Topics in Econometrics and Empirical Economics

Course title - Intitulé du cours	Topics in Econometrics and Empirical Economics
Level / Semester - Niveau /semestre	Master 2 Economic Theory and Econometrics / Semester 2
Teacher - Enseignant responsable	Nour Meddahi
Other teacher(s) - Autre(s) enseignant(s)	Christian Bontemps and Arnaud Maurel
Other teacher(s) - Autre(s) enseignant(s)	
Other teacher(s) - Autre(s) enseignant(s)	
Other teacher(s) - Autre(s) enseignant(s)	
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	
TA and/or TP Language - Langue des TD et/ou TP	

Teaching staff contacts:

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Nour Meddahi: nour.meddahi@tse-fr.eu (Office 524)

Course's Organization:

The course is structured in two parts. The first one is on "Investment Decisions in Schooling" by Arnaud Maurel (15 h). The second part has two parts (7.5 hours for each): "Introduction to Set Identification" by Christian Bontemps and "An Introduction to the Econometrics of Unstructured and Text Data" by Nour Meddahi.

Prerequisites :

Econometrics 1 of M2 ETE

Practical information about the sessions:

- Arnaud Maurel will teach on Thursday from 14h00 to 15h30 during 10 weeks
- Christian Bontemps will teach on Thursday from 15h30 to 17h00 during the first 5 weeks
- Nour Meddahi will teach on Thursday from 15h30 to 17h00 during the last 5 weeks

Course's Contents:

Part I Investment Decisions in Schooling by Arnaud Maurel (arnaud.maurel@tse-fr.eu, T516)

This part of the course deals with the empirical analysis of schooling investment decisions, with a focus on higher education demand. After presenting the Human Capital and signaling models, we will review the estimation of the returns to schooling and the modeling of educational choices through dynamic structural frameworks. Then, we will focus on post-secondary schooling decisions and examine the determinants of

college attendance and major choice, with an emphasis on the role played by expected monetary returns, (imperfect) information and learning, preferences and credit constraints.

The validation of the course will be through the presentation and discussion of a research paper, and production of a short research proposal (less than 5 pages long).

Tentative course outline and reading list:

Lectures 1 and 2: Human Capital and signaling models

Altonji, J., and Pierret, C. (2001), "Employer learning and statistical discrimination", *Quarterly Journal of Economics*, vol. 116, No.1, pp. 313-350.

Becker, G. (1993), *Human Capital: A theoretical and empirical analysis, with special reference to education*. University of Chicago Press.

Bedard, K. (2001), "Human capital versus signaling models: university access and high school dropouts", *Journal of Political Economy,* Vol. 109, No.4, pp. 749-775.

Clark, D., and Martorell, P. (2014), "The signaling value of a high school diploma", *Journal of Political Economy,* Vol. 122, No.2, pp. 282-318.

Ben-Porath, Y. (1967), "The production of human capital and the life cycle of earnings", *Journal of Political Economy,* Vol.75, No.4, pp.352-365.

Fang, H. (2006), "Disentangling the college wage premium: estimating a model with endogenous education choices'', *International Economic Review,* Vol.47, No.4, pp.1151-1185.

Kroch, E. and Sjoblom, K. (1994), "Schooling as human capital or signal: some evidence", *Journal of Human Resources,* Vol. 29, No.1, pp. 156-180.

Lang, K., and Kropp, D. (1986), "Human capital versus sorting: the effects of compulsory attendance laws", *Quarterly Journal of Economics*, Vol.101, No.3, pp.609-624.

Spence, M. (1973), "Job market signaling", Q*uarterly Journal of Economics*, Vol.87, No.3, pp.355-374.

Tyler, J.H., Murnane, R.J., and Willett, J.B. (2000), "Estimating the labor market signaling value of the GED", *Quarterly Journal of Economics*, Vol.115, No.2, pp.431-468.

