

Microeconometrics

Course 2016-17

Summary:

Microeconometrics is a subject in the second semester of the Master in Economics. The aim of this subject is to provide economists sufficient knowledge of the most updated topics in microeconometrics so that they can choose the most appropriate estimators as well as exploit both the databases and economic models.

The programme is designed to respond to the needs of researchers and practitioners when working with real data, where an important dimension in the unit of analysis is the individual. This requires the use of micro data and the use of advanced techniques in (micro) econometrics.

The practical content of this course has two objectives: on the one hand, the knowledge and management of the statistic-econometric package STATA; on the other hand, and in each of the issues, being able to solve practical cases that require the use of the various estimators explained in the theoretical part of the program.

Learning outcomes:

On successful completion of the course, the student should be able to:

- Know and understand advanced micro-econometric methods.
- Choose between them depending on the economic problem at hand.
- Know how to estimate a specific economic model using real data, proper techniques and handling the statistic-econometric package STATA.
- Get familiar with the usage of Spanish and international databases.
- Be able to interpret estimation results from an economic perspective.

Topics:

Topic 1. Panel data models.

- 1.1. Fixed effects and random effects.
- 1.2. Static models.
 - 1.2.1. The random effects estimator: Generalized Least Squares (GLS).
 - 1.2.2. The fixed effects estimator: Within-Groups (WG) and individual dummies regression.
 - 1.2.3. Random effects *versus* fixed effects: Hausman test.
 - 1.2.4. Some instrumental variables (IV) extensions for the random and the fixed effects estimators.
- 1.3. Dynamic models.
 - 1.3.1. Problems in estimation of dynamic models with panel data.
 - 1.3.2. The Arellano and Bond estimator: An application of the Generalized Method of Moments estimator (GMM).
 - 1.3.3. The Sargan test of overidentifying restrictions.
 - 1.3.4. The test of correlation of idiosyncratic errors.
 - 1.3.5. The Arellano and Bover, and the Blundell and Bond estimator: the System Generalized Method of Moments estimator (System-GMM).

Topic 2. Discrete choice models.

- 2.1. Introduction.
- 2.2. Binomial response models: the linear probability model for binary response; and, the Probit and Logit models. Maximum likelihood estimation.
- 2.3. Reporting the results for Probit and Logit.
- 2.4. Multinomial discrete choice models: non-ordered (multinomial logit), probabilistic choice models (conditional multinomial logit) and non-ordered models.

Topic 3. Censored dependent variable models.

- 3.1. Introduction
- 3.2. The Tobit model
- 3.3. Estimation and inference of the Tobit model.
- 3.4. Reporting the results.

3.5. Heckman's method (sample selection models).

Topic 4. Count data models.

4.1. Definition, examples and distribution functions.

4.2. Poisson model.

4.2.1. Distribution function, properties and assumptions.

4.2.2. Maximum likelihood estimator and consistency.

4.2.3. Interpretation of coefficients: Marginal effects.

4.2.4. Main limitation of the Poisson model, consequences and solutions.

4.3. Negative Binomial model.

4.4. "Zero inflated" count data models.

Topic 5. Duration models.

5.1. General definitions.

5.2. Non-parametric analysis: the Kaplan-Meier estimator.

5.3. Regression analysis: proportional risk models and parametric models.

5.4. State-dependence *versus* unobserved heterogeneity.

5.5. Time varying regressors and models in discrete time.

Topic 6. An advanced topic.

To be chosen among the following ones:

6.1. Semiparametric and nonparametric methods.

6.2. Quantile regression.

6.3. Public policy evaluation.

Methodology:

Development for the course is structured around three elements.

First, the theoretical lectures, where we explain the most important concepts and illustrate the use of essential analysis techniques. The most relevant literature will be referenced. Attendance to these classes is considered crucial as it guarantees a proper transmission of knowledge and, at the same time, serves as a personal orientation to students.

Second, the practical classes where we solve exercises with real databases and use the statistic-econometric package STATA. In this way students will have sufficient

knowledge for solving personal exercises that will be delivered during the development of the subject.

Third, the study and preparation of materials by the student, as well as attendance at academic seminars.

Evaluation:

The composition of the final grade for this topic will be 80% from the exam score and 20% from the work developed by the student through the course.

References:

Basic and general references:

Cameron, A. C., and Trivedi, P. K. (2005): Microeconometrics: Methods and applications. Cambridge University Press.

Greene, W. H. (2003): Econometric analysis. 7th edition. Prentice-Hall.

Wooldridge, J. M. (2015): Introductory econometrics: a modern approach. 6th edition. Cengage Learning.

Wooldridge, J. M. (2010): Econometric analysis of cross section and panel data, 2nd edition. The MIT press.

Complementary and specific references:

Topic 1

Arellano, M. (2003): Panel data econometrics. Oxford University Press.

Hsiao, C. (2003): Analysis of Panel Data. 2nd edition. Cambridge University Press.

Lee, M. J. (2002): Panel data econometrics: Methods of moments and limited dependent variables. Elsevier Science.

Topic 2 and 3

Lee, M. J. (2002): Panel data econometrics: Methods of moments and limited dependent variables. Elsevier Science.

Maddala, G.S. (1983): Limited Dependent and Qualitative Variables in Econometrics, Cambridge University Press.

Topic 4

Winkelmann, R. (2005): Econometric analysis of count data. 5th edition. Springer-Verlag.

Topic 5

Jenkins, S.P. (2005). Survival Analysis. Unpublished manuscript, Institute for Social and Economic Research, University of Essex, Colchester, UK. Downloadable from <https://www.iser.essex.ac.uk/resources/survival-analysis-with-stata>.

Lancaster, T. (1990): The econometric analysis of transition data. Cambridge University Press.

Topic 6

Härdle, W. (1990): Applied nonparametric regression. Cambridge University Press.

Silverman, B. W. (1986): Density estimation for statistics and data analysis. Chapman and Hall.

Angrist; J. D. and J.S. Pischke (2008), *Mostly Harmless Econometrics: An Empiricists Companion*, Princeton University Press.

Chamberlain, G. (1994): “Quantile Regression, Censoring, and the Structure of Wages”, in C.A. Sims (ed.), *Advances in Econometrics, Sixth World Congress*, vol. 1, Cambridge University Press.

Koenker, R. (2005): *Quantile Regression*, Cambridge University Press.