



Hunan University FINM 320: Risk Management and Derivatives

Instructor: To be announced

Credit: 4

Contact Hours

This course is composed of 24 lecture sessions, 3 tutorial sessions and 9 office contact hours(50minutes/contact hour). Each lecture session takes 2 contact hours in length; each tutorial session takes 3 contact hours in length;There will be a Q-A review session(3 contact hours) and Final Exam (3 contact hours)at the end of this term. This course has 72 contact hours in total.

Course Description

This course explains all aspects of financial risk as well as the way financial institutions are regulated, to help students better their understanding of financial markets and potential dangers. At the same time, this course features coverage of Basel 2.5, Basel III and Dodd-Frank as well as expanded sections on counterpart credit risk, central clearing and collateralization. This course also describes the activities of different types of financial institutions, explains how they are regulated and covers the market risk, credit risk, operational risk, liquidity risk and model risk, etc.

Textbook Information

Textbook: Risk Management and Financial Institutions

Author: John C. Hull

Edition: 3rd Edition

Publisher: Wiley

Grading

- Attendance 10%
- Quizzes 30%
- Homework 10%
- Midterm 20%
- Final Exam 30%

A+ 96-100	A 90-95	A- 85-89
B+ 82-84	B 78-81	B- 75-77
C+ 71-74	C 66-70	C- 62-65
D 60-61	F < 60	



Homework

Your success in this course is usually directly related to the effort you put into the homework assignments / quizzes.

Course Schedule

The course has 24 class sessions in total. All sessions are 2 contact hours in length. At the end of this term, there will be a Q-A review session(3 contact hours) and Final Exam (3 contact hours).

Note: the course outline and required readings are subject to change

Class 1:

CHAPTER 1 Introduction

- 1.1 Risk vs. Return for Investors
- 1.2 The Efficient Frontier
- 1.3 The Capital Asset Pricing Model
- 1.4 Arbitrage Pricing Theory
- 1.5 Risk vs. Return for Companies
- 1.6 Risk Management by Financial Institutions
- 1.7 Credit Ratings

CHAPTER 2 Banks

- 2.1 Commercial Banking
- 2.2 The Capital Requirements of a Small Commercial Bank
- 2.3 Deposit Insurance
- 2.4 Investment Banking
- 2.5 Securities Trading
- 2.6 Potential Conflicts of Interest in Banking
- 2.7 Today's Large Banks
- 2.8 The Risks Facing Banks

Class 2:

CHAPTER 3 Insurance Companies and Pension Plans

- 3.1 Life Insurance
- 3.2 Annuity Contracts
- 3.3 Mortality Tables
- 3.4 Longevity and Mortality Risk
- 3.5 Property-Casualty Insurance
- 3.6 Health Insurance
- 3.7 Moral Hazard and Adverse Selection
- 3.8 Reinsurance
- 3.9 Capital Requirements



3.10 The Risks Facing Insurance Companies

3.11 Regulation

3.12 Pension Plans

Class 3:

CHAPTER 4 Mutual Funds and Hedge Funds

4.1 Mutual Funds

4.2 Hedge Funds

4.3 Hedge Fund Strategies

4.4 Hedge Fund Performance

Class 4:

CHAPTER 5 Trading in Financial Markets

5.1 The Markets

5.2 Long and Short Positions in Assets

5.3 Derivatives Markets

5.4 Plain Vanilla Derivatives

5.5 Clearing Houses

5.6 Margin

5.7 Non-Traditional Derivatives

5.8 Exotic Options and Structured Products

5.9 Risk Management Challenges

Class 5:

CHAPTER 6 The Credit Crisis of 2007

6.1 The U.S. Housing Market

6.2 Securitization

6.3 The Crisis

6.4 What Went Wrong?

6.5 Lessons from the Crisis

Class 6:

CHAPTER 7 How Traders Manage Their Risks

7.1 Delta

7.2 Gamma

7.3 Vega

7.4 Theta

7.5 Rho

7.6 Calculating Greek Letters

7.7 Taylor Series Expansions

7.8 The Realities of Hedging

7.9 Hedging Exotic Options

7.10 Scenario Analysis

Class 7:



