QF609 Risk Analysis
Lecture Notes 9

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Overview

Main topics:

- Final Exam Review
- Practice Problem Sets

Final Exam Review

The exam questions mainly aim to test your understanding of:

- lecture notes
- practice problem sets

You will need to bring a scientific calculator which has exponential function, logarithm function, and is able to take power of a numbers. A standard normal CDF table will also be provided.

Final Exam Review

The exam topics include:

- accrual accounting and MTM accounting
- repricing gap model:
  - identification of repricing gap and date
  - EV and NII sensitivity calculations
  - pros and cons of repricing gap model
- simple mortgage mathematics
- duration model:
  - coupon bond price calculation
  - bond price characteristics with respect to coupon rate, yield, and maturity
  - Macaulay duration and modified duration
  - durations of assets and liabilities
  - convexity

Final Exam Review

- basic statistics:
  - mean, variance, covariance
  - Law of Large Number (LLN)
  - Central Limit Theorem (CLT)
  - simulation of random variables
- basic VaR concepts, calculation, and comparision between different VaR methods
- correlation matrix decomposition and factor loading matrix
- PCA
- rank reduction of a correlation matrix