

Econometrics

Master in Economics:
Empirical Applications and Policies
2016-2017

Class Teacher:

Petr Mariel (Room 1C17): October 17 – December 2 (30 hours)

Lecture notes, related documents and files of this course will be made available to students through Moodle platform: <http://egela.ehu.es/>

Objectives:

This course offers an introduction to cross sectional methods of estimation (microeconometrics) both from a theoretical and applied point of view. Students should gain sufficient understanding of econometric theory to understand empirical research and to use computer-based econometric tools.

Requirements:

Knowledge of linear algebra and calculus is required as is some basic statistical theory. The course will involve the use of the computer and some experience in STATA is required.

Grading & Organization:

Each week there will be two or three lectures. For each of the chapters a homework assignment will be handed in, to be returned in the following week. The assignments will be marked and returned to students. The marks obtained in them would account for 10% of the final mark.

Course Outline:

1. Multiple Regression Analysis: Further Issues

- 1.1. Functional forms of regression models
 - 1.1.1. The log-linear model
 - 1.1.2. More on using logarithmic functional forms
 - 1.1.3. Reciprocal models
 - 1.1.4. Polynomial regression models
- 1.2. Regression on dummy explanatory variables
 - 1.2.1. Different intercepts
 - 1.2.2. Different slope coefficients

2. Regression Analysis in Practice

- 2.1. Multicollinearity
- 2.2. Generalization of the General Linear Regression Model
 - 2.2.1. The regression model with non-spherical disturbances
 - 2.2.2. Generalized least squares (GLS) estimator
 - 2.2.3. Estimation of σ^2
 - 2.2.4. Feasible generalized least squares (FGLS)
- 2.3. Heteroskedasticity
 - 2.3.1. Detection of heteroskedasticity
 - 2.3.2. Weighted least squares (WLS): The heteroskedasticity is known up to a multiplicative constant
 - 2.3.3. The heteroskedasticity function must be estimated: Feasible generalized least squares
 - 2.3.4. ML estimation
- 2.4. Autocorrelation
 - 2.4.1. Detection of autocorrelation
 - 2.4.2. Modelization
 - 2.4.3. GLS estimation with AR(1) and MA(1) errors
 - 2.4.4. FGLS estimation with AR(1) errors
 - 2.4.5. ML estimation
- 2.5. Numerical methods for ML estimation

3. Specification and measurement errors, IV Estimation

- 3.1. The attributes of a good model
- 3.2. Types of specification errors
 - 3.2.1. Omitting a relevant variable: "Underfitting" a model
 - 3.2.2. Inclusion of irrelevant variables: "Overfitting" a model
- 3.3. OLS under measurement error
 - 3.3.1. Measurement error in the dependent variable
 - 3.3.2. Measurement error in an explanatory variable
- 3.4. Instrumental variables estimation and Two Stage Least Squares (2SLS)
 - 3.4.1. Instrumental variables estimation
 - 3.4.2. Two Stage Least Squares
 - 3.4.3. IV solutions to errors-in variables problems
- 3.5. Testing for endogeneity
- 3.6. Testing overidentification restrictions (exogeneity of instruments)

4. Qualitative Dependent Variables

4.1. Introduction

4.2. Binary outcomes

4.2.1. The linear probability model

4.2.2. A latent variable model for binary variables

4.2.3. ML estimation

4.2.4. Interpretation

4.2.5. Hypothesis testing

4.2.6. Goodness of fit

4.3. Ordinal Outcomes: Ordered Logit and Ordered Probit

4.3.1. A latent variable model for ordinal variables

4.3.2. ML estimation

4.3.3. Interpretation

4.4. Nominal Outcomes: Multinomial Logit

4.4.1. The MNL as a probability model

4.4.2. The MNL as a Discrete Choice Model

4.4.3. ML estimation and testing

4.4.4. Interpretation

4.4.5. The conditional logit model

5. Sample selection models

5.1 Censoring versus Truncation

5.2 Truncated and Censored Distribution

5.3 The Tobit Model for censored outcomes

5.4 Problems introduced by censoring

5.4.1 Analyzing censored data

5.4.2 Analyzing a truncated sample

5.5 Estimation

5.5.1 Estimation with censored data

5.5.2 Estimation with truncated data

5.6 Interpretation

5.7 Models for sample selection

5.8 Specification Issues in Tobit Models

6. Panel data analysis

6.1 Introduction

6.2 Pooling Independent Cross Sections across Time

6.3 Two-Period Panel Data Analysis

6.4 Fixed Effects Estimation

6.5 Random Effects Models

6.6 The Correlated Random Effects Approach

Reading:

Gujarati, D. (2006), Essential of Econometrics, Third Edition, McGraw-Hill, New-York.

Gujarati, D. (2003), Basic Econometrics, Fourth Edition, McGraw-Hill, New-York Maddala, G.S. (2002), "Introduction to Econometrics", Third Edition, Wiley. (M).

Wooldridge, J.M. (2006), Introductory Econometrics. A Modern Approach, Third Edition, Thomson South-Western.

Wooldridge, J.M. (2002), Econometric Analysis of Cross Section and Panel Data. The MIT Press