LINEAR MODELS AND TIME SERIES ANALYSIS (m63105p)

Instructor: I.BALTAS

Core Course, 2nd semester, 5 ECTS units
Course level: Graduate (MSc)
Language: Greek

Course Description

This course serves as an introduction to the analysis of cross-sectional and time series data. It presents the basic principles, the properties, statistical inference procedures, model selection and the construction and evaluation of forecasts for these two classes of statistical models. The empirical part of the course consists of applying the above topics using the computational environment R.

Prerequisites

Basic knowledge of Probability Theory and Statistics.

Target Learning Outcomes

Upon successful completion of the course, students:

- Will have a basic understanding of conditional mean and conditional variance
- Will extensively explore the distinct types of correlation and the cases where these may or may not be the appropriate measures for use
- Will be able to estimate the parameters of simple and multiple regression models and understand the validity (or lack thereof) of the relevant assumptions
- Will be able to make predictions via regression models and accurately quantify the corresponding uncertainty
- have understood basic concepts of time series analysis (autocovariance, autocorrelation, partial autocorrelation, stationarity, ergodicity).
- Will be able to perform unit root tests.
- Will be able to apply various transformations to achieve stationarity.
- Will be familiar with the basic stochastic time series models, both stationary and non-stationary.
- Will be able to estimate the above models, perform diagnostics and apply various selection criteria techniques.
- Will be able to use the above models for forecasting

Recommended Bibliography

- Lecture notes
- Applied Regression Analysis, 3rd Edition (1998), Norman R. Draper, Harry Smith, Wiley
- Modern methods of time series analysis (2013). S. Dimeli, AUEB editions
- Time series analysis with applications in R (2008). J.D Cryer & K.S. Chan, Springer.

- Introductory Econometrics for Finance, Second Edition (2008). C. Brooks, Cambridge
- Applied Econometric Time Series, Fourth Edition (2014). W. Enders, Wiley.
- Introductory Econometrics: A modern approach, Fifth Edition (2013). J. Wooldridge, South-Western Cangage Learning

Teaching and Learning Activities

One three-hour lecture per week and study exercises as homework.

Assessment and Grading Methods

The course is examined by assignment.