Lecture 3: Returns to schooling

Angrist, J. and Krueger, A. (1991), "Does compulsory school attendance affect schooling and earnings?",*Quarterly Journal of Economics*, Vol.106, No.4, pp979-1014.

Ashworth, J., Hotz, V.J., Maurel, A. and Ransom, T. (2021), "Changes across cohorts in wage returns to schooling and early work experiences", *Journal of Labor Economics*, Vol. 39, No. 4, pp. 931-964.

Bhuller, M., Mogstad, M. and Salvanes, K.G. (2017), "Life-cycle earnings, education premiums, and internal rates of return", *Journal of Labor Economics,* Vol. 35, No. 4, pp. 993 – 1030.

Card, D. (2001), "Estimating the return to schooling: Progress on some persistent econometric problems", *Econometrica,* Vol.69, No.5, pp.1127-1160.

Carneiro, P. and Lee, S. (2011), "Trends in quality-adjusted skill premia in the United States, 1960-2000", *American Economic Review,* Vol.101, No.6, pp.2309-2349.

Heckman, J.J., Humphries, J. E. and Veramendi, G. (2018), "Returns to education: The causal effects of education on earnings, health, and smoking." *Journal of Political Economy,* Vol. 126 S1, pp. S197-S246

Heckman, J. J., Lochner, L.J., and Todd, P.E. (2006), "Earnings functions, rates of return and treatment effects: The Mincer equation and beyond", *Handbook of the Economics of Education,* Vol. 1, pp.307-458.

Mincer, J. (1974), *Schooling, Experience and Earnings*, New York: NBER.
Zimmerman, S. D. (2014) "The returns to college admission for academically marginal students" *Journal of Labor Economics,* Vol. 32, No. 4, pp. 711-754.

Lecture 4: Dynamic structural models of educational choices

Arcidiacono, P., Aucejo, E., Maurel, A. and Ransom, T. (2025), "College Attrition and the Dynamics of Information Revelation", *Journal of Political Economy,* Vol. 133, No. 1.

Belzil, C. (2007), "The returns to schooling in structural dynamic models: a survey", European Economic Review, Vol.51, pp.1059-1105.

Flinn, C., and Mullins, J. (2015), "Labor market search and schooling investment", *International Economic Review,* Vol. 56., No. 2, pp. 359-398.

Heckman, J.J., and Navarro, S. (2007), "Dynamic discrete choice and dynamic treatment effects", *Journal of Econometrics,* Vol.136, No.2, pp. 341-396.

Keane, M. P., and Wolpin, K.I. (1997), "The career decisions of young men", *Journal of political Economy,* Vol.105, No.3, pp.473-522.

Sullivan, P. (2010), "A dynamic analysis of educational attainment, occupational choices, and job search", *International Economic Review,* Vol. 51, No. 1, pp. 289-317.

Taber, C. (2001), ``The Rising College Premium in the Eighties: Return to College or Return to Unobserved Ability?'', *Review of Economic Studies,* vol. 68, pp.665-691.

Todd, P. and Wolpin, K. (2006),"Assessing the impact of a school subsidy program in Mexico: using a social experiment to validate a dynamic behavioral model of child schooling and fertility", *American Economic Review,* vol. 96, No.5, pp.1384-1417.

Todd, P., and Zhang, W. (2020), "A dynamic model of personality, schooling, and occupational choice", *Quantitative Economics,* Vol. 11, pp. 231-275.

Lecture 5: College attendance decisions

Bettinger, E. P., Long, B., Oreopoulos, P. , and Sanbonmatsu, L. (2012), "The role of application assistance and information in college decisions: Results from the H&R Block FAFSA experiment'', *Quarterly Journal of Economics,* vol.127, pp. 1205–1242.

Boneva, T., and Rauh, C. (2019), "Socio-economic gaps in university enrollment: the role of perceived pecuniary and non-pecuniary returns", Working paper.

Carneiro, P., Hansen, K., and Heckman, J.J. (2003), " Estimating distributions of treatment effects with an application to the returns to schooling and measurement of the effects of uncertainty on college choice ", *International Economic Review,* Vol. 44, No.2, pp. 361 - 422 .

