



Course: Structural Micro and Time Series Tools for Policy Evaluation
Faculty: Joan Llull, Laura Mayoral
Term: 2nd Semester
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Description:

This course provides the students with frontier econometric methods for the analysis of micro data and time series. The Structural Micro part focuses on the estimation of dynamic discrete choice structural models that allow for modelling the behavior of forward looking agents making discrete decisions. These techniques are very useful for students interested in micro (they allow to explicitly test theories), macro (a very good complement to Quantitative Macro), and applied economics (they are particularly useful to perform *ex-ante* policy evaluation). The Time Series part ...

Objective:

The main goal of this course is to provide students with a frontier econometric toolbox that allows them to produce high level empirical analyses. This course highly recommended to any second year student with both macro and micro interests, and both theoretically and empirically oriented. The course devotes a special emphasis in the implementation of the different techniques,

with an array of problem sets in which students are expected to use each of the techniques presented in class in the analysis of real data.

Outline:

Part I: Structural Micro

1. Full solution Maximum Likelihood approaches
 - a. Introduction
 - b. Basic framework: conditional independence
 - c. Motivational example: Rust's engine replacement model
 - d. Estimation using full solution techniques
 - e. Extensions: unobserved heterogeneity and equilibrium
2. Conditional Choice Probability (CCP) estimation
 - a. Conditional value function representation
 - b. Finite dependence
 - c. Estimation methods
 - d. Unobserved heterogeneity and equilibrium
 - e. Aguirregabiria and Mira's iterative approach
3. Dynamic Discrete Games and Auctions: an introduction
 - a. Dynamic Discrete Games
 - b. Auctions

Part II: Time Series

References:

Part I: Structural Micro

Adda, J. and R. W. Cooper (2003), *Dynamic Economics: Quantitative Methods and Applications*. The MIT Press.

Altug, S. and R. A. Miller (1998), "The Effect of Work Experience on Female Wages and Labor Supply", *Review of Economic Studies*, 65, 45-85.

Aguirregabiria, V. and P. Mira (2002), "Swapping the Nested Fixed Point Algorithm: A Class of Estimators for Discrete Markov Decision Models", *Econometrica*, 70, 1519-1543.

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Berndt, E. K., B. H. Hall, R. E. Hall, J. A. Hausman (1974). "Estimation and Inference in Nonlinear Structural Models", *Annals of Economic and Social Measurement* 3, 653-665.

Eckstein, Z. and K. Wolpin (1989), "The Specification and Estimation of Dynamic Stochastic Discrete Choice Models: A Survey", *Journal of Human Resources*, 24: 562-598

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Hotz, V. J. and R. A. Miller (1993), "Conditional Choice Probabilities and the Estimation of Dynamic Models", *Review of Economic Studies*, 60, 497-529.

Keane, M. P. and K. I. Wolpin (1997), "The Career Decisions of Young Men", *Journal of Political Economy*, 105, 473-522.

Lee, D. and K. I. Wolpin (2006), "Intersectoral Labor Mobility and the Growth of the Service Sector", *Econometrica*, 74, 1-46.

Miller, R. A. (1997), "Estimating models of dynamic optimization with microeconomic data", in M. Pesaran and P. Schmidt (eds.), *Handbook of Applied Econometrics*, Vol. 2, pp. 246-299

Todd, P. and K. Wolpin (2006), "Assessing the Impact of School Subsidy Program in Mexico: Using a Social Experiment to Validate a Dynamic Behavioral Model of Child Schooling and Fertility", *American Economic Review*, 96, 1384-1417.

Rust, J. (1987), "Optimal Replacement of GMC Bus Engines: An Empirical Model of Harold Zurcher", *Econometrica*, 55, 999-1033.

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Grading:

Part I: Structural Micro (50% of the total grade)

50% Final exam. 25% Problem sets. 25% Paper presentation.

Part II: Time Series (50% of the total grade)