Advanced Econometrics and Empirical Economics I

Course title – Intitulé du cours	Advanced Econometrics and Empirical Economics I
Level / Semester – Niveau /semestre	Semester 1
School – Composante	Ecole d'Economie de Toulouse
Teacher – Enseignant responsable	Olivier De Groote
Other teacher(s) – Autre(s) enseignant(s)	Thierry Magnac
Other teacher(s) – Autre(s) enseignant(s)	
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Other teacher(s) – Autre(s) enseignant(s)	
Lecture Hours – Volume Horaire CM	30
TA Hours – Volume horaire TD	
TP Hours – Volume horaire TP	
Course Language – Langue du cours	English
TA and/or TP Language – Langue des TD et/ou TP	English

Teaching staff contacts:

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Offices hours by appointment (via email).

Course Objectives: newly acquired knowledge once the course completed should be well identified

Part 1: static and dynamic discrete choice models: applications in education and environmental economics

This parts covers the estimation of structural static and dynamic discrete choice models and how to use them for policy evaluation. We will pay special attention to estimation methods that avoid solving the model during estimation. The methods will be illustrated by discussing modeling choices made in recent papers that look at education policies and environmental policies. At the end of the course, students should understand which research questions can be addressed with each type of model, as well as the data requirements. Furthermore, they should develop insights in how to make a model tractable, while still allowing it to generate reliable conclusions.

Part 2: Panel data

This course aims at reviewing recent advances in the literature on panel data estimation in linear models, and, in particular, factor models and random coefficients models. The accent will be put on the modelling choices, the theoretical properties of various estimates under various empirically plausible conditions as well as a few empirical applications.

Prerequisites :

Part 1

Economics and econometrics at the level of M2 ETE. No initial knowledge of discrete choice models (or other structural models) is required. Familiarity with Stata (or equivalent).

Part 2

Knowledge of basic panel data methods as can be found in:

- Hsiao : Chapter 3
- Wooldridge : Chapters 10 and 11
- Arellano : Chapters 2, 3 and 5

Practical information about the sessions:

Part 1

Students are expected to actively participate in class and read the papers with applications that we will discuss.

Part 2

A student should:

- attend classes and read the required material before class. Instructions will be given beforehand on required readings each week.
- participate in class discussion
- organize a collective discussion at least once

Grading system :

Part 1

Students will be evaluated on the basis of their contribution to classes, a written paper and a coding assignment. The assignment covers the estimation and interpretation of the

results of static and dynamic models. The paper should explain a research question that can be addressed using a dynamic discrete choice model. The paper should consist of (1) a motivation of the research question, (2) a description of the dataset and (3) a model and estimation strategy with a justification of the modeling assumptions and the identification strategy.

Part 2

Students will be evaluated on the basis on participation in the class, and the organization of the collective discussion. An assignment will consist in a short essay/referee report/research project on a paper chosen from a list or any proposal that students might have.

Bibliography/references :

Part 1

Main material:

- Arcidiacono P., Ellickson, P., 2011. Practical Methods for Estimation of Dynamic Discrete Choice Models. Annual Review of Economics, 3: 363-394.
- Kalouptsidi, Scott, and Souza-Rodrigues, 2020. Linear IV Regression Estimators for Structural Dynamic Discrete Choice Models. Journal of Econometrics 222 (1C): 228-804.
- Train, K., 2009. Discrete Choice Methods with Simulation. Cambridge University Press.

Some key contributions we rely on:

- Arcidiacono, P., and Miller, R. Conditional Choice Probability Estimation of Dynamic Discrete Choice Models With Unobserved Heterogeneity. Econometrica 79, no. 6 (2011).
- Berry, S., 1994. Estimating Discrete-Choice Models of Product Differentiation. The RAND Journal of Economics 25 (2): 242.
- Hotz, J., and Miller, R. Conditional Choice Probabilities and the Estimation of Dynamic Models. The Review of Economic Studies 60, no. 3 (1993): 497–529.
- Keane, M., and Wolpin, K. The Career Decisions of Young Men. Journal of Political Economy 105, no. 3 (1997): 473–522.
- Magnac, T., Thesmar, D., 2002. Identifying dynamic discrete decision processes. Econometrica 70, 801816.
- Rust J., 1987. Optimal Replacement of GMC Bus Engines: An Empirical Model of Harold Zurcher. Econometrica, 55 (5): 999-1033.

Applications to discuss (preliminary list):

- Abdulkadiroglu, A., Agarwal, N. and Pathak, P. The Welfare Effects of Coordinated Assignment: Evidence from the New York City High School Match. American Economic Review 107, no. 12 (2017): 3635–89.
- Grigolon, L., Reynaert, M. and Verboven, F. Consumer Valuation of Fuel Costs and Tax Policy: Evidence from the European Car Market. American Economic Journal: Economic Policy 10, no. 3 (2018): 193–225.
- Arcidiacono, P. Affirmative Action in Higher Education: How Do Admission and Financial Aid Rules Affect Future Earnings? Econometrica 73, no. 5 (2005): 1477–1524.
- Heckman, J.J., Humphries, J.E., Veramendi, G., 2018. Returns to Education: The Causal Effects of Education on Earnings, Health, and Smoking. Journal of Political Economy 126, 51.

- De Groote, O. and Verboven, F. Subsidies and Time Discounting in New Technology Adoption: Evidence from Solar Photovoltaic Systems. American Economic Review 109, no. 6 (2019): 2137-2172.

Part 2: Seminal papers

1. Factor models:

Ahn, S. C., Lee, Y. H., & Schmidt, P. (2001). GMM estimation of linear panel data models with time-varying individual effects. Journal of econometrics, 101(2), 219-255.

Bai, J. (2009). Panel data models with interactive fixed effects. Econometrica, 77(4), 1229-1279.

Pesaran, M. H. (2006). Estimation and inference in large heterogeneous panels with a multifactor error structure. Econometrica, 74(4), 967-1012.

2. Random coefficients:

Arellano, M., & Bonhomme, S. , 2011, Identifying distributional characteristics in random coefficients panel data models. The Review of Economic Studies, 79(3), 987-1020.

Chamberlain, G., 1992, Efficiency bounds for semiparametric regression. Econometrica: Journal of the Econometric Society, 567-596.

Graham, B. S., & Powell, J. L., 2012, Identification and estimation of average partial effects in "irregular" correlated random coefficient panel data models. Econometrica, 80(5), 2105-2152.

Session planning :

Part 1

1) static discrete choice
2) dynamic discrete choice: full solution methods
3) dynamic discrete choice: estimators that don't require solving model

Part 2:

1. Panel Data Methods: Recent advances : Prerequisites & Notation
2. Factor models in micro-econometrics: An Overview
3. Random coefficients: An Introduction

Distance learning *:*

Lectures and meetings will continue on zoom in the case of in-person restrictions. To facilitate interaction, we encourage everyone to use their webcam.