

## Investment

Academic Year: ( 2017 / 2018 )

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Department assigned to the subject:

Coordinating teacher: MORENO MUÑOZ, JESUS DAVID

Type: Compulsory ECTS Credits : 6.0

Year : 1 Semester : 1

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

The course presumes some exposure to undergraduate finance, economics, statistics and econometrics. In addition, knowledge of Matlab programming is required to do one of the practical exercises. Basic knowledge in Matlab and Excel are required.

## OBJECTIVES

This course provides a rigorous panoramic analysis of the interplay between portfolio selection, asset pricing theory, and the empirical evidence. Firstly, we present the main asset pricing models including the CAPM, multi-factor asset pricing models, and conditional models. Secondly, we introduce the main concepts on Portfolio Management and the mean-variance model. Thirdly, a complete description of Investment Companies (mutual funds, hedge funds, among others) and the most relevant performance measures are studied. Students will learn how to create and evaluate a portfolio. Finally, the restrictions of the mean-variance framework are pointed out and potential improvements are suggested. This course combines both theoretical foundations and practical exercises using real data from financial markets or mutual funds industry.

Professors of the Course:

1- Belen Nieto (Associate Professor University of Alicante, PhD)

2- David Moreno (Associate Professor University Carlos III, PhD)

## DESCRIPTION OF CONTENTS: PROGRAMME

First Part: Professor Belen Nieto

## 1- Foundations of Asset Pricing

- Descriptive statistics of Asset Returns
- Investor Preferences
- The Fundamental Pricing Equation
- Expected Utility and the Stochastic Discount Factor

## 2- Factor pricing (I): The Capital Asset Pricing Model

- The model
- The SDF representation
- Testing the model
- Time varying expected returns and predictability
- The conditional CAPM

## 3. Factor Pricing (II): Multifactor Asset Pricing Models

- Introduction to multifactor models
- The Size and Value factors
- The Momentum factor
- The Investment and Profitability factors
- The Quality factor

#### 4. Asset Pricing and Frictions

- Liquidity
- Liquidity risk
- Funding Liquidity risk

### Second Part: Professor David Moreno

#### 1. Mean-Variance Efficient Frontier

- Descriptive statistics of asset returns
- Expected return and risk on a portfolio
- Diversification attending to correlation coefficient
- The Markowitz Model
  - The Efficient Frontier
  - The Efficient Frontier with a risk-free asset

#### 2. Investment Companies

- Introduction to Investment Companies
- Description of main ICs (Mutual Funds, ETF, Closed-Funds)
- Pricing Mutual Funds

#### 3. Performance Measures and Mutual Funds Evaluation

- Traditional Performance Measures
- Performance measures based on APT
- Conditional Performance Evaluation
- Performance measures based on Portfolio Holdings
- Market Timing Ability
- Other Performance Measures used by practitioners.
- Performance Measurement of Hedge Funds

#### 4. Drawbacks of Mean-Variance model and potential improvements

- Main problems of Mean-Variance in practice
- Resampled Efficient Frontier (Michaud, 1998)
- Robust Portfolio Optimization and Bayesian Models (Shrinkage estimators)
- Non-normal return distributions: Optimizing Downside Risk
- Back and Littermann Model

#### 5. Other Topics in Portfolio Management

- Behavioral Finance
- Value Investing Philosophy
- Technical Analysis
- Non-traditional assets

### LEARNING ACTIVITIES AND METHODOLOGY

The theoretical contents are presented using Power Point slides. In all classes empirical exercises will be solved, most of them using real data, with the aim of a practical application and visualization of theoretical concepts. The students will work in teams and using computers. The software used will be Excel and Matlab.

Practical application on Portfolio Choice:

With real data about individual asset returns, the student will have to obtain:

- The mean-variance efficient frontier without riskless asset.
- The minimum variance portfolio.
- The tangent portfolio and the efficient frontier with a riskless asset.
- The optimal investor portfolio for different levels of risk aversion.
- The mean-variance efficient frontier for the stochastic discount factor.
- Resampling Efficient Frontier
- Optimal asset allocation under Black-Litterman model

Practical application on Asset Pricing:

With real US market data, students must have to discuss:

- Testing the CAPM

- Estimating the Multifactorial model of Carhart
- The performance of mutual funds using Jensen's alpha
- The performance of alternative multifactor asset pricing models.

## ASSESSMENT SYSTEM

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

Students will solve problems and empirical exercises with real data that could have a weight of 30% in the final grade. Another 10% comes from a Midtem Exam in Matlab. Students will have to read a special topic on Portfolio Management (Value Investing, Technical Analysis, Behavioral Finance, etc) and do a public presentation (10% grade). The rest 50% will come from the final exam (which has a 40% weight from Matlab and 60% of written exam).

All students must obtain at least 4 out of 10 points in the final exam to take into account the 50% of the grade from the exercises. Otherwise, the final grade will completely be based on the final exam.

## BASIC BIBLIOGRAPHY

- Andrew Ang Asset management: A systematic Approach to Factor Investing, Oxford University Press, 2014
- Bernd R. Fischer, Russ Wermers Performance Evaluation and Attribution of Security Portfolios, Academic Press, 2013
- Bodie, Kane and Marcus Investments, McGraw Hill, 2012
- Lasse Heje Pedersen Efficiently inefficient, Princeton University Press, 2015