Cunha, F., Heckman, J. and Navarro, S. (2005), "Separating uncertainty from heterogeneity in life cycle earnings", *Oxford Economic Papers,* vol.57, pp. 191-261.

D'Haultfoeuille, X., and Maurel, A. (2013), "Inference on an extended Roy model ,with an application to schooling decisions in France'', *Journal of Econometrics,* Vol. 174, pp. 95 - 106.

Fu, C. (2014), "Equilibrium tuition, applications, admissions, and enrollment in the college market", *Journal of Political Economy,* Vol. 122, No. 2, pp. 225-281.

Pallais, A. (2015), "Small differences that matter: mistakes in applying to college", *Journal of Labor Economics*, Vol. 33, pp. 493-520.

Pistolesi, N. (2017), "The effect of advising students at college entrance: Evidence from a French university reform", *Labour Economics,* Vol. 44, pp. 106-121.

Stange, K. (2012), "An empirical investigation of the option value of college enrolment", *American Economic Journal: Applied Economics,* Vol. 4, No.1, pp. 49-84.

Willis, R. J., and Rosen, S. (1979), "Education and self-selection", *Journal of Political Economy*, Vol. 87, No. 5, pp. 7-36.

Lecture 6: College major choices

Altonji, J., Arcidiacono, P. and Maurel, A. (2016), "The analysis of field choice in college and graduate school: determinants and wage effects", In *Handbook of the Economics of Education, Vol. 5,* edited by Eric A. Hanushek, Stephen Machin and Ludger Woessmann. Amsterdam: North Holland, pp. 305-396.

Altonji, J., Blom, E. and Meghir, C. (2012), "Heterogeneity in human capital investments: high school curriculum, college major, and careers", *Annual Review of Economics,* Vol. 4, pp. 185-223.

Arcidiacono, P. (2004), "Ability sorting and the returns to college major", *Journal of Econometrics,* Vol.121, No.1, pp.343-375.

Arcidiacono, P., Hotz, V.J. and Kang, S. (2012), "Modeling college major choices using elicited measures of expectations and counterfactuals", *Journal of Econometrics,* Vol. 166, pp. 3 - 16.

Baker, R., Bettinger, E., Jacob., B. and Marinescu, I. (2018), "The effect of labor market information on community college students' major choice", *Economics of Education Review,* Vol. 65, pp. 18-30.

Beffy, M., Fougere, D. and Maurel, A. (2012), "Choosing the field of study in postsecondary education: do expected earnings matter?"*, Review of Economics and Statistics,* Vol. 94, No. 1, pp. 334 - 347.

Bordon, P., and Fu, C. (2015), "College-major choice to college-then-major choice", *Review of Economic Studies,* Vol. 82, No.4, pp. 1247-1288.

De Giorgi, G., Pellizzari, M. and Redaelli, S. (2010), "Identification of social interactions through partially overlapping peer groups", *American Economic Journal: Applied Economics,* vol. 2, pp. 241–275.

Stinebrickner, T. R., and Stinebrickner, R. (2014), "A major in science? initial beliefs and final outcomes for college major and dropout", *Review of Economic Studies,* Vol. 81, pp. 426-472.

Wiswall, M., and Zafar, B. (2015), "Determinants of college major choice: identification using an information experiment", *Review of Economic Studies,* Vol.82, No.2, pp. 791-824.

Zafar, B. (2013), "College major choice and the gender gap", *Journal of Human Resources,* Vol. 48, pp. 545-595.

Lecture 7 : The role of credit constraints

Acemoglu, D. and Pischke, J-S. (2001), "Changes in the wage structure, family income, and children's education", *European Economic Review*, Vol.45, No.4, pp.890-904.
Becker, G. (1967), *Human Capital and the Personal Distribution of Income: An Analytical Approach,*.Woytinsky Lecture No. 1., Ann Arbor, Mich.: Inst. Public Admin.

