

Financial Risk Management

FINA 7397

Summer 2018

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Office hours: one hour before class
Class location: MH 112
Class times: July 9 – August 8; Tu Th 6:00 – 10:00PM

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Course Objective

The practice of professional securities trading is associated with a variety of financial risks. The primary objective is to become familiar with the theory and practice of managing those risks. The course covers institutional details of financial asset trading, primary problems facing risk managers and the principles/tools they use to manage risk.

We will discuss the use of as futures and options (includes pricing, risks involved, replication and arbitrage), statistical properties of asset prices and interest rates along with measures to predict downside portfolio risk (e.g. Value-at-Risk, Expected Shortfall), and practical aspects of regulatory environment (after the crisis, financial firms' risk management practices are greatly influenced by regulatory standards).

Course Logistics

Most of the course materials, activities, communications, and instruction will be delivered using the UH course management software, "Blackboard" or "Bb". You can find all lecture notes and supplemental readings there.

Caveat and Promise

I will attempt to adhere to the dates, policies, and instructions in this syllabus. I will do the same for all materials and instructions on the Blackboard site for this class. However, I do reserve the right to reorganize activities and/or topics in order to meet student learning needs. Please consult Blackboard regularly as all changes and updates will be announced there.

Course Materials

- Textbooks (recommended):
 - *Financial Risk Management Handbook* by Philippe Jorion, 6th ed., Wiley, 2011
 - *Financial Risk Management* by Allan M. Malz, Wiley, 2011
 - *Investments* by Zvi Bodie, Alex Kane, Alan J. Marcus, 11th ed., McGraw-Hill, 2018
 - *Derivatives Markets* by Robert L. McDonald, 3rd edition, Pearson, 2012
- *Lecture Notes* - available on the Bb
- Recommended periodicals and newspapers: [*The Economist*](#), [*The Wall Street Journal*](#), [*Bloomberg*](#), etc.
- *Books for fun*:
 - [*A Random Walk Down Wall Street*](#) by Burton Malkiel
 - [*When Genius Failed. The Rise and Fall of Long-Term Capital Management*](#) by Roger Lowenstein
 - [*Big Bets Gone Bad*](#) by Philippe Jorion

- [*Devil Take the Hindmost: A History of Financial Speculation*](#) by Edward Chancellor
- [*Fooled by Randomness*](#) by Nassim Nicholas Taleb
- [*The Black Swan*](#) by Nassim Nicholas Taleb
- *Movies for fun:* [*Wall Street*](#), [*The Big Short*](#), [*Boiler Room*](#), [*Rogue Trader*](#), [*Trading Places*](#)

There are assigned readings for each class. I expect that students come to class prepared for the materials that will be covered that day (the required readings will be listed on Bb). I may make cold calls on students to answer questions. I do not expect perfect answers from you, the thought process is way more important. I also strongly encourage students to ask questions - in many cases an insightful question is more valuable than a correct answer. You will also receive an extra point to your score on the Final Exam for catching each of my mistakes (believe me, you will have many chances). There is a limit of one point per person per lecture though.

Course Requirements and Grading

There will be three to four individual written assignments, one midterm, and a final exam. The lowest grade on your assignments will be dropped. The midterm and the final exam will be closed-book. You can bring one standard size (8.5 x 11) cheat-sheet (both sides) for the midterm and two standard size (8.5 x 11) cheat-sheets (both sides) for the final exam.

Your grade will be based on your class participation, assignments, the midterm and the final exam. The weights are given below:

Attendance	bonus 1%
Assignments	30%
Midterm	30%
Final Exam	40%

Exam scores will be curved as a percentage of the highest score achieved among all students. If your Final Exam grade is better than the midterm, I will replace your Midterm grade with the Final Exam Grade. Don't hesitate letting me know if you think that you were adversely affected by a grading error (you do not have to report any grading errors in your favor).

Attendance

Attendance is expected (and taken) for every class. If you **have to** miss a class, you **do not** have to ask for my permission. Just remember that class attendance may add up to 1% bonus to your grade.

