Financial Econometrics

Academic Year: (2021 / 2022) **Review date: 09-07-2020**

Department assigned to the subject: Statistics Department

Coordinating teacher: RUIZ ORTEGA, ESTHER

Type: Electives ECTS Credits : 6.0

Year : 4 Semester :

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Statistics I
Statistics II
Econometrics I
Econometrics II

OBJECTIVES

After this course, the student will know how to measure the volatility of a financial asset. Furthermore, he will know how how to use the volatility to construct prediction intervals for the return of an asset taking into account whether the market has a high or low volatility in the moment when the prediction is made. For this purpose, GARCH and Stochastic Volatility models will be studied.
The student will also learn how to obtain correlations between financial assets that possibly are time-varying. Measuring these correlations are cruzial for portfolio formation models. The estimation of the correlations will be carried out through the implementation of multivaritate GARCH models. Furthermore, different econometric models will be implemented to test for different financial theories as, for example, testing for market efficiency or for estimating the Value at Risk of a given asset.

Transversals: Interpretation of financial data. Using software designed for financial data analysis.

DESCRIPTION OF CONTENTS: PROGRAMME

Chapter 1 DYNAMIC DATA: PROPERTIES AND LINEAR MODELS
1.1 Properties of dynamic data: dependence and evolution
1.2 The autocorrelation funacion: liear dependence of financial returns
1.3 Differences between the marginal and conditional distributions: Are returns Normal?
1.4 Linear and non-linear models
1.5 ARMA models for conditional means
1.6 Efficiency tests in financial markets

Chapter 2 UNIVARIATE GARCH MODELS
2.1 Empiric properties of financial returns: Euribor, IBEX35, ¿/$, ¿/£, ¿/Yuan. The role of observation frequency
2.2 ARCH(1) model: properties
2.3 GARCH(1,1) model: properties
2.4 IGARCH model: Riskmetrics
2.5 Asymmetric response of volatility: EGARCH(1,1) model
2.6 GARCH-M model
2.7 Estimation and forecasting of volatility. Constructing forecast intervals for financial returns
2.8 Computing the value at risk of stocks

Chapter 3 MULTIVARIATE GARCH MODELS
3.1 Properties of multivariate financial data
3.2 Multivariate GARCH models: problems
3.3 BEKK model
3.4 CCC model
3.5 Correlations among financial stocks: portfolio management
3.6 Temporal structure of interestrates

LEARNING ACTIVITIES AND METHODOLOGY

The course will have a presential part in the classroom where the blackboard and audiovisual tools will be used (3 ECTS). Furthermore, the computer rooms will be used for the tutorials where the students will learn how to used the software appropriate to implement alternative models to real data (3 ECTS).

ASSESSMENT SYSTEM

60% of the final mark will be assesed with a final examination. 40% of the final mark will depend on the marks of two partial exercices.
For the continuous evaluation to be considered it is necessary to obtain at least 5 points in the final exam.

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

BASIC BIBLIOGRAPHY

- Gloria González-Rivera Forecasting for Economics and Business, Prentice Hall, 2013
- R. Tsay Analysis of Financial Time Series, Wiley, 2010
- S.J. Taylor Modelling Financial Time Series, World Scientific Publishing, 2008