Statistical methods in economics (60 hours, 9 ECTS)

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Prerequisites

No formal prerequisites are requested. However, a preliminary knowledge of descriptive statistics, random variables and statistical inference is warmly recommended.

Objectives and Structure

The main objective of the course is to provide the fundamental tools for the application of statistical methods to the analysis of economic data. The theoretical part will be supported by an applied part devoted to the analysis of real data sets by means of the software R. A student that has completed the course should be practiced in the application of advanced statistical methods, should be able to interpret the results of a statistical analysis, and should be aware of limitations and possible sources of errors in the analysis.

Outline

Part I: Introduction to data analysis and exploratory tecniques
- Cluster analysis
- Principal component analysis

Part 2: Normal linear regression and its generalizations
- Multiple regression
- Polynomial regression
- Logistic regression
- Beta regression
- Poisson and negative binomial regression
- Spatial regression models

Part 3: Panel data analysis
- Balanced and unbalanced panel, micro and macro panel
- Modeling the level of a dependent variable
- Modeling the change of a dependent variable
- Fixed effects and random effects models for categorical variables and continuous variables
- Spatial regression models for panel data

Textbooks and Teaching Material

Chatterjee, S. and Hadi, A.S. (2012), Regression Analysis by Example, 5th Edition, Wiley. Chapters: 1, 2, 3 (excluding 3.9), 4 (excluding 4.3, 4.9.2, 4.9.3, 4.10, 4.12, 4.13, 4.14), 5 (excluding 5.6 and 5.7), 6 (excluding 6.6 and 6.7), 9, 11, 12 (excluding 12.8.3 and 12.8.4), 13 (excluding 13.5, 13.6, 13.7).

Fox,J. and Weisberg, S. (2010), An R companion to applied regression, 2nd Edition, SAGE publications Inc.

Andreb, H-J, Golsch, K., Schmidt, A.W. (2013), Applied panel data analysis for economic and social surveys, Springer. Chapters: 1, 2, 3, 4.

Final assessment

Attending students will develop and discuss a short dissertation (January/February 2024 only). For non-attending students the course assessment will be based on a written exam held in the computer lab, that will involve the analysis of different data sets using the methods and models studied during the course.