Advanced risk management

Academic Year: (2017 / 2018) **Review date: 13-11-2017**

Department assigned to the subject:

Coordinating teacher: PEÑA SANCHEZ DE RIVERA, JUAN IGNACIO

Type: Electives ECTS Credits : 3.0

Year : 1 Semester : 2

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Target Audience: This course is useful for any student in the master (she could be an Economics, Engeniering, Math, Physics or from Business Administration bachelor). The courses of Computer Science for Finance(Matlab), Financial Markets, Financial Derivatives, Risk Management and Investment should have been completed previously.
The empirical exercises will be done using Matlab and only in some cases in Excel.

OBJECTIVES

This course is designed to train the participants in managing financial risks and specially credit and operational risks using advanced methods. First the main points related with why and how should firms hedge are addressed. Then the course then focuses on credit risks and its measure (CVaR) and how to deal with it using credit derivatives. The emphasis of the course is on modelling and measuring financial risk. The course deals with credit (corporate and sovereign) and operational risks. The course draws heavily on financial theory. In addition, the disciplines of econometrics and statistics are heavily used to formulate and solve the problems faced by risk managers.

PROFESSOR: Beatriz Balbas (University of Alcala)

DESCRIPTION OF CONTENTS: PROGRAMME

Chapter 1: Credit Background and Traditional Credit Instruments
-Credit Debt vs Risk-Free Debt
-Default and Recovery Data
-Transition Matrices: calibration with Matlab
-Credit Portfolio and Portfolio Risk: VaR and counterparty VaR

Chapter 2: Credit Derivatives Concepts
-Introduction to Credit Derivatives
-CDS Product Definition and Documentation
-CDS Application and Elementary Strategies
-The Fundamental Credit Arbitrage ¿ Repo Cost
-Default and Recovery Model Claim Amount

Chapter 3: Credit Derivatives: Valuation and Risk
-Deterministics Default Rate Models
-Stochastic Default Rate Models: Hazard and Pseudo-Hazard Rates
-Calibration to Market Data with Matlab
-CDS Deal Examples
-CDS/Bond Basis Trading

Chapter 4: Credit Derivatives: Portfolio Products
-Nth-to-default Baskets: Synthetic CDOs, Cashflow CDOs and Alternative Leverd Credit Portfolio Products
-The normal Copula and Correlation
-Valuation and hedging (with Matlab).

Chapter 5: Introduction to Operational Risk
-Definition of operational risks:
-Internal risks: system failures, theft, fraud, and mistakes
-External risks: weather events, accidents, and terrorism

-Measuring Operational VaR

LEARNING ACTIVITIES AND METHODOLOGY

Students will work in teams, learning to collaborate and organize the different roles in the team.
In addition, the Professor will present the main theoretical concepts using Power Point presentations just before students do the cases or exercises.
In every lesson or topic, students will work in a practical exercise (similar to the case but easier) during the lesson in order to learn the main concepts and apply them to a practical problem.
Every case is based on real data coming from financial markets.
Students must present a report for the case 1 and 2 what provides them the ability to write profesional reports (using the same structure as an Academic paper).

ASSESSMENT SYSTEM

Students will take a final examination. The final examination will count 60 points; the exercises (problems and cases) and class participation will count for 40 points.

% end-of-term-examination:	60
% of continuous assessment (assigments, laboratory, practicals…):	40

BASIC BIBLIOGRAPHY

- Crouhy, M. , D. Galai and R. Mark The Essentials of Risk Management, Wiley, 2014
- John Hull Options, Futures, and Other Derivatives, Pearson Prentice Hall, 2011
- Jorion, P. Financial Risk Manager Handbook, Wiley. , (2011) . 6th Edition