Code: 81007

Subject name: Quantitative methods and forecasts

GENERAL CHARACTERISTICS

ECTS: 3

Language/s: English

Type: Obligatory

Teachers: Marianna Bosch Casabò

DESCRIPTION

BRIEF DESCRIPTION AND JUSTIFICATION

The objective of the course is to develop the basic knowledge and statistical techniques that will allow the student to analyse financial data, both cross sectional and time series.

Competencies

As a consequence of the acquisition of the contents of the subject, the student will be able to:

CE2. Apply the most relevant models and quantitative techniques of more extensive use in the praxis of the sector for the treatment of financial information, using the modelling of financial operations at an advanced level. (Modelling of financial transactions).

Prerequisites

Requirements legally established to access postgraduate programs:

Degrees in the field of social, scientific or technological sciences.

Contents

1. Introduction to the statistical analysis of financial data with R

   a. Simple and multiple linear regression

   b. Representation and description of time series

   c. The regression model with time series

d. Hypothesis of the model and diagnostic tests

2. ARIMA models for univariate time series

    a. Stochastic processes and seasonality

    b. ARMA Models

    c. Unit Root Contrasts

    d. Models ARIMA

3. Models of volatility

    a. The ARCH model

    b. The GARCH model

    c. Estimation and predictions

4. Autoregressive Vector Models (VAR)

    a. VAR Models

    b. Spurious Regression

    c. Cointegration

    d. The error correction model

METHODOLOGY

TRAINING ACTIVITIES:

Training activities	ECTS	Competencies
Lectures presenting concepts and procedures	1	CE2
Practical sessions (exercises, case resolution)	0,5	CE2
Assignments by Students	0,5	CE2
Seminars or tutorials	0,3	CE2
Personal study activities	0,6	CE2

Assessment sessions	0,1	CE2
Internship in Company		
TOTAL	3	

EXPLANATION OF TEACHING METHODOLOGY

There are two types of training activities:

<u>1.- Exposition and reading of theory on matter</u>

It corresponds to the exposition of the subject by the teacher and to the study of the subject by the student. This activity seeks to introduce the theoretical foundations of the subject, some data analysis software and its use to the study of cases.

<u>2.- Practical exercises and case discussion</u>

It corresponds to the preparation by the students of the practices corresponding to each theoretical theme. In this activity the transversal competences are developed mainly, while assimilating the knowledge that leads to the specific competences. This section takes into account both the practical sessions, the seminars and tutorials that are developed during the course, and the sessions of continuous evaluation. The work is done both individually and in working groups. They include data analysis with the appropriate software as well as the oral and written presentation of technical reports.

METHODS OF EVALUATION

Methods of evaluation

Methods of evaluation	Weight	Competencies
Final exam	30%	CE2
Partial exams	-	

Following up activities	20%	CE2
Homework and presentations	30%	CE2
Experimental work or fieldwork	-	
Projects	-	
Evaluation of the company or institution	-	
Participation	20%	

LEARNING OUTCOMES

At the end of the course the student should be able to:

- Analyse financial data, both cross-sectional and time series, using basic statistical techniques and appropriate software
- Present oral and written results of quantitative studies of financial data
- Interpret statistical studies of financial data based on basic descriptive, regression or time-series analyses
- Learn new, more sophisticated data analysis techniques in the future

EVALUATION

The final grade of the course responds to criteria of continuous evaluation and will be the result of applying the following percentages: 30% for the grade obtained in the final exam, 2% for class exercises and other follow-up activities (works and presentations), 20% for out-of-class exercises, 30% for the submission and presentation of case studies carried out in group.

EVALUATION OF COMPETENCIES

In all the evaluation activities of the subject, the specific competence of interpreting and analysing financial data, in which students must be able to use statistical software to analyse and describe the main characteristics of a dataset, with both cross sectional and time series data.

Bibliography

Bibliography

Campbell, J. Y., Lo, A. W. C., & MacKinlay, A. C. (1997). *The econometrics of financial markets*. Princeton, NJ: Princeton University Press.

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PREVIOUS CHANGES

LAST REVISION