Belzil, C., Maurel, A., and Sidibe, M. (2021), "Estimating the value of higher education financial aid: evidence from a field experiment", *Journal of Labor Economics*, Vol. 39, No. 2, pp. 361-395.

Brown, M., Scholz, J.K., and Seshadri, A. (2012), "A new test of borrowing constraints for education", *Review of Economic Studies,* Vol. 79, No. 2, pp. 511-538.

Cameron, S. and Taber, C. (2004), "Estimation of educational borrowing constraints using returns to schooling", *Journal of Political Economy,* vol.112, No.1, pp. 132-182.

Carneiro, P., and Heckman, J.J. (2002), "The evidence on credit constraints in post-secondary schooling", *The Economic Journal*, Vol.112, pp.705-734.

Delavande, A., and Zafar, B. (2019), "University choice: the role of expected earnings, non-pecuniary outcomes and financial constraints", *Journal of Political Economy,* Vol. 127, No. 5, pp. 2343-2393.

Hai, R., and Heckman, J.J. (2017), "Inequality in human capital and endogenous credit constraints", *Review of Economic Dynamics,* Vo. 25, pp. 4-36.

Keane, M.P., and Wolpin, K.I. (2001), "The effect of parental transfers and borrowing constraints on educational attainment", *International Economic Review*, Vol. 42, No.4, pp.1051-1103.

Stinebrickner, R. and Stinebrickner, T. (2008), ``The Effect of Credit Constraints on the College Drop-Out Decision: A Direct Approach Using a New Panel Study'', *American Economic Review,* vol. 98, No.5, pp. 2163-2184.

Part IIa Introduction to Set Identification by Christian Bontemps (christian.bontemps@tse-fr.eu, T518)

Course description:
Structural (micro)econometric models are central to policy analysis. They aim to specify how economic agents (firms, consumers, etc.) make decisions and respond to environmental changes. The increasing availability of detailed microdata has given rise to a rich body of empirical literature on the estimation of structural economic models. These models have been used to better understand how agents make choices, respond to policies, and interact with one another. When estimating structural models, the traditional econometric approach has relied on the concept of point identification of the model parameters. Point identification means that the parameters of interest (e.g., price elasticity, job-to-job transition rates, interaction parameters, etc.) can be recovered from functions of the data and estimated accordingly.

Point identification is often achieved by imposing assumptions on the data-generating process. However, these assumptions can vary in their degree of credibility. Some assumptions are considered plausible, such as those based on how the data were constructed (e.g., random sampling) or those embedded in economic theory (e.g., rationality). Other assumptions are less credible, as they may be motivated only by tractability concerns or the goal of achieving precise (i.e., point) identification results. Examples of such assumptions include distributional assumptions on unobserved variables, assumptions about agents' information in decision problems, assumptions about the order of entry in models of market structure, and assumptions about agents' compliance with experimental rules in randomized experiments.

In recent years, building on earlier work by C. Manski and his coauthors, the set (or partial) identification approach has demonstrated that analysts can learn about population parameters without relying on the less credible assumptions mentioned above. According to this approach, analysts obtain a set (possibly non-singleton) of parameter values that are observationally equivalent. A rich research agenda has emerged around the application of this approach in various areas of economics, particularly in industrial organization (IO), along with the design of procedures involving moment inequalities. Notably, this weaker notion of identification has been applied in the past to specific examples, such as the well-known Fréchet bounds or the bounds on parameters in measurement error models, among others.

The goal of this class is to introduce the literature on partial identification. Particular attention will be devoted to leading theoretical papers as well as to the few empirical applications, primarily in empirical IO.

The class consists in lectures. Student will be ask to run simulation exercise and to write a small essay. The topics taught in class (1.5 hours per week, the first five weeks) are (approximately) the following:

- Week 1: introduction on partial identification with some examples

- Week 2: The moment inequality approach

- Week 3: The geometric approach

- Week 4 and Week 5: A few examples of interest.

