Risk Management

Academic Year: (2022 / 2023) **Review date: 02-08-2022**

Department assigned to the subject: Business Administration Department

Coordinating teacher: PEÑA SANCHEZ DE RIVERA, JUAN IGNACIO

Type: Compulsory ECTS Credits : 6.0

Year : 2 Semester : 1

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Finance I and Finance II, Mathematics and Econometrics
Programming skills in Matlab o similar language are recommended

OBJECTIVES

We design this course to train the participants in evaluating and measuring financial risks. The course starts with an analysis of matrix and risk profiles. Then the main points related to why and how firms should hedge are addressed. We discuss Basel capital accords. After making sure that the participants know how to compute and backtest Value-at-risk (VaR) and Expected Shortfall (ES) for portfolios exposed to market risk, the course turns to credit risks and their measurement (CVaR). We discuss how to manage credit risk using credit derivatives. The program ends with a review of operational risk measures (OVaR) and implementation issues.
The emphasis of the course is on modeling and measuring financial risk. The course deals with the interest rate, exchange rate, commodity price, equity, credit, and systemic and operational risks. The course draws heavily on mathematics and financial theory. Also, the contents rely heavily on econometrics and statistics, which we use to formulate and solve the problems faced by risk managers. The course requires command of Matlab and, especially, LiveScripts.

DESCRIPTION OF CONTENTS: PROGRAMME

PROGRAM:

Chapter 1: Introduction

- What is this course about?
- What is financial risk?
- Risk evaluation, measurement, and management
- Risk profile
- Hedging risk: vanilla derivatives and ETF
- Assignment #1

Chapter 2: Risk Management and Firm Value

- Why should firms hedge?
- Diversification and risk management.
- Creating value with risk management: bankruptcy costs, taxes, investment opportunities.
- Optimal capital structure and risk management
- How should firms hedge?
- Optimal hedging strategies

Chapter 3: International Capital Accords

- Why banking regulation?
- Banking regulation tools
- Financial Risks: The Basel Framework
- Basel I, II, III, IV¿.

- The limitations of conventional banking regulation

Chapter 4: Market Risk

- Risk measures
- Value-at-Risk (VaR)
- Expected Shortfall (ES)
- Forecasting and Backtesting VaR
- Forecasting and Backtesting ES
- Model Risk
- Stress testing
- Assignment #2

Chapter 5: Credit Risk

- Retail credit risk
- Corporate credit risk
- Estimating default probabilities
- Measuring Corporate Default
- Portfolio loss distribution
- RAROC
- CVA
- Credit Risk VaR

Chapter 6: Credit Derivatives

- Credit Transfer Markets
- What is a Credit Derivative?
- Credit Default Swap
- CDS Index
- Total Return Swap
- Credit Spread Option
- Collateralized Debt Obligations (CDO)

Chapter 7: 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

Regular class, case discussions and individual presentations

ASSESSMENT SYSTEM

Course requirements:
Practices and Assignments: 60 points
Groups (maximum four persons)
Practice session PDF reports : 12 x 3 = 36 points
Assignment 1: 12 points
Assignment 2: 12 points
Individual Final Exam: 40 points.

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

BASIC BIBLIOGRAPHY

- Christoffersen, P.F. Elements of Financial Risk Management, Academic Press., (2012)
- Crouhy, M. , D. Galai and R. Mark The Essentials of Risk Management, Wiley, (2014)
- Jorion, P. Financial Risk Manager Handbook., Wiley, (2011)
- McNeil, A.J., R. Frey and P. Embrechts Quantitative Risk Management. , Princeton University Press., (2005)