CHAPTER 8 Interest Rate Risk

- 8.1 The Management of Net Interest Income
- 8.2 LIBOR and Swap Rates
- 8.3 Duration
- 8.4 Convexity
- 8.5 Generalization
- 8.6 Nonparallel Yield Curve Shifts
- 8.7 Interest Rate Deltas in Practice
- 8.8 Principal Components Analysis
- 8.9 Gamma and Vega

Class 8:

CHAPTER 9 Value at Risk

- 9.1 Definition of VaR
- 9.2 Examples of the Calculation of VaR
- 9.3 VaR vs. Expected Shortfall
- 9.4 VaR and Capital
- 9.5 Coherent Risk Measures 190
- 9.6 Choice of Parameters for VaR
- 9.7 Marginal VaR, Incremental VaR, and Component VaR
- 9.8 Euler's Theorem
- 9.9 Aggregating VaRs
- 9.10 Back-Testing

Class 9:

CHAPTER 10 Volatility

- 10.1 Definition of Volatility
- 10.2 Implied Volatilities
- 10.3 Are Daily Percentage Changes in Financial Variables Normal?
- 10.4 The Power Law
- 10.5 Monitoring Daily Volatility
- 10.6 The Exponentially Weighted Moving Average Model
- 10.7 The GARCH(1,1) Model
- 10.8 Choosing Between the Models
- 10.9 Maximum Likelihood Methods
- 10.10 Using GARCH(1,1) to Forecast Future Volatility

Class 10:

CHAPTER 11 Correlations and Copulas

- 11.1 Definition of Correlation
- 11.2 Monitoring Correlation
- 11.3 Multivariate Normal Distributions
- 11.4 Copulas
- 11.5 Application to Loan Portfolios: Vasicek's Model



Class 11:

CHAPTER 12 Basel I, Basel II, and Solvency II

- 12.1 The Reasons for Regulating Banks
- 12.2 Bank Regulation Pre-1988
- 12.3 The 1988 BIS Accord
- 12.4 The G-30 Policy Recommendations
- 12.5 Netting
- 12.6 The 1996 Amendment
- 12.7 Basel II
- 12.8 Credit Risk Capital Under Basel II
- 12.9 Operational Risk Capital Under Basel II
- 12.10 Pillar 2: Supervisory Review
- 12.11 Pillar 3: Market Discipline
- 12.12 Solvency II

Class 12:

CHAPTER 13 Basel 2.5, Basel III, and Dodd–Frank

- 13.1 Basel 2.5 285
- 13.2 Basel III
- 13.3 Contingent Convertible Bonds
- 13.4 Dodd–Frank Act
- 13.5 Legislation in Other Countries

CHAPTER 14 Market Risk VaR: The Historical Simulation Approach

- 14.1 The Methodology
- 14.2 Accuracy
- 14.3 Extensions
- 14.4 Computational Issues
- 14.5 Extreme Value Theory
- 14.6 Applications of EVT

Class 13:

Midterm

Class 14:

CHAPTER 15 Market Risk VaR: The Model-Building Approach

- 15.1 The Basic Methodology
- 15.2 Generalization
- 15.3 Correlation and Covariance Matrices
- 15.4 Handling Interest Rates
- 15.5 Applications of the Linear Model
- 15.6 Linear Model and Options
- 15.7 Quadratic Model



- 15.8 Monte Carlo Simulation
- 15.9 Non-Normal Assumptions
- 15.10 Model-Building vs. Historical Simulation

Class 15:

CHAPTER 16 Credit Risk: Estimating Default Probabilities 347

- 16.1 Credit Ratings
- 16.2 Historical Default Probabilities
- 16.3 Recovery Rates
- 16.4 Credit Default Swaps
- 16.5 Credit Spreads
- 16.6 Estimating Default Probabilities from Credit Spreads
- 16.7 Comparison of Default Probability Estimates
- 16.8 Using Equity Prices to Estimate Default Probabilities

Class 16:

