



ST9 – Exploding the Myth

Graham Crowley

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ST9 – Enterprise Risk Management

- New ST Specialist Subject
- IoA - 200 hrs of study recommended
- First exam sitting in April 2010
- Exams every April and September



What is Enterprise Risk Management?

- No single definition
- Application of risk management across the whole of the enterprise in a structured and consistent way
- Considers all risks and interaction with one another
- Integrating risk measurement and management into business processes so risk information can influence strategic business decisions



ST9 Syllabus

- ERM Concepts

- Holistic

- Upside as well as downside

- Qualitative and quantitative measurement

- Risk Responses

- Dynamic Process



ST9 Syllabus

- ERM Framework
 - ERM Best Practice in Compliance and Corporate Governance e.g. Dey Report in Canada, UK Combined Code on Corporate Governance
 - The role of the regulator in regulatory environments
 - Understand risk frameworks in regulatory environments e.g. Solvency II, Basel II



ST9 Syllabus

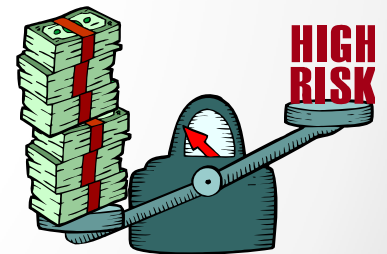
ERM Framework

- Stakeholders
- Risk appetite, risk profile, risk tolerance, risk capacity
- Risk Management Control Cycle
- RMF Structure e.g. CRO, risk personnel
- Risk Taxonomy



ST9 Syllabus

- Risk Identification Process
 - Who should be involved
 - Questionnaires/workshops
 - Risk Identification Aids e.g. SWOT, PEST
- Risk Measurement and Assessment
 - VaR, TVaR, Prob. Of Ruin
 - Definition, Properties and Limitations
 - Scenario Analysis and Sensitivity Testing



ST9 Syllabus

- Analysis of Time Series
- Methods of Risk Aggregation
 - Different correlation approaches
 - Copulas e.g. Gaussian, Gumbel
- Tail distributions, tail dependence and EVT

ST9 Syllabus

- Risk Management Tools and Techniques
 - Risk Optimisation – portfolio theory
 - Risk Responses
- Economic Capital – what is it?
- Development/ Uses of an Economic Capital Model
- Calculating Economic Capital
- Allocation of Economic Capital
 - Correlation, diversification
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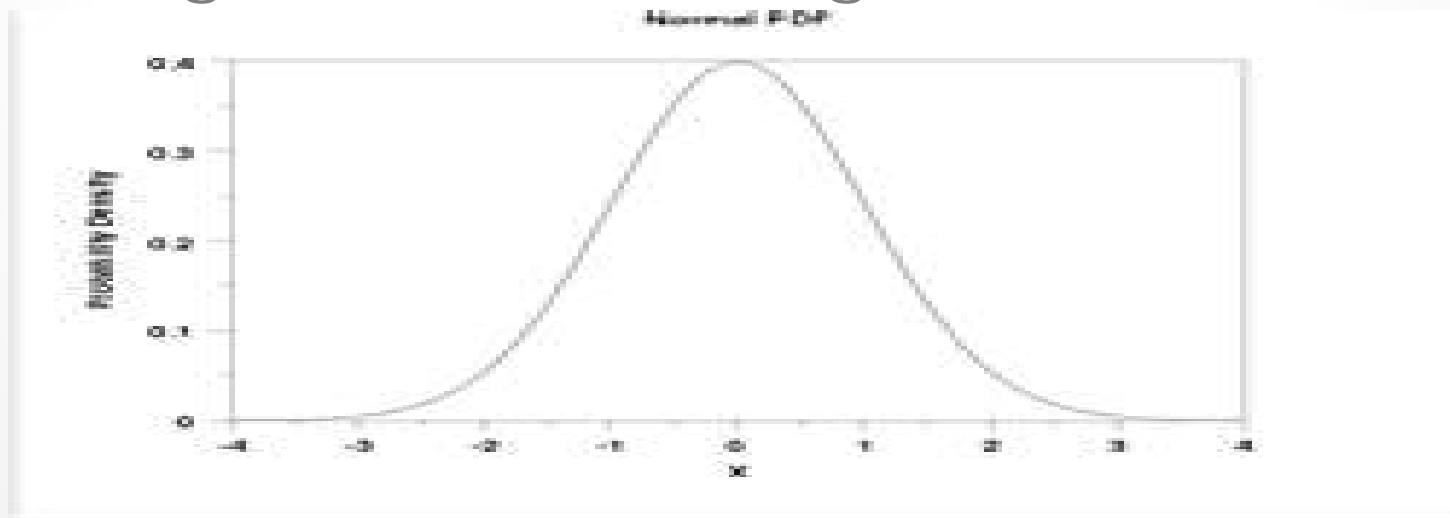
ST9 Syllabus

- Case Studies/Lessons Learned
 - Barings
 - LTCM
 - Confederation Life
 - Equitable Life
 - Enron
 - Orange County



Mathematical Concepts

- Distributions
 - Normal, Lognormal, Poisson, etc.
 - Mean, Variance, Skewness, Kurtosis
 - Fitting distributions using MoM /MLE



Mathematical Concepts

- Analysis of Financial Time Series
 - Multivariate Normal Distributions
 - Matrix Multiplication, Normality Tests
 - ARCH / GARCH Models
 - Fitting GARCH Models to Data Using MLE/MoM



Mathematical Concepts

- Risk Measure Calculations
 - VaR
 - TVaR
- Credit Risk Models
 - Black-Scholes
 - Merton
 - Distance to Default



Mathematical Concepts

- Copulas and Correlation
 - Deriving the copula using moment generators
 - Calculating linear correlation
 - Calculating rank correlation e.g. Spearman's Rho, Kendall Tau
 - Coefficients of tail dependence for various copulas

Past Mathematical Questions

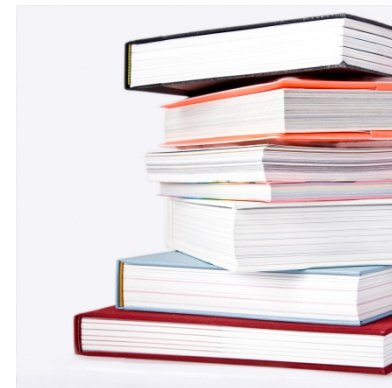
- September 2011 – 22%
 - VaR, TVar, Economic Capital, Merton/Credit Migration Model
- April 2011 – 3%
 - Copula calculation
- September 2010 – 10%
 - Fitting a distribution to data using MLE
- April 2010 – 10%
 - Copula/Correlation calculations

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Resources Available

- Institute of Actuaries
 - Core Reading
 - Exam Papers
- Books
 - Financial Enterprise Risk Management by Paul Sweeting
 - Enterprise Risk Management from Incentive to Controls by James Lam
- Acted
 - Summary Course Notes
 - Tutorials – 3 day
 - Exam Papers
- Work Experience
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Benefits of Passing ST9

- FIA + ST9 = Chartered Enterprise Risk Actuary
 - Internationally recognised risk management qualification
 - More info at www.ceranalyst.org
- Career Prospects
 - Advancement and/or Move into Other Areas



- Remuneration
- CPD



A Qualified Actuary's Perspective

- Challenges associated with studying ST9
 - More responsibility at work = Longer Hours => Less Time to Study
 - No Study Leave
 - Partner and Kids
 - Hobbies



Questions

