Prediction Techniques

Academic Year: (2023 / 2024)   **Review date: 24-04-2023**

Department assigned to the subject: Statistics Department

Coordinating teacher: LOPES MOREIRA DA VEIGA, MARIA HELENA

Type: Electives ECTS Credits : 6.0

Year : 4 Semester :

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Previous courses on Statistics and Econometrics.

OBJECTIVES

This course requires having an intermediate knowledge of Statistics and of the regression model, but does not require previous knowledge on Time Series. The course is centered on forecasting time series economic variables, referred to firms, economic sectors or at macroeconomic level. The course has been designed with the aim that the students obtain   a satisfactory initial knowledge of Time Series Econometrics for economic forecasting including the following aspects.

1.The use of forecasts in decision-taking processes within the firm.

2.The main stylized facts of time series economic variables: trends, seasonality, serial correlation, conditional volatility, innovations.

3.Differences between firm variables according with the above stylized facts and with the different aims of the firm in forecasts at short, medium and long-term level.

4.Forecasting with univariate models for: A) variables with deterministic trend and seasonality; B) variables with stochastic trends and seasonalities; C) forecasting with dynamic regression models.

5.The application of the above models in forecasting real data.

BYPRODUCTS. Learning to face the solution of problems using real data. Knowledge of software for forecasting. Use of forecasting in firms.

DESCRIPTION OF CONTENTS: PROGRAMME

1.- Importance of economic forecasting and determinants of prediction methods

1.1 Dynamic context of the business activity

1.2 Importance of economic forecasting

1.3 Forecasting and business intelligence in the firm

1.4 The forecasting uncertainty

1.5 Time series forecasting

2. Modelling and Prediction with deterministic trend and seasonal structures

2.1 Revision of previous topics: Trend and business cycles

2.2 Forecasting with models with deterministic trends and seasonality. Confidence intervals.

3. Prediction using time series models

3.1 Forecasting with AR model. Examples

3.2 Forecasting with ARI models

4. Prediction of dynamic regression models

4.1 The ADL model

4.2 Forecasting with ADL models

5. Prediction with VAR and VECM models

5.1 Recursive VAR models

5.2 VECM models

6. The prediction as a basis for economic diagnoses.

6.1 Successful examples of economic forecasting

LEARNING ACTIVITIES AND METHODOLOGY

Theoretical support material on the web and with connection to international data bank signed by the UC3M classes. Practical problem-solving classes, with additional problems on the web and its resolutions. Computer classes in computer classroom practices. Making a simple prediction project with teacher supervision. The project requires that the student has acquired   adequate level using E-Views for the construction of econometric models and their application to predict knowledge. The project must

be made exclusively by the student. Oral presentations of progress on projects with discussions among students. Daily five-minute discussion about what is learned in the course is relevant and can be used in the context of economic news.

ASSESSMENT SYSTEM

65% of the final grade will be obtained with the project, 30% through a final exam evaluation and the remaining 5% will be achieved through assessments throughout the course, with the resolution of the problems of the practical classes and participation in daily newswire current discussions related to the course. The final exam and assessments throughout the course will be conducted with books and notes. The project will be defended orally in class. If the project includes sections that students can not explain, the rating of the project is suspended. In case the student does not carry out continuous evaluation, the ordinary call exam will have a weight of 60%.
To pass the course is essential to take a 5 out of 10 in the final exam.

% end-of-term-examination: 30

% of continuous assessment (assigments, laboratory, practicals…):   70

BASIC BIBLIOGRAPHY

 - Diebold, F.X. Elements of forecasting, South-Western College Publishing, Cincinnati, 2004

 - Espasa, A. y Cancelo, J.R Métodos Cuantitativos para el Análisis de la Coyuntura Económca, Alianza Editorial, 1993
 - Gonzalez-Rivera, G. Forecasting for Economics and Business, Pearson, 2013

 - Granger, C.W.J. Forecasting in Business and Economics, Academic Press, San Diego, 1989

 - Peña, D. Análisis de Series Temporales, Alianza Editorial, 2005