

Academic Year: ( 2019 / 2020 )

Review date: 29-04-2020

Department assigned to the subject:

Coordinating teacher: SERRANO JIMENEZ, PEDRO JOSE

Type: Electives ECTS Credits : 3.0

Year : 1 Semester : 2

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

No previous knowledge of commodities markets will be assumed, although familiarity with derivatives such as futures and forward contracts and vanilla options will help to follow the sessions. Therefore, it is expected student have study the Derivatives course.

**OBJECTIVES**

The course provides an overview of commodities markets with a focus on energy markets. Students will learn not only the main characteristics and determinants of commodities markets and commodities futures prices but also how to employ financial techniques (risk management, valuation and investment analysis) into the context of commodities markets. Students will also see with practical examples how these techniques are applied in real life into energy companies, achieving skills to manage large database and work with real empirical problems.

**DESCRIPTION OF CONTENTS: PROGRAMME**

Structure of the course: There will be a total of seven sessions. The main professor of the course will be Santiago Pellegrini, who will teach 6 sessions. The other session will be taught by another practitioner with deep experience on energy markets and risk management.

Faculty:

\* Prof. Santiago Pellegrini (Head of Risk Modeling at Repsol, PhD)

\* Prof. Pablo Villaplana (Chief Operating Officer, OMIClear)

**1. INTRODUCTION TO COMMODITIES MARKETS. ANALYSIS OF FORWARD CURVES**

- Understanding basic types of commodities: energy (natural gas, coal, oil, electricity, CO2 emission rights), soft (coffee, sugar, cocoa, cotton), industrial metals (copper, aluminium, zinc), precious metals (gold, silver), grains and life stock (corn, wheat, soybeans, hogs, cattle).
- Commodities forward curves idiosyncrasies: understanding contango, backwardation, seasonality; risk premium and convenience yield.
- Electricity market and interrelationships between commodities: dark and spark spread, clean dark and clean spark spread.

**2. RISK MANAGEMENT AND VALUATION COMMODITIES FUTURES. RISK MANAGEMENT IN THE NON-FINANCIAL SECTOR**

- Risk management definition and objective. Benefits of risk management. Main determinants of risk management. Why should firms in the non-financial sector manage risk?
- Financial Risk Measures (application to the energy sector): VaR, CFaR
- Risk management in independent retail companies: practical example

**3. COMMODITIES AS AN ASSET CLASS. (I)**

- Portfolio decisions with and without commodity instruments: the role of commodities in risk diversification. Benefits and disadvantages of adding commodities to a portfolio.
- Efficient Frontier of Commodity Portfolios
- Strategic Asset allocation and commodities.
- Commodities indices
- Correlation between financial and commodities markets. Role of speculators .Recent developments in the regulation of commodities and financial markets.

**4. REAL OPTIONS I**

- Introduction to Real Options

- Basic types of Real Options
- Valuation of Real Options: binomial model
- Valuation of physical assets as Real Options: Power Plant, Gas Storage, Interconnector;

#### LEARNING ACTIVITIES AND METHODOLOGY

The course will be structured around lecturing sessions, sessions given by the practitioners and presentations made by the students. Reports published by investment banks will be used as material for the presentations to be made by the students in groups. Students will work in teams, learning to collaborate and organize the different roles in the team.

#### ASSESSMENT SYSTEM

The following criteria will be taken into account to determine the grades:

- Homework/s: 25%
- Midterm Exam (multiple choice): 25%
- Exam (closed book exam with calculator): 50%

A minimum grade of 4.0 in the final exam is required in order to pass the course.

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

- CAIA Association, Hossein Kazemi, Keith H. Black, Donald R. Chambers Alternative Investments: CAIA Level II, Wiley, 2016
- Donald R. Chambers, Mark J. P. Anson, , Keith H. Black, Hossein Kazemi Alternative Investments: CAIA Level I, Wiley, 2015
- John Hull Options, Futures and other derivatives, Wiley Finance, 2011

#### ADDITIONAL BIBLIOGRAPHY

- Fabozzi, F., Fuss, R. and Dieter, G. K. Handbook of Commodity Investing, Wiley, 2008