Academic Honesty

Students have the responsibility to know and strictly observe the University of Houston Academic Honesty Policy as described at <http://www.uh.edu/provost/policies/honesty/>. Violators will be sanctioned according to the Sanctions in the Graduate Catalog as described at http://publications.uh.edu/content.php?catoid=22&navoid=6240#Article_4_Sanctions.

Preliminary Course Topics Outline

- I. Introduction / Overview of financial risks (Malz 1.2)
 - Why should you manage risk?
 - Market risk
 - Credit, counterparty, and liquidity risk
 - Operational, model, reputational, and compliance risk

- II. Risk, return distributions and portfolios (Jorion 2-3, Malz 2.2, 2.4)
 - Defining returns: arithmetic and logarithmic
 - Total, nominal, and real returns
 - Univariate and multivariate return distributions
 - Return characteristics
 - Portfolios and diversification
- III. Market equilibrium and market efficiency (Jorion 1.3, 1.4, Malz 2.2, 2.3)
 - Risk, expectations and asset prices
 - Investor choice
 - Capital asset pricing model
 - Forecasting asset returns
 - Random walks
 - The standard model of asset price dynamics: and geometric Brownian motion
 - The information in asset prices
 - Capital market efficiency
- IV. Value-at-Risk (Jorion 1.1, 5, Malz 3)
 - Time variation in return behavior across assets
 - Return volatility measurement and forecasting
 - Estimating volatility via GARCH
 - Estimating volatility via EWMA
 - Definition and motivation of Value-at-Risk
 - Computing Value-at-Risk: parametric, Monte Carlo, and historical simulation approaches
 - Alternatives to Value-at-Risk: expected shortfall
 - Alternatives to Value-at-Risk: stress testing
- V. Assessing the accuracy of Value-at-Risk (Malz 11)
 - Limitations of Value-at-Risk
 - Coherent risk measures
 - Backtesting Value-at-Risk estimates
 - Variability Value-at-Risk estimates
- VI. Leverage, short sales, margin accounts (Bodie, Kane, Marcus 3.8, 3.9)
 - Margin account mechanics
 - Leverage risk on long positions
 - Risks in short positions. Short squeeze.
- VII. Derivative securities (McDonald 1-6, Bodie, Kane, Marcus 20-23, Jorion 7-8)
 - The role of derivatives in risk management
 - Forward, future, and option contracts
 - Insurance and risk management strategies
 - Put-Call parity
- VIII. Credit and counterparty risk (Malz 6.1-6.6)
 - Financial distress: default, ratings migration, insolvency and bankruptcy
 - Treatment of insolvency for financial firms
 - Counterparty risk
 - Forms of debt, capital structure and collateral
- IX. Operational risk (Jorion 25)
 - Famous cases: Barings 1995, SocGen 2008
 - Identifying, assessing, and mitigating operational risk
- X. Default analytics (Malz 7)
 - Hazard rates and default analytics

- Credit spreads and credit spread risk
- XI. Liquidity and leverage risk (Malz 12, Jorion 26)
 - Sources of liquidity risk: credit, maturity and liquidity transformation
 - Commercial banking and liquidity
 - Collateralized securities markets
 - Funding liquidity risk and risk management by financial firms
 - Financial distress: solvency and liquidity
 - Market liquidity risk and risk management
 - Defining and measuring leverage for the financial industry
 - Leverage risk and the attractions of leverage
 - Forms of leverage: carry trades and embedded leverage
- XII. Portfolio credit risk (Malz 8.1, 8.2, 8.4, 8.3, Jorion 29)
 - Overview of credit portfolio risk
 - Behavior of credit portfolios: credit diversification and default correlation
 - Default correlation in the single-factor model
 - Credit Value-at-Risk in the single-factor model
- XIII. Financial crises (Malz 14)
 - Banking, currency, and sovereign and external debt crises
 - Typical features of financial crises
 - Illiquidity and insolvency during crises
 - Bubbles, market crashes and financial crises
- XIV. Financial regulation (Malz 15, Jorion 28)
 - Organization of regulation: governments, central banks, and international coordination
 - Regulation and supervision of individual financial firms
 - Pitfalls of regulation
 - Concept of economic capital
 - Risk contributions
 - Evolution of capital standards