A short reading list to start with
- Andrews, D.W.K., and X. Shi, 2013, "Inference Based on Conditional Moment Inequalities", *Econometrica*, 81:609-666.

- Andrews, D.W.K., and G. Soares}, 2010, "Inference for Parameters Defined by Moment Inequalities Using Generalized Moment Selection", *Econometrica*, 78:119-157.

- Andrews, D.W.K., and P. Jia Barwick}, 2012, "Inference for Parameters Defined by Moment Inequalities: A Recommended Moment Selection Procedure", *Econometrica*, 80:2805-2826.

- Beresteanu, A., and F. Molinari, 2008, "Asymptotic Properties for a Class of Partially Identified Models", *Econometrica*, 76:763-814.

- Beresteanu, A., Molchanov O. and F. Molinari, 2011, "Sharp Identification Regions in Models with Convex Moment Predictions", *Econometrica*, 79:1785-1821.

- Beresteanu, A., Molchanov O. and F. Molinari, 2012, "Partial Identification Using Random Set Theory", Journal of Econometrics, 166:17-32.

- Bontemps, C., T. Magnac and E. Maurin, 2012, "Set Identified Linear Models", E*conometrica*, 138:2786-2807.

- Bugni, F, I. Canay and X. Shi, 2015, "Inference for subvectors and other functions of partially identified parameters in moment inequality models", *Quantitative Economics*, 8:1-38.

- Chernozhukov, V., H. Hong and E. Tamer, 2007, "Estimation and Confidence Regions for Parameter Sets in Econometric Models", *Econometrica*, 75:1243-1284.

- Chernozhukov, V., D. Chetverikov and K. Kato, 2018, "Inference on Causal and Structural Parameters using many moment inequalities, *The Review of Economic Studies*, 86:1867-1900.

- Manski, C.F., and E. Tamer, 2002, "Inference on Regressions with Interval Data on a Regressor or Outcome", *Econometrica*, 70:519-546.

- Romano, J.P., and A.M. Shaikh, 2012, "Inference for the Identified Set in Partially Identified Econometric Models", *Econometrica*, 78:169-211.

- Romano, J.P., A.M. Shaikh and M. Wolff, 2014,"A Practical Two-Step Method for Testing Moment Inequalities" *Econometrica*, 82:1979-2001.

Part IIb An Introduction to the Econometrics of Unstructured and Text Data by Nour Meddahi (nour.meddahi@tse-fr.eu, T524)

The main goal of the lectures is to introduce the students to a new arear of research where the data comes from newspapers, announcements, social networks, images, etc… We will cover several topics, in particular:

Building and Using Meaningful Variables from Text and Unstructured Data

Text Analysis and Topical Models

Narrative SVAR

Classical and Nonclassical Measurement Error Problems

Econometrics Analysis of a couple of examples

Large Language Models

Assessment: Project or a review of a couple of papers.

References:

Baker, S. R., Bloom, N., & Davis, S. J. (2016). Measuring economic policy uncertainty. The quarterly journal of economics.

Battaglia, L., Christensen, T., Hansen, S., & Sacher, S. (2024). Inference for regression with variables generated from unstructured data. Working Paper.

Bybee, L., Kelly, B., Manela, A., & Xiu, D. (2024). Business news and business cycles. The Journal of Finance.

Chen, Y., Kelly, B. T., & Xiu, D. (2022). Expected returns and large language models. Working Paper.

Ke, Z. T., Ji, P., Jin, J., & Li, W. (2023). Recent advances in text analysis. Annual Review of Statistics and Its Application.

Plagborg-Møller, M., & Wolf, C. K. (2022). Instrumental variable identification of dynamic variance decompositions. Journal of Political Economy.

Schennach, S. M. (2016). Recent advances in the measurement error literature. Annual Review of Economics.

Stock, J. H., & Watson, M. W. (2018). Identification and estimation of dynamic causal effects in macroeconomics using external instruments. The Economic Journal.

Grading system:

To be discussed during the lectures