Econometric Methods

Academic Year: (2022 / 2023)   **Review date: 04-05-2022**

Department assigned to the subject: Statistics Department

Coordinating teacher: RUIZ ORTEGA, ESTHER

Type: Compulsory ECTS Credits : 6.0

Year : 4 Semester : 1

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

All the previous courses on Mathematics, Statistics and Econometrics.

OBJECTIVES

An adequate knowledge on the following topics.
1.- Main stylized facts in economic time series.
2.- Quantitative models to represent these series: a) univariate models: deterministic and Arima; b) dynamic single-equation models with exogenous variables; c) VAR models for stationary time series and d) single-equation and multi-equation models for cointegrated time series.
3.- Methodology for building the models in point 2 with real data of the Spanish and Euro Area economies.
BY-PRODUCTS.
Resolution of problems using data. Knowledge of econometric software for professional work. Analysis of real data through econometric models.

DESCRIPTION OF CONTENTS: PROGRAMME

Chapter 1. TIME SERIES ECONOMETRICS FOR BUSINESS. PROPERTIES OF TIME SERIES AND STATISTIC FRAMEWORK FOR THEIR ANALYSIS
1.1   Econometrics for economists. Quantitative methods for business
1.2   Random samples and properties of time series
1.3   Components of a time series: trend, seasonality, cycle and disturbances.
1.4   Trend and seasonal. Stationarity transformations
1.7.1 Deterministic trends and seasonality
1.7.2 Segmented trends
1.7.3 Stochastic trend and seasonality

Chapter 2. LINEAR UNIVARIATE ARIMA MODELS
2.1 Stationary stochastic processes
2.2 Autocorrelation function and its estimation
2.3 White noise process
2.4 First order autoregressive model: AR (1)
2.5 Generalization to AR (p) models
2.6 Integrated models: ARI (l, p)
2.7 ARMA and ARIMA models

Chapter 3. SPECIFICATION, ESTIMATION AND DIAGNOSIS OF ARIMA MODELS
3.1 Box-Jenkins methodology
3.2 Initial specification
3.2.1 Unit root tests
3.2.2 Analysis of correlograms and partial correlograms of the original series and its transformations
3.2.3 Information criteria
3.3 Estimation: hipothesis testing
3.4 Diagnosis of ARIMA models:
a) Residual analysis
b) Tests of alternative models

Chapter 4. STATIONARY MULTIVARIATE MODELS

4.1 Stationary VAR(p) model.
4.2 Granger causality.

4.3 Estimation of VAR models
4.4 VAR models with exogenous variables
4.5 Uniequational dynamic models: autoregressive distributed lag models (ADL)
4.6 Impact and long run multipliers

Chapter 5. NON-STATIONARY MULTIVARIATE MODEL
5.1 Models with integrated variables. Spurious regression.
5.2 Cointegration
5.3 Vector equilibrium correction models (VEqCM)

LEARNING ACTIVITIES AND METHODOLOGY

Lectures with slides available in the web page of the course.
Classes for analytical and empirical problems, with additional solved problems in the web page of the course.
Classes in the computer room to work with real data.

ASSESSMENT SYSTEM

60% written final exam.
40% two written partial evaluations.

To pass the course a minimum calification of 5 over 10 in the final exam is required.

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

BASIC BIBLIOGRAPHY

- GONZALEZ-RIVERA, G. Forecasting for Economics and Business, Pearson, 2013

- PEÑA, D. Análisis de series temporales, Alianza Editorial , 2005

ADDITIONAL BIBLIOGRAPHY

- BOX, G.E.P. y JENKINS, G.M. Time Series Analysis, Forecasting and Control, Edward Elgar, 1970

- CHAREMZA, W.W. y DEADMA, D.R. New directions in Econometrics, Cambridge University Press, 1997

- LÜTKEPOHL, H. y KRÜKZIG, M. Apllied Time Series Econometrics, Cambridge University Press, 2004

- MILLS, T.C. Time Series Techniques for Econometrics, Cambridge University Press , 1990

- MILLS, T.C. Modelling Trends and Cycles in Economic Time Series, Palgrave Macmillan , 2003