Financial Risk Management
Module II, 2017-2018

Course Information

Instructor: Lu, Jun (Timothy)
Office: PHBS Building, Room

Phone: 86-755-2603- 5290
Email: junlu@phbs.pku.edu.cn
Office Hour: Tue & Fri 15:30—17:30

Teaching Assistant: Ruan, Yingyi (Wendy)
Phone:
Email: 1701213773@sz.pku.edu.cn

Classes:
Lectures: Tue & Fri 13:30—15:20
Venue: PHBS Building, Room 229

Course Website:
Register on cms.phbs.pku.edu.cn, and search for the course Financial Risk Management (FRM_FALL2017).

1. Course Description

1.1 Context

Course overview:

This course is designed to apply the theories and methodologies to the complex needs of managing financial risk in financial institutions. With the development of the financial market and the current financial crisis, it is extremely important for today's financial professionals to understand the types of financial risks that they are facing. This course will introduce several risk management models to measure and manage various types of risks, including equity risk, interest-rate risk, credit risk, and liquidity risk. We develop and critique theoretical models for each type of risk, while emphasis is strongly placed on the implementation of the models. Furthermore, we relate this course to the ongoing financial crisis by discussing the measurements and tests of risk. The course is intended for students who consider a career in the financial industry.

Prerequisites:

Students are required to have basic knowledge of finance, probability and statistics, and working knowledge of Excel.

1.2 Textbooks and Reading Materials

John C. Hull, *Risk Management and Financial Institutions: 3rd Edition*, Wiley, 2012

Other course notes and readings.

Note: The textbook covers a broad range of risk management concepts and tools, and serves as a good reference of the course. However, the course will cover many topics and techniques that are not in the textbook. Hence, class attendance is highly recommended.

2. Learning Outcomes

2.1 Intended Learning Outcomes

Learning Goals	Objectives	Assessment (YES with details or NO)
1. Our graduates will be effective communicators.	1.1. Our students will produce quality business and research-oriented documents.	
	1.2. Students are able to professionally present their ideas and also logically explain and defend their argument.	
2. Our graduates will be skilled in team work and leadership.	2.1. Students will be able to lead and participate in group for projects, discussion, and presentation.	Yes, students will be assigned a group project.
	2.2. Students will be able to apply leadership theories and related skills.	
3. Our graduates will be trained in ethics.	3.1. In a case setting, students will use appropriate techniques to analyze business problems and identify the ethical aspects, provide a solution and defend it.	
	3.2. Our students will practice ethics in the duration of the program.	
4. Our graduates will have a global perspective.	4.1. Students will have an international exposure.	Yes, examples in the global markets will be presented throughout the course.
5. Our graduates will be skilled in problem-solving and critical thinking.	5.1. Our students will have a good understanding of fundamental theories in their fields.	Yes, theories will be presented and critiqued.
	5.2. Our students will be prepared to face problems in various business settings and find solutions.	Yes, examples of various risk management practices will be presented.
	5.3. Our students will demonstrate competency in critical thinking.	Yes, critiques of theories and practices will be carried out throughout the course.

2.2 Course specific objectives

Upon completion of this course, students will be able to:
- Develop problem-solving and critical thinking skills in financial risk management
- Develop teamwork habit and skills by completing a group project
- Dynamically hedge trading risks, utilizing financial derivatives
- Summarize the equity risk exposure using simulation and various measures of risk including Value-of-Risk
- Test the accuracy of risk models, including EWMA and GARCH models
- Understand dependence measures (copulas) beyond linear correlation and its importance for portfolio risk
- Provide a detailed description of the meaning and interpretation of the output from these models using the terminology and concepts of risk management
- Make and evaluate recommendations related to a firm's equity, interest rate, and credit risk management programs

2.3 Assessment/Grading Details

Grading of this course will be based on a final exam, a mid-term exam, and a group project:

1. Group project (30%)
2. Mid-term exam (30%)
3. Final exam (40%)

2.4 Academic Honesty and Plagiarism

It is important for a student's effort and credit to be recognized through class assessment. Credits earned for a student work due to efforts done by others are clearly unfair. Deliberate dishonesty is considered academic misconducts, which include plagiarism; cheating on assignments or examinations; engaging in unauthorized collaboration on academic work; taking, acquiring, or using test materials without faculty permission; submitting false or incomplete records of academic achievement; acting alone or in cooperation with another to falsify records or to obtain dishonestly grades, honors, awards, or professional endorsement; or altering, forging, or misusing a University academic record; or fabricating or falsifying of data, research procedures, or data analysis.

All assessments are subject to academic misconduct check. Misconduct check may include reproducing the assessment, providing a copy to another member of faculty, and/or communicate a copy of this assignment to the PHBS Discipline Committee. A suspected plagiarized document/assignment submitted to a plagiarism checking service may be kept in its database for future reference purpose.

Where violation is suspected, penalties will be implemented. The penalties for academic misconduct may include: deduction of honour points, a mark of zero on the assessment, a fail grade for the whole course, and reference of the matter to the Peking University Registrar.

For more information of plagiarism, please refer to PHBS Student Handbook.

3. Topics, Teaching and Assessment Schedule

Class 1 - 9: Equity Risk Management
- Risk model for asset and portfolio returns, sample estimates, normally distributed returns
- No-arbitrage asset pricing, including one-period and multi-periods

- Forwards, futures, and swaps
- Front office trading risk management, including Delta and Gamma hedging (Chapter 7)
- Risk measures, including VaR and expected shortfall (Chapter 9)
- Time-dependent volatility models, including GARCH, parameter estimation through Maximum Likelihood Method (Chapter 10)
- Correlations and Copulas (Chapter 11)
- Monte Carlo simulation, bootstrapping, and Cholesky factorization (Chapter 14 & 15)

Class 10: Mid-term Exam in class (December 19, 2017).

Class 11 - 13: Interest-rate Risk Management (Chapter 8)
- Overview of fixed income securities
- Derivation and application of term-structure models, including Ho & Lee model, and Heath, Jarrow, & Merton model
- Duration and convexity
- Yield curve shifts

Class 14 - 16: Credit Risk Management
- Overview of credit risk
- Derivation and application of credit risk models, including Merton's model, and Jarrow & Turnbull's model
- Credit default swaps (CDS), CDS spreads, risk neutral valuations (Chapter 16)
- Credit risk mitigation, credit risk VaR, Moody's KMV, and Vasicek's model (Chapter 17 & 18)

Class 17 - 18: Liquidity Risk, and the Financial Crisis
- Liquidity risk (Chapter 21)
- Understanding the credit crunch of 2007 (Chapter 6)
- Regulation, Basel II, Basel III, and Dodd-Frank (Chapter 13)
- Stress testing (Chapter 19)

4. Miscellaneous