

12F001

Econometrics

6 ECTS

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Introduction

This course represents the first in a sequence of "empirical methods" which all master programs at the BGSE go through. The course reviews the main standard econometric methodologies from an empirical perspective (i.e. the emphasis is on data analysis) and should be enough to prepare students for the more advanced classes which will come in the subsequent quarters.

Objectives

The objective of this course is to familiarize the student with the basic methodologies of **applied** econometric data analysis. It is the natural follow-up to the statistics material which has been reviewed in the brush-up courses and the foundation for the more specialized second and third quarter courses aimed specifically at the analysis of empirical issues in finance, industrial organization or public economics. Given that this is a "Tools" course for the Masters program, its focus is on giving the student a general understanding of the different techniques and enabling him/her to use these techniques to analyze real data. The professor will, therefore, not emphasize the more formal aspects of econometrics. Instead, the main goal is to help the student see econometrics as a tool that helps to dissect the data in order to obtain interesting, and statistically sound, conclusions and to be able to communicate effectively those conclusions. However, a fair amount of formal derivations will be seen: these derivations are necessary to build the technique and understand what is going on "behind the numbers".

Required Background Knowledge

This course builds econometric analysis from zero, but knowledge of basic statistical inference and some basic calculus and matrix algebra is required. Thus, it is strongly recommended that students take the brush-up courses (in math and statistics) that the BGSE offers before the beginning of the regular term.

Regarding software, it will be assumed that students have attended the brush-up course on using STATA or that they are already familiar with that program. Besides, a little time will be spent going over

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the solution with Stata of the empirical examples. STATA is taking over as the software of choice for applied economics researchers, especially in cross-section and panel data contexts, so it will be used extensively. Learning how to use a more programming-oriented language, such as MATLAB, GAUSS, R, has a larger fixed cost, but provides the student with much more flexibility if the plan is to move into a career with strong analytical content (i.e. research).

Learning Outcomes

By the end of the class, students should be able to design a basic econometric analysis intended to contrast some hypothesis or to forecast the value of a variable of interest. This includes not only being able to design a correct "regression equation", but also to decide what data to collect and to learn the potential problems of the data and how these can be dealt with.

Methodology

The class activities will consist on 20 two-hour lectures where both the theory and empirical examples will be developed. 10 one-hour practice sessions (with a TA) will be devoted to cover some support material, solve the problem sets and do additional practice exercises.

For evaluation, students are supposed to solve four problem sets, which will be handed out at the beginning of the course. This problem sets, which are empirical applications of the basic techniques, should be done in groups of three or four people. There will also be a two-hour sit-in final exam at the end of the course.

Evaluation

Evaluation will be based on the problem sets (20%) and the final exam (80%).

Course contents

Part I. Basics of Regression Analysis

1) A quick review of statistics and properties of estimators

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2) A review of the Linear Regression Model

Part II. Using the Linear Regression Model

3) Inference and Prediction in the Linear Regression Model

4) Miscellaneous Topics:

- Using the Linear Regression Model
- When the assumptions break down - instrumental variables estimation

Part III. Advanced Estimation Methods

5) Estimation of multivariate systems

- SUR
- Systems of equations
- Panel data

6) Maximum-Likelihood Methods and applications

- Binary choice models
- Sample selection models

7) Generalized Method of Moments

Session outline (approx.)

Session	Title	Materials and book references (B: Baum; SW: Stock & Watson; G: Greene)
1	Introduction to Econometrics	
2	Review of the basics of statistical inference	(see reference file in class server)
3-5	The OLS estimator in the classical regression model: assumptions and properties	(see reference file in class server)
6-8	The OLS estimator in the classical regression model: applying the estimator in practice	(see reference file in class server)
9-10	The OLS estimator in the classical regression model: testing and prediction	(see reference file in class server)
11	The GLS estimator: assumptions, properties and the FGLS	- B: 6.1.5 (142-143) - SW: 18.6 - G: 12.4 (512-513), 12.5 (514-515)
12	Instrumental Variables Estimation	- SW: Chapter 12 (for intuition) 18.7 (727-733, for theory) - G : 9.5 (370-371)

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		- B : 8.1-8.6 (185-194), 8.10-8.11 (207-214)
13	Instrumental Variables Estimation	- SW: Chapter 12 (for intuition) 18.7 (727-733, for theory) - G : 9.5 (370-371) - B : 8.1-8.6 (185-194), 8.10-8.11 (207-214)
14	Seemingly Unrelated Regressions	- Notes provided by professor - B: 9.4 (236242) - G: 15.4 (614-620)
15	Systems of equations: identification issues	- G: 16, 653-676;
16	Systems of equations: estimation	- G: 16, 682-683, 692-693.
17	Linear Panel Data Models	- Notes provided by professor - SW: Chapter 10 (only for intuition) - G: 14.3-14.4 (560-577) - B: 9.1 (218-231)
18	Binary choice models: presentation	- SW: Appendix 11.2 (415-418) - G: 4.5 (123-133)
19	Binary choice models	- Notes provided by professor - SW: Chapter 11. - G: 19.3 (812-818, 820-823) - B: 10.1 (248-253)
20	Sample selection models	- Notes provided by professor - G: 20.4 (926-933) - B: 10.4 (266-271)

Bibliography

Baum, C.F. (2006). An Introduction to Modern Econometrics Using Stata. Stata Press:College Station, Texas.

Stock, J. and Watson, M. (2006). Introduction to Econometrics. Addison-Wesley.

Greene, W. H. Econometric Analysis. Prentice Hall. Various editions.

A handout will be provided that will map the topics of the course with the chapters/pages in the above books which cover each topic.

Professor's Biography

Prof. Gómez Biscarri holds an M.A. in Economics and a Ph.D. in Business Economics from UCLA. He is a professor of accounting, finance and econometrics at Universitat Pompeu Fabra, the Barcelona

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Graduate School of Economics and the Barcelona School of Management. He is also a part-time professor of IESE Business School and Deusto Business School. His current research focuses on time series econometrics, on the impact of accounting on the banking sector, specifically on earnings management behavior and on the effect of new accounting regulations on bank's strategies.