UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Econometrics

2627-1-F5603M003-F5603M003-2

Learning objectives

The course provides the basic skills to carry out empirical analisis in microeconomics and macroeconomics.
By the end of the course, students will be expected to:

1. Knowledge and Understanding
   • Understand the mathematical and statistical foundations of multiple linear regression, panel data models, instrumental variables (IV), and limited dependent variables.
   • Comprehend underlying assumptions and the consequences of violations such as endogeneity, heteroskedasticity, and autocorrelation.
2. Applying Knowledge and Understanding
   • Independently manage, clean, and manipulate complex, real-world datasets with Stata
   • Translate economic theories into valid empirical specifications and correctly estimate advanced econometric models using Stata.
3. Making Judgments
   • Evaluate and justify the choice of specific estimators (e.g., Fixed Effects vs. Random Effects, OLS vs. 2SLS) based on data structure and identification strategy.
   • Analyze regression outputs and diagnostic tests to validate model robustness, discerning between statistical and economic significance.
4. Communication Skills
   • Write clear, structured empirical research papers that outline economic questions, methodologies, and findings.
   • Explain complex statistical results accurately and accessibly to both specialist economists and non-specialist audiences.
5. Learning Skills
   • Develop the necessary skills to independently formulate, investigate, and answer new empirical research questions.
   • Acquire the capacity to independently read and replicate advanced applied econometrics literature and Stata documentation.

Contents

Students are introduced to the main issues arising in applied work for an economist.

Detailed program

- The simple regression model
- Multiple regression analysis: estimation, inference, asymptotics
- Multiple regression analysis: further issues
- Multiple regression analysis with qualitative information
- Heteroskedasticity
- More on specification and data problems
- Basic regression analysis with time series data
- Further issues in using OLS with time series data
- Serial correlation and heteroskedasticity in time series regressions
- Models based on Panel Data
- IV estimation and 2SLS
- Simultaneous equations models
- Models with limited dependent variables
- Advanced Time Series Topics

Prerequisites

Statistics, mathematics.

Teaching methods

Emphasis is placed on the use of econometric software packages as tools of quantitative and statistical analysis. Practical computer exercises are a key part of the course. Lectures conducted in delivery mode in the initial part and in interactive mode in the later part. All activities are conducted in presence.

Assessment methods

Assessment for attending students is based on an in-class presentation of an empirical project (50% of the final grade) and a written examination (50% of the final grade). The written exam is in two parts. Part A: 32 closed questions aimed at evaluating the student’s knowledge of course concepts. Part B: 16 closed questions based on applications with Stata on actual data, aimed at evaluating the student’s ability to apply course concepts. Each correct (incorrect) answer is worth 0,75 (-0.75) points. The assessment of the empirical project, aimed at evaluating the student’s ability to apply course concepts, will be based on the following four criteria: originality, relevance, quality, competence.

Assessment for not attending students is based on an oral examination. The oral exam consists of (1) a series of open questions covering the entire syllabus (50% of the final grade) and (2) the discussion of an empirical project submitted by the student (50% of the final grade). The oral exam is aimed at evaluating the student's knowledge of course concepts and the student's ability to apply course concepts. The assessment of the empirical project, aimed at evaluating the student's ability to apply course concepts, will be based on the following four criteria: originality, relevance, quality, competence.

Textbooks and Reading Materials

"Introductory econometrics: a modern approach", by J.M. Wooldridge, Thompson South Western, Belmond, 5th ed.

Semester

Second semester

Teaching language

English

Sustainable Development Goals