

Mathieu Marcoux

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Citizenship Canadian

Languages English (fluent), French (native), German (basic)

Research Interests Econometrics
Applied Econometrics
Industrial Organization

Teaching Interests Econometrics
Quantitative Methods in Economics
Empirical Industrial Organization

Education

2011-present PhD, Economics, University of Toronto (expected July, 2017)

Dissertation: “Identification and Estimation of Empirical Games”

Committee: Victor Aguirregabiria (supervisor), Christian Gouriéroux, Ismael Mourifié, Yuanyuan Wan

2009-2011 MA, Economics (with distinction), Université Laval

Thesis: “A Forecast Model for Natural Gas Demand in the Province of Quebec” (Social Sciences Best Master’s Thesis, 2011)

Supervisor: Jean-Thomas Bernard

2006-2009 BA, Economics (with distinction), Université Laval

Awards

Tom Easterbrook Graduate Scholarship in Communications and the Mass Media, 2015, 2016

Ontario Graduate Scholarship, 2014, 2015

Social Sciences and Humanities Research Council Doctoral Scholarship, 2011-2014

Desjardins Postsecondary Bursary, 2011

Social Sciences and Humanities Research Council Master's Scholarship, 2010

Fonds de Recherche Société et Culture Master's Scholarship, 2010
GREEN-Gaz Métro Master's Scholarship, 2009-2010

Research Papers

“Games with Unobservable Heterogeneity and Multiple Equilibria: An Application to Mobile Telecommunications,” (*Job Market Paper*)

“Sharp Test for Equilibrium Uniqueness in Discrete Games with a Flexible Information Structure”

“Two-Step Semiparametric Estimation of Dynamic Discrete Games: A Comparison of Bias Reduction Techniques”

Professional Experience

- 2016 Course Instructor, University of Toronto
- Quantitative Methods in Economics (Undergraduate, core sequence)
 - Teaching evaluations: 4.04/5
- 2011-present: Teaching Assistant, University of Toronto
- Econometrics I and II (PhD)
 - Econometrics (MA)
 - Quantitative Methods in Economics (Undergraduate)
 - Energy and Environmental Economics (Undergraduate)
- 2014: Research Assistant, University of Toronto
- Supervisor: Victor Aguirregabiria
- 2010-2011: Advisor, Gaz Métro, Montreal
- Natural gas demand forecasting

Conferences and Invited Seminar Presentations

- 2016: Congrès de la SCSE (Quebec City); CEA Annual Conference (Ottawa); Doctoral Workshop in Applied Econometrics (Toronto); Empirical Microeconomics Workshop Poster Session (Banff); Canadian Econometrics Study Group Poster Session (London); Fields Institute New Challenges For Big Data in Economics and Finance Poster Session (Toronto)
- 2015 Penn State University Econometrics Seminars; CEA Annual Conference (Toronto); CIREQ PhD Students' Conference (Montreal); Doctoral Workshop in Applied Econometrics (Toronto); Canadian Econometrics Study Group Poster Session (Guelph); Midwest Econometrics Group Annual Meeting (St-Louis)
- 2014 Empirical Microeconomics Workshop (Banff); CEA Annual Conference (Vancouver); CIREQ PhD Students' Conference (Montreal); Doctoral Workshop in Applied Econometrics (Toronto)

Refereeing Experience

Journal of Business and Economic Statistics

References

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Dissertation Abstract

Identification and Estimation of Empirical Games

Games with Unobservable Heterogeneity and Multiple Equilibria: An Application to Mobile Telecommunications (*Job Market Paper*)

This paper deals with the identification and the estimation of empirical games of incomplete information with common-knowledge unobservable heterogeneity and potentially multiple equilibria realized in the data. I introduce outcome variables determined outside of the game to address the endogeneity generated by unobserved heterogeneity. One can then exploit exogenous variation in player-specific unobserved heterogeneity separately from multiple equilibria to identify the primitives of the model. Such variation is particularly helpful in applications where player-specific variables satisfying the exclusion restriction commonly used in the literature are not available. I apply this method to study mobile telecommunications in Canada. I estimate a game in which national incumbents and new entrants choose the number of transceivers they install in different markets. The results highlight sizeable economies of density in transceivers location decisions. Counterfactual experiments shed light on the government's attempt to increase competition in this industry.

Sharp Test for Equilibrium Uniqueness in Discrete Games with a Flexible Information Structure

I propose a test of an assumption commonly maintained when estimating discrete games of incomplete information, i.e. the assumption of equilibrium uniqueness in the data generating process. Most existing tests have been designed for games of pure incomplete information: they ignore information that is known to all players, but unobservable to the econometrician. The test I propose is robust to player-specific common-knowledge unobservables. It makes no parametric assumption on the payoff functions or any distribution of the unobservables. The main identifying assumption is the existence of an observable variable that plays the role of an exclusion restriction. It must (i) have sufficient variation; (ii) be correlated with the common-knowledge unobservables; and (iii) provide only redundant information regarding the players' decisions and the equilibrium selection, were these unobservables actually observed.

Two-Step Semiparametric Estimation of Dynamic Discrete Games: A Comparison of Bias Reduction Techniques

This paper looks at bias reduction in two-step semiparametric estimation of dynamic discrete games. While being computationally simple, two-step methods suffer from poor small sample properties. An iterative approach (the K-step estimator) reduces the finite sample bias, provided that some equilibrium stability conditions are satisfied. Modified versions of the K-step estimator have been proposed to deal with this stability issue. Alternatively, there exists other bias reduction techniques, such as resampling methods, which do not rely on the equilibrium's stability, but have not gotten much attention in this class of models. Using a dynamic game of market entry and exit, I compare the finite sample properties of the K-step approach with alternative methods including several modified K-step estimators, the bootstrap, the jackknife, and a single Newton full maximum likelihood iteration initialized at the two-step estimates. The set of experiments includes data generating processes with stable and unstable equilibria. The results show that, even when the K-step estimator rarely converges to a single point after a large number of iterations, it still reduces the sample bias considerably for small values of K. None of the alternatives considered generates lower root-mean-square errors for all parameters, both in the stable and in the unstable cases.