SUBJECT TEACHING GUIDE

G911 - Economic Forecasting

Degree in Business Administration and Management

Academic year 2023-2024

1. IDENTIFYING DATA				
Degree	Degree in Business Administration and Management		Type and Year	Optional. Year 4
Faculty	Faculty of Economics and Business Studies			
Discipline	Subject Area: Econometric Models			
Course unit title and code	G911 - Economic Forecasting			
Number of ECTS credits allocated	6	Term	Semester based (2)	
Web				
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. ECONOMIA
Name of lecturer	JOSE LUIS GALLEGO GOMEZ
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Other lecturers	

3.1 LEARNING OUTCOMES
- To understand the role that economic forecasting plays when making decisions under uncertainty.
- To master the most relevant prediction methods used in Economics and Business.
- To get experience using prediction methods.
- To gain skills to manage specialized software for forecasting.
- Ability to produce advisory reports useful in decision making.
- Ability to work in a team developing a system of forecasting and monitoring of an economy or business.

4. OBJECTIVES
To explain the basics of the time series analysis and the forecasting methods.
To describe the practical implementation of prediction methods.
To give practical advice on the application of prediction methods.

6. COURSE ORGANIZATION	
CONTENTS	
1	Elements of forecasting.
1.1	Objectives and strategies in business and economic forecasting. Stylized facts of economic time series. Forecasting methods and software.
1.2	Forecasting with regression models. Deterministic trend and seasonality. Point and interval predictions. Measures of forecast accuracy.
1.3	Forecasting with exponential smoothing methods. Procedures of Holt and Winters. Weighted least squares.
2	Forecasting with ARIMA models.
2.1	Stationary processes. The general linear process. Stationarity and invertibility conditions. Mixed ARMA(p,q) process. Simple and partial autocorrelation functions. The most common stationary processes: AR(1), AR(2), MA(1), ARMA(1,1) and ARMA(2,1).
2.2	Nonstationary processes. ARIMA processes. The most common nonstationary processes: random walk, IMA(1,) and IMA(2,2). The airline model. The Box-Cox transformation.
2.3	ARIMA model building. The Box-Jenkins methodology: thecniques of identification, estimation and diagnosis checking of ARIMA models.
2.4	Optimal prediction. Calculating and updating forecasts. Forecast function and the role of the AR, I and MA operators. The forecast function of the airline model.
2.5	Intervention analysis and outlier detection. Calendar effects.
3	Forecasting with state space models.
3.1	State space model. Structural time series model with trend, seasonality and cycle. State space representation of an ARIMA model.
3.2	Kalman filter. Smoothing and forecasting.

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Time series analysis and forecasting	Work	No	Yes	70,00
Global test	Activity evaluation with Virtual Media	No	Yes	30,00
TOTAL				100,00

Observations

Practical project: analysis and forecasting of a monthly / quarterly series based on the methods described in the course. Each student must provide in the Moodle forum the complete information of their time series, the data file and the R scripts that allow their results to be replicated. In addition, the student must actively participate in the practical classes making proposals on the modeling of your time series. The report will be delivered by email in a pdf document preferably created in RStudio with Sweave / LaTeX, but the use of any other word processor is also allowed. In the qualification of the work, the participation of the student in the practical classes, the quality of the presentation, the precision in the terminology, the comprehension of the studied methodologies and the variety of methods of analysis used will be taken into account. The work will be rated from 0 to 10.

Test: collection of 30 questions about different theoretical and practical aspects of forecasting methods . It will be scored from 0 to 10. The student can improve the test score by presenting to the ordinary call and performing another test.

The grade of the continuous evaluation will be the weighted average of the marks obtained in the practical work and in the test type test, provided that both are greater than 4. The student can pass the subject completely by continuous evaluation, without the need of presenting to the ordinary call.

Students who do not pass the subject in the ordinary call will make the same exam as the part-time students in the extraordinary call.

Both the practical project and the test will be the two evaluation methods in the hypothetical scenario of non-presencial teaching.

Observations for part-time students

The evaluation method for part-time students will consist of a test and a practical case.

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

G.E.P. Box, G.M. Jenkins, G.C. Reinsel, G.M. Ljung (2015). Time Series Analysis: Forecasting and Control, 5th ed., Wiley Series in Probability and Statistics.

D. Peña (2010). Análisis de Series Temporales. Alianza Editorial.

J.D. Cryer, K.S. Chan (2010). Time Series Analysis: With Applications in R, 2nd ed., Springer.