

## Risk Management

Academic Year: ( 2021 / 2022 )

Review date: 05-12-2020

Department assigned to the subject:

Coordinating teacher: MAYORAL BLAYA, SILVIA

Type: Compulsory ECTS Credits : 3.0

Year : 1 Semester : 2

## REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Students should have passed Derivatives, Financial Markets and Fixed Income courses.

Professor:

Raquel Bujalance - Head of ALM Models (Santander Analytics)

## OBJECTIVES

This course introduces the different types of risk financial entities face, with a special focus on market and liquidity risks, and the guidelines that they follow to properly manage them.

Students will learn different hedging techniques and assess the market risk of a portfolio with the traditional measures used in the industry (Value at Risk and Expected Shortfall), understanding their differences and limitations and testing their accuracy through backtesting analysis.

In addition to managing the risk of a portfolio, the course provides an overview of how the structural risk is managed in financial entities, focusing on liquidity risk metrics (survival horizon, maturity gap) and interest rate risk metrics (repricing gap, market value of equity, net interest margin, duration gap).

Finally and given the increasingly important role of regulators in the banking industry, the course summarizes the current European regulatory framework: players and requirements related to both liquidity and interest rate risks.

## DESCRIPTION OF CONTENTS: PROGRAMME

## 1-Introduction to Risk Management

Types of Risk

Approaches to Risk Management

Risk Management Failures

Regulatory Framework

## 2-Hedging Risks

Introduction

Option Greeks and Hedging Strategies

Hedging Strategies with Derivatives

Portfolio Insurance

## 3-Market Risk I

Introduction

Measure at Risk

- VaR
- ES
- Coherent risk measure

Strengths and Limitations

## 4- Market Risk II

Methodologies

- Analytical
- Historical Simulation
- Monte Carlo Simulation

Strengths and Limitations

## 5- Market Risk III

Backtesting

Stress Testing  
Regulatory Framework: FRTB

6- Balance Sheet Management I  
Introduction to ALM (Asset and Liabilities Management)  
IRRBB: Interest Rate Risk in the Banking Book  
Calculation Methods  
Risk Monitoring and Stress Test  
Regulatory Framework: EBA Guidelines IRRBB

7- Balance Sheet Management II  
Liquidity Risk  
Calculation Methods  
Risk Monitoring and Stress Test  
Regulatory Framework: EBA Guidelines LCR y NSFR

#### LEARNING ACTIVITIES AND METHODOLOGY

Theoretical concepts will be presented using slides that will be available before each lecture.  
To be consistent with GARP rules for the FRM exams, students must demonstrate their ability to solve problems and exercises by using just a calculator in both the mid-term and the final exam. In addition, students will solve two different assignments in Excel and Matlab in which they will have to calculate some risk metrics of a portfolio of assets (VaR, ES) using real data.

#### ASSESSMENT SYSTEM

The grade will be based on a closed-book final exam (50%) and on coursework (50%). To pass the course, students must hand in the coursework and get a minimum grade of 4 out of 10 in the final exam, which will have a duration of 1-2 hours.

- % end-of-term-examination: 50
- % continuous assessment (two assignments): 50

Students that do not meet the minimum passing grade should retake the subject. If the resit is taken, the above grade criteria also apply

<b>% end-of-term-examination:</b>	50
<b>% of continuous assessment (assignments, laboratory, practicals...):</b>	50

#### BASIC BIBLIOGRAPHY

- John C. Hull Options, futures, and other derivatives, Prentice Hall , 2012
- Philippe Jorion Financial Risk Manager Handbook, Wiley Finance, 2009

#### ADDITIONAL BIBLIOGRAPHY

- Kevin Dowd Measuring Market Risk., West Sussex, UK: John Wiley & Sons., 2005
- Linda Allen, Jacob Boudoukh and Anthony Saunders Understanding Market, Credit and Operational Risk: The Value at Risk Approach., New York, NY: Wiley-Blackwell, 2004
- Philippe Jorion Value at Risk. The New Benchmark for Managing Financial Risk, McGraw-Hill, 2007