Econometrics I

Academic Year: (2018 / 2019) **Review date: 09-05-2018**

Department assigned to the subject: Economics Department

Coordinating teacher: ALONSO BORREGO, CESAR

Type: Compulsory ECTS Credits : 6.0

Year : 1 Semester : 1

OBJECTIVES

The course tours through a selection of basic econometric techniques designed to conduct applied research with cross-sections. Development of programming skills in Stata will be an essential part of the course. Several popular economic models, such as the model of human capital and Mincer regressions will be used to motivate different econometric methods. Throughout the course, other empirical applications will be referred to, highlighting how the techniques learnt in the course can be successfully applied to other research questions. This goal will be accomplished through classroom lectures, practical sessions, and problem sets. Specifically, by the end of the course the student should be able to:
-Apply linear regression methods in empirical analysis.
-Use appropriate software to implement quantitative microeconomics research.
Skills the student will be able to gain during the course are:
-Understanding data limitations and their consequences in empirical analysis.
-Understanding the merits of OLS versus IV and GMM.
-Interpreting results in terms of policy implications both at government and firm level.
-Programming skills in quantitative research.

DESCRIPTION OF CONTENTS: PROGRAMME

1. Review of Probability

Basic definitions. Set theory. Random variables. Probability distributions. Features of univariate probability distributions (mean, variance, standard deviation). Multivariate distributions. Measures of association. Conditional expectations. Some important continuous distributions. Sampling: sample statistics and sampling distributions. The sample mean and its properties.

2. Introduction to the linear regression model

Linear projection and conditional expectation. The simple linear regression model. Classical assumptions. Interpretation. OLS estimation and inference. Properties.

3. Introduction to Stata Programming

Stata basics. Do-files and log files. Using results from Stata commands. Global and local macros. Lineal regression basics. Examples of Do-files.

4. The Multiple Linear Regression Model

The model with k independent variables. Interpretation of the regression equation. Comparison of simple and multiple regression. Functional form specification and transformations. OLS estimation. Goodness of fit. Standard Errors of the OLS estimators.

5. The Multiple Linear Regression Model: Inference

The OLS Estimator under the Classical Assumptions. Consistency and asymptotic normality with large samples. The t test. Testing linear combinations of the parameters: the F test.

6. Sources of Endogeneity

Omitted variables. Errors in Variables. Missing data and sample selection.

7. IV Estimation and 2SLS

Endogeneity. Instrumental Variables (IV). IV estimation of the linear multiple regression model. Two-Stage Least Squares (2SLS) estimation. Testing endogeneity and overidentifying restrictions. GMM.

LEARNING ACTIVITIES AND METHODOLOGY

Practice is essential to learning and understanding econometric tools. Therefore, there will be computer practice sessions and also computer exercises as homework. Database management will be an integral and essential part of the course. The course will focus on how the nature of the data available and the research questions lead to the choice of appropriate econometric techniques. Moreover, most of the motivations for all topics dealt with in the course will stress the need to be able to infer policy implications from the results of the research. The course will consist of 22 hours of theory lectures and

13 hours of computer practices.

Slides and books references are provided to facilitate successful course attendance. Slides, exercises, and other materials will be available at the course webpage

An important component of this course is experience with analyzing data. There are several statistical packages for analyzing data. In this course the chosen software is STATA. In computer sessions and computer exercises as homework, students will be encouraged to work in groups to discuss the issues and reach to the solutions as a team. No late work will be accepted. Students will also be encouraged to attend the office hours in order to receive clarification on material covered in class. Office hours will not be available for checking if answers to homework are correct: Students will be encouraged to compare answers with their classmates for this purpose.

ASSESSMENT SYSTEM

Continuous assesment 40%, Final Examination 60%
Continuous assesment includes the mid-term exam and can be complemented with class participation.
Students must obtain at least 40% in the final exam to pass the course. This rule applies both in the regular and the second call. In those cases in which, after weighting the grades from the continuous evaluation and the final exam, the final grade is above (or equal) 5 but the minimum grade in the final exam is not obtained, the final grade in the course will be 4 (Failed), unless the exam grade is below 3, in which case the final grade will be 3 (Failed).

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

BASIC BIBLIOGRAPHY

- Stock, James H.; Watson, Mark W. Introduction to Econometrics, Third Edition, Pearson, 2014
- Wooldridge, Jeffrey Introductory Econometrics: A Modern Approach, Cengage, 2016