Econometrics A

LAURA MAYORAL AND RUBEN DURANTE
Institute for Economic Analysis and Barcelona GSE

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1. DESCRIPTION

This course is an introduction to empirical research. More specifically, it will focus on estimating causal relationships from observational data. The course will cover econometric theory, STATA practice, problem solving, article readings and student presentations. We will start by observing that most empirical questions can be framed as "what is the (causal) impact of X on Y?". This central question of econometrics, the question of causality, is our approach to the standard tools of linear least squares, instrumental variable estimation, and panel data analysis.

2. COURSE OUTLINE

(1) Introduction: The identification problem, randomised experiments as the golden benchmark. Quick review of probability and statistics (please review Greene, Appendices A, B, C and D). Conditional expectations. Asymptotic theory.
(2) Linear Regression: Ordinary Least Squares, Best Linear Unbiased Estimator, asymptotic properties; Inference: confidence intervals; Tests: F-tests; The Frisch-Waugh-Lovell theorem.
(3) Identification Issues in Linear Regressions. Omitted variable bias, Measurement error bias, Functional form misspecification.
(4) Inference Issues in Linear Regressions Heteroscedasticity, Clustering, Autocorrelation, spatial correlation.
(5) Instrumental variable estimation: IV estimator, exclusion restriction, consistency of the IV estimator, bias of the IV estimator, Hausman test. Weak Instruments.
(6) Panel data estimation: Random effects, fixed effects, within estimator and between estimator.

3. PREREQUISITES

Mastering basic notions of probability, statistics and linear algebra will be very useful. More specifically, we'll routinely employ the following concepts:

- Probability and statistics: random variables; probability and cumulative distributions; moments of random variables (expectation, standard deviation, conditional expectations, correlation); Bayes' rule; Asymptotic theory: convergence of random variables, law of large numbers and central limit theorem–. See Appendices B, C and D, Greene.

- Basic notions of matrix algebra: sum, multiplication, inversion, rank of a matrix. See Appendix A, Greene.
- Basic notions of real analysis: integrals and derivatives.

4. TEXTBOOKS

Main textbooks:

- Wooldridge, *Econometrics of Cross Section and Panel Data*, MIT PRESS
- A. Colin Cameron, Pravin K. Trivedi (2009) Microeconometrics Using Stata, Stata Press. Good manual to learn how to apply STATA in econometrics applications.

Other useful books:

- Greene (2012). Econometrics, Prentice Hall.
- J. Angrist and S. Pischke (2009). Mostly Harmless Econometrics: An Empiricist's Companion, Princeton University Press.
- Stock and Watson, "Introduction to Econometrics".

5. GRADING

This grading scheme corresponds to the first half of the course (taught by Laura Mayoral).

- Final examination (50%)
- Problem sets (30%)
- Empirical project (20%)

6. POLICIES

Late Assignments. You will be penalized 1/3 of a grade (e.g. from an A- to a B+) per day late. This policy will be maintained independent of the reason why the assignment is handed in late.

Missing exams. Students missing an exam will receive a grade of zero. If a true emergency situation arises, contact me prior to the scheduled test time. If I determine that the excuse is justified (e.g., in serious matters such as illness), we will schedule a make-up. Travel plans (e.g., a plane ticket purchased for departure before the day of the exam) are not an acceptable excuse.

Academic dishonesty. The work you do in this course must be your own work. Academic dishonesty is not only against the rules, it is cowardly, unfair to your classmates, and a waste of your tuition money. It will simply not be tolerated in this class.

7. OFFICE HOURS

By appointment. Please email me at: mayoralaura@gmail.com.

8. TEACHING ASSISTANT

Each week you will have a practical session taught by a TA. Office hours: Please email him (sanghyun.park@insead.edu) to arrange an appointment.

Please direct to him all your questions regarding STATA. Office hours: Please email him (sanghyun.park@insead.edu) to arrange an appointment.