBJECT MASTERY
On completion of this course the student should be able to:

• Demonstrate an understanding of the different reasons for measuring financial risk.
• Describe and apply the different measures of financial risk
• Define what is meant by a coherent measure of risk;
• Use appropriate statistical and computational methods to determine the fatness of the tails of returns data
• Describe and apply the main univariate and multivariate distributions to financial data
• Describe and apply the fundamental concepts and theorems in Extreme Value Theory (EVT)
• Describe how analysis of financial data using EVT differs from traditional statistical methods
• Describe and apply the main statistical methods in EVT to financial data
• Demonstrate how multivariate returns can be described using marginal distributions and copulas
• Describe and apply the main copulas
• Explain how the use of different copulas can affect the returns distribution on a portfolio containing two assets
• Demonstrate a good understanding of the different sources of credit risk and credit spreads
• Understand how ratings agencies assess risk
• Explain the risk management control cycle
• Describe the feedback loop in risk management
• Define what is meant by securitization and alternative risk transfer
• Describe different forms of risk transfer and their advantages

• Use appropriate statistical software to analyse problems involving financial risk
• Show an awareness of the different approaches to modelling and managing credit risk
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- Use an appropriate computer package to analyse financial data and solve complex problems

## LEARNING OUTCOMES – PERSONAL ABILITIES

- Show an appreciation of the interface between academic theory and industrial practice
- Show an appreciation of the societal role of risk management in protecting the consumer and other stakeholders
- Demonstrate the ability to learn independently and as part of a group
- Manage time, work to deadlines and prioritise workloads
- Use an appropriate computer package to analyse financial data and solve complex problems
- Present results in a way that demonstrates that they have understood the technical and broader issues of financial risk management

## SYLLABUS

### Introduction
- The concept of Enterprise Risk Management, the drivers behind it and the resulting value to organisations
- Risk and uncertainty, different definitions
- Direct and indirect stakeholders in an enterprise: Relevance of risk measurement and management to all stakeholders
- Risk taxonomy and overlaps

### Quantitative Analysis of Financial Data
- Quantifiable and non-quantifiable risks
- Common univariate distributions, model fitting and diagnostic tests
- Extreme value theory
- Common multivariate distributions
- Modelling multivariate risks using copulas
- Different measures of correlation including tail correlation
- Risk measures; coherent risk measures
- Model and parameter risk
- Backtesting

### Contagion and Credit Risk
- Sources of credit risk; contagion
- Theoretical and commercial approaches to modelling credit risk

### Risk Management
- Securitisation and alternative risk transfer
- The risk management control cycle
## COURSE RELATIONSHIPS

N/A

## LOCATION AND ASSESSMENT METHODS

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