barcelona **gse**
graduate school of economics

Syllabus

Objective

This course provides students with the basic econometric tools for cross-section, time series and panel data. It is an applied course preparing students to both conduct own empirical research projects and assess empirical research papers. Each of the discussed tools will be implemented using standard statistical software and real world data. Students will learn how to choose the adequate statistical method, discuss its identifying assumptions, correctly interpret its results and to translate them into economically meaningful answers.

The course also prepares students for the two follow-up courses Microeconometrics (2nd term) and Time Series Econometrics (3rd term).

Teachers

Kurt Schmidheiny
Universitat Pompeu Fabra
Jaume I Building 20.145
kurt.schmidheiny@upf.edu

Vasco Carvalho
CREi
Mercè Rodoreda, 23.309
vcarvalho@crei.cat

Time

Lecture: Tuesday 6pm - 6pm, Wednesday 9am - 12pm

Practica: tba

Outline

Part I: Microeconometrics (40 hours)

1. Causal effects and the logic of randomized experiments

2. Linear regression: Estimation, small and large sample properties, hypothesis testing, omitted variable bias, model selection, functional form, heteroscedasticity, autocorrelation, clustering

3. Instrumental variable estimation: Estimation, identification, weak instruments

4. Panel data: fixed effects, random effects

5. Maximum likelihood estimation

6. Binary choice: probit and logit

   Module 1: Data generating process and Monte Carlo simulation

   Module 2: Sampling distribution, asymptotics and the bootstrap

Part II: Time Series Econometrics (20 hours)

1. Stationary and Non-stationary Processes

2. Autoregressive and Moving Average Processes

3. Likelihood Methods for ARMA Processes: Estimation, Asymptotics and Hypothesis Testing

4. Vector Autoregressions: Definition, Impulse response functions, Variance decompositions and Estimation

5. Generalized Method of Moments

Structure

There will 6 hours of lectures and a 1 hour session with the TA in three groups.

Assessment

There will be graded weekly take home problem sets (25%), and a final exam in December (75%).

Software

We will use the econometrics software STATA for estimation and Monte Carlo experiments. Ambitious students are encouraged to write their own econometric programs in the matrix calculation language MATLAB.

Resources

Hand-outs, lecture notes and selected articles and data sets are provided on the course homepage:

http://kurt.schmidheiny.name/teaching/upf/econometrics/

Textbooks

Any textbook in econometrics covers the topics developed in this course. The technical level of this course will be closer to the introductory textbooks. However, students with a strong mathematical background may find the advanced textbook more appropriate. The two companions are not self-contained textbooks but useful to deepen the intuitive understanding.

Introductory textbooks

Stock, James H. and Mark W. Watson (2007), Introduction to Econometrics, 2nd ed., Pearson Addison-Wesley.

Wooldridge, Jeffrey M. (2009), Introductory Econometrics: A Modern Approach, 4th ed., South-Western Cengage Learning.

Harvey, Andrew C. (1993), Time Series Models, 2nd ed., MIT Press.

Advanced textbooks

Cameron, A. Colin and Pravin K. Trivedi (2005), Microeconometrics: Methods and Applications, Cambridge University Press.

Davidson, Russell and James G. MacKinnon (2004), Econometric Theory and Methods, Oxford University Press.

Enders, Walter (2003), Applied Econometric Time Series, Wiley.

Hamilton, James (1994), Time Series Analysis, Princeton University Press.

Hayashi, Fumio (2000), Econometrics, Princeton University Press.

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

Companion textbooks

Angrist, Joshua D. and Jörn-Steffen Pischke (2009), Mostly Harmless Econometrics: An Empiricist's Companion, Princeton University Press.

Kennedy, Peter (2008), A Guide to Econometrics, 6th ed., Blackwell Publishing.