CHAPTER 17 Counterparty Credit Risk in Derivatives

- 17.1 Credit Exposure on Derivatives
- 17.2 Bilateral Clearing
- 17.3 Central Clearing 380
- 17.4 CVA
- 17.5 The Impact of a New Transaction
- 17.6 CVA Risk
- 17.7 Wrong Way Risk
- 17.8 DVA
- 17.9 Some Simple Examples

Class 17:

CHAPTER 18 Credit Value at Risk

- 18.1 Ratings Transition Matrices
- 18.2 Vasicek's Model
- 18.3 Credit Risk Plus
- 18.4 CreditMetrics
- 18.5 Credit VaR in the Trading Book

Class 18:

CHAPTER 19 Scenario Analysis and Stress Testing

- 19.1 Generating the Scenarios
- 19.2 Regulation
- 19.3 What to Do with the Results

Class 19:

CHAPTER 20 Operational Risk

- 20.1 What is Operational Risk?
- 20.2 Determination of Regulatory Capital



- 20.3 Categorization of Operational Risks
- 20.4 Loss Severity and Loss Frequency
- 20.5 Implementation of AMA
- 20.6 Proactive Approaches
- 20.7 Allocation of Operational Risk Capital
- 20.8 Use of Power Law
- 20.9 Insurance
- 20.10 Sarbanes-Oxley

Class 20:

CHAPTER 21 Liquidity Risk

- 21.1 Liquidity Trading Risk
- 21.2 Liquidity Funding Risk
- 21.3 Liquidity Black Holes

CHAPTER 22 Model Risk

- 22.1 Marking to Market
- 22.2 Models for Linear Products
- 22.3 Physics vs. Finance
- 22.4 How Models are Used for Pricing Standard Products
- 22.5 Hedging
- 22.6 Models for Nonstandard Products
- 22.7 Dangers in Model Building
- 22.8 Detecting Model Problems

Class 21:

CHAPTER 23 Economic Capital and RAROC

- 23.1 Definition of Economic Capital
- 23.2 Components of Economic Capital
- 23.3 Shapes of the Loss Distributions
- 23.4 Relative Importance of Risks
- 23.5 Aggregating Economic Capital
- 23.6 Allocation of Economic Capital
- 23.7 Deutsche Bank's Economic Capital

Class 22:

CHAPTER 24 Risk Management Mistakes to Avoid

- 24.1 Risk Limits
- 24.2 Managing the Trading Room
- 24.3 Liquidity Risk 514
- 24.4 Lessons for Nonfinancial Corporations 517
- 24.5 A Final Point

Class 23:

Analysis and Discussion



Class 24:
Overall Review

Attending Policy

Regular and prompt attendance is required. Under ordinary circumstances, you may miss two times without penalty. Each absence over this number will lower your course grade by a third of a letter and missing more than five classes may lead to a failing grade in the course. Arriving late and/or leaving before the end of the class period are equivalent to absences.

Policy on “Late Withdrawals”

In accordance with university policy, appeals for late withdrawal will be approved **ONLY** in case of medical emergency and similar crises.

Academic Honesty

All students are expected to do their own work. Instructors will fail assignments that show evidence of plagiarism or other forms of cheating, and will also report the student's name to the University administration. A student reported to the University for cheating is placed on disciplinary probation; a student reported twice is suspended or expelled.

Final Assignment

When a student cheats in a major or final assignment such as a comprehensive examination or presents plagiarized material in a major or final assignment, that student shall receive an F in that particular subject. Student cheats on more than two exams shall be dismissed from HNU.

General Expectations

Students are expected to:

- Attend all classes and be responsible for all materials covered in class and otherwise assigned;
- Complete the day's required reading and assignments before class;
- Review the previous day's notes before class and make notes about questions you have about the previous class or the day's reading;
- Participate in class discussions and complete required written work on time;
- Refrain from texting, phoning or engaging in computer activities unrelated to class during the class period;
- While class participation is welcome, even required, you are expected to refrain from private conversations during the class period.

Special Needs or Assistance

Please contact the Administrative Office immediately if you have a learning disability, a medical



issue, or any other type of problem that prevents professors from seeing you have learned the course material. Our goal is to help you learn, not to penalize you for issues which mask your learning.