



UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

SYLLABUS DEL CORSO

Econometrics

2627-1-F7704M016

Learning objectives

The course aims to provide the student with a range of econometric methods to assist him in the empirical verification of economic issues and in the treatment of quantitative data with the use of the programming language in R. For this reason, the course has both theoretical and applied content. All the topics covered will be the subject of computer exercises.

Knowledge and understanding

The student acquires knowledge of the theoretical foundations of the classical multiple linear regression model, the Gauss-Markov theorem, the properties of OLS and GLS estimators, and the methods for handling panel data (fixed effects and random effects). The student also understands the principles of specification, estimation, and hypothesis testing of the regression function.

Applying knowledge and understanding

The student is able to apply the econometric techniques studied to concrete economic problems, implementing model estimation and diagnostic testing in the R programming language. The student can translate an economic research question into a testable empirical model and produce correct and interpretable estimates.

Making judgements

The student develops the ability to select the most appropriate econometric methodology according to the nature of the data and the economic hypothesis, to critically assess goodness of fit and the validity of model assumptions, and to interpret estimation results independently, recognising their limitations and implications.

Communication skills

The student is able to present and discuss the results of an econometric analysis in written and oral form, using appropriate technical language in English, as demonstrated by the preparation and presentation of a short research paper.

Learning skills

The student acquires the methodological and computational tools to independently deepen more advanced econometric techniques and to keep up to date with emerging quantitative methodologies, in view of further studies or professional activity.

Contents

The course is dedicated to introducing the main econometric analysis techniques used in economic applications. Basic econometric tools will be provided relating to the specification and estimation of the regression function, as well as the testing of hypotheses. The study of the theoretical tools is then followed by their use for the verification of basic models of the economy.

Detailed program

Classical Multiple Linear Regression Model

Gauss-Markov theorem

OLS (Ordinary Least Squared)

Goodness of fit

Properties of estimators

Inference and Forecast

GLS (Generalized Least Squared)

Dummy variables

Panel data

Panel data: Fixed effects

Panel data: Random Effects

Prerequisites

Teaching methods

Standard classes and hands-on sessions using R.

Assessment methods

Final exam in English made and short research paper with presentation

Textbooks and Reading Materials

Stock, J. H., & Watson, M. W. (2020). Introduction to econometrics 4th ed.

Verbeeck M. (2012) A Guide to Modern Econometrics, 4th edition, John Wiley.

Greene, W. (2008). Econometric Analysis, 7th ed. Prentice Hall. New York, 7.

Semester

Teaching language

English

Sustainable Development Goals

QUALITY EDUCATION | DECENT WORK AND ECONOMIC GROWTH | CLIMATE ACTION
