

MONIKA AVILA MÁRQUEZ

Contact Information

School of Economics
University of Bristol

monika.avilamarquez@bristol.ac.uk
www.monikaavila.com

Fields

Research: Econometric theory for panel data, use