

## Econometrics I (ECON-I)

### 1. Objectives

Econometrics I is the first part of a two-part Econometrics course oriented to management science research. The Econometrics course is mainly concerned with microeconomic analysis, the analysis of individual-level data on individuals or firms. The objectives of the course are:

- (a) To provide the student with some useful tools for his/her future research.
- (b) To help the student to develop a way of thinking in quantitative terms.

Econometrics I covers the analysis of cross-sectional and panel data. The dependent variable is assumed to be a continuous variable whose conditional distribution is normal, and the estimation method is most of the time ordinary least squares (OLS), or variations on this method, like two-stage least squares (2SLS) or generalized least squares (GLS) estimation.

### 2. Methodology

#### 2.1. Contents

1. Cross-sectional data analysis
2. Heteroskedasticity
3. Instrumental variables regression
4. Panel data analysis (1): Fixed effects
5. Panel data analysis (2): Random effects

#### 2.2. Description of the methodology

The sessions are distributed in blocks of the two sessions. They are conducted in a traditional, professor-to-student way. The topics covered are explained in a set of lecture notes and there is a worked example for each block. Computation is expected to be done in Stata.

The material for this course consists in the lecture notes, the worked examples and data sets. The data sets are in Stata format (extension .dta).

#### 2.3. Number and title of the sessions

The course has 10 sessions, listed in the table at the end of this outline.

#### 2.4. Description of the topics

The topics covered are described in the table.

#### 2.5. Required readings

The required readings are listed in the third column of the table.

## 2.6. Optional readings

JM Wooldridge (2000), *Introductory Econometrics*, South Western College Publishing.

AC Cameron & PK Trivedi (2010), *Microeconometrics using Stata*, Stata Press.

## 3. Grading

The grades are based on the participation (1/3) and the exercises submitted by the students at the end of each chapter (2/3).

## 4. Competences

### 4.1. General competences

CG1: Acquire knowledge, skills, abilities and attitudes required to conduct research on a global basis in the field of business management.

CG6: Use appropriate tools and techniques for problem solving, correction contrasting and decision validation – Specifically understand the principles of Econometrics, manage the techniques of linear regression and get practice with linear regression analysis of cross-sectional data.

### 4.2. Specific competences

CE2: Profound knowledge of tools in the fields of mathematics, statistics, econometrics and multivariable analyzes in order to carry out relevant research projects on a global level – Specifically: understand and apply OLS estimation, understand the heteroskedasticity issues and how to solve them, understand and apply instrumental variables regression and manage fixed, random and mixed effects models for panel data.

## 5. Outline of the course

SESSION	DESCRIPTION	CASE/ACTIVITY
1-2	1. Cross-sectional data analysis	Outline of the Econometrics I Course [ECON-01] Cross-sectional data analysis [ECON-E1] Supermarket data
3-4	2. Heteroskedasticity	[ECON-02] Heteroskedasticity [ECON-E2] Housing price data
5-6	3. Instrumental variables regression	[ECON-03] Instrumental variables regression [ECON-E3] Wage equation with instruments
7-8	4. Panel data analysis (1): Fixed effects	[ECON-04] Panel data analysis (1): Fixed effects [ECON-E4] Panel data on job training
9-10	5. Panel data analysis (2): Random effects	[ECON-05] Panel data analysis (2): Random effects [ECON-E5] A wage equation using panel data

## 6. Professor's Biography



Prof. Miguel Angel Canela  
Associate Professor of Managerial Decision Sciences

Prof. Canela holds a Ph. D. degree in Mathematics from the Universitat de Barcelona (1980). Before joining IESE in 2009, he was a professor at the Department of Applied Mathematics and Analysis of that university and a part-time professor of the Ph. D. Program at IESE. He also worked many years as a consultant at the Institut Català de Tecnologia.

His Ph. D. Dissertation and first research papers were concerned with various problems of Functional Analysis. Later, his interest switched towards interdisciplinary research, entering diverse fields, such as Management Science, Nutrition, Botany, Toxicology and Biochemistry. He has coauthored several research papers with IESE professors and students. Nowadays, his attention is focused on the application of Data Science to various aspects of Management.