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Scientific Methods for Quantifying and Managing Financial Risk

XXI Graduate Days

Heidelberg 2008

Monday: Introduction

- From Physics to Finance
- From Physics to d-fine
  - Quantitative Finance
  - Risk management
  - MSc and MBA Trainings
  - FAQs

Tuesday: Merton style credit portfolio models Part I

- Risk and capital management
  - Principles of risk-return based profitability management
  - Bank steering instruments
- Introduction to Merton style credit risk portfolio modeling
  - Economic capital calculation & allocation framework
- Details of implementation aspects
  - Approximate methods for the treatment of large portfolios
  - Allocation of economic capital to transaction level (variance reduction techniques)
  - Mark-to-model (loan valuation, migration matrices, etc.)

Wednesday: Merton style credit portfolio models Part II

- Integration of structured products
  - Common features of Collateralized Debt Obligations (CDO's)
  - Modeling assumptions
  - Capital allocation for CDOs
  - Modeling correlated default times
  - Approximation by means of large aggregates
- Credit risk modeling under economic stress scenarios
  - Stress testing framework within a Merton style multi factor model
- Aggregation of risk types: market-, credit- and operational risk

Thursday: Statistical Validation of Credit Rating Systems

- Bayesian Probability and Coherence
- Bayesian Inference and Bayesian Learning
- PD Estimation with Power Curves
- Tests using Power Curves
- Likelihood Ratio Methods for Rating Systems
- Measuring Likelihoods
- Back Testing and Validation


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