

FinTech 590

Quantitative Risk Management

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Introductions

Expectations

- Book
 - Options, Futures, and Other Derivatives - Hull
 - Recommended: Elements of Financial Risk Management 2nd edition - Christofferson (out of print, eTextbook available on Amazon).
- Class Participation
- Weekly Project
- Exam
- Grading
 - 40% Projects
 - 60% Final Exam
- Office Hours

Course Schedule

Date	Topics	Weekly Project
1/5/2022	Introduction, Course Syllabus and Expectations, Review Univariate Statistics	No
1/10/2022	Multivariate Statistics, Regression Models, Time Series	Yes
1/17/2022	No Class	
1/24/2022	Financial Data -- Common issues, Monte Carlo Methods	Yes
1/31/2022	Value at Risk, Delta Normal, Historical, Simulated	Yes
2/7/2022	Non-normal Monte Carlo, Gaussian Copula, Other risk measures	Yes
2/14/2022	Portfolio Construction and Risk. Factor Models, Risk Budgets, Optimization	Yes
2/21/2022	Forward Curve Construction, Rates, FX	Yes
2/28/2022	Bond Valuation, Derivatives – Futures, Forwards, and Swaps	Yes
3/7/2022	No Class	
3/14/2022	Options, Valuation Methods and Greeks	Yes
3/21/2022	Scenario and Stress Testing, Credit and Other Types of Risk	No
3/28/2022	Speaker	No
4/4/2022	Speaker	No
4/11/2022	Speaker	No
4/18/2022	No Class	
4/25/2022	Final	

Weekly Projects and Final Exam

- Weekly Projects

- 8 total - 10 point scale
- 8 points Written Paper and Slides
- 2 points code
- Programming Language of choice, C/C++, Python, Julia.

- Final Exam

- No project last 3 weeks, instead work on your code to create a risk management library
- Open book final.
- Data + Questions + Your code library

Example Project

Projects and GitHub

- All class materials are in my GitHub –
<https://github.com/dompazz/FinTech590-RiskManagement>
- All your code should be checked into GitHub by project due date.
 - I will pull all code repositories on the due date.
 - Put each week's code into a folder named "WeekXX" where XX is the week number
 - Your repo must be publicly viewable.
 - You must submit your repo address via Sakai as your homework this week.
 - Put any instructions to run your code in Readme.md in each week's folder.
 - Explain it like I know nothing.
 - Test everything. Ask a friend to test your code. If I cannot run it, you do not get credit

Risk Management

- What is Risk Management

Risk management is the process of understanding and managing, to an acceptable level, the risk of loss to a company's earnings and balance sheet.

- Why?

- Types of Risk:

- Market Risk*
- Credit Risk*
- Liquidity Risk
- Operational Risk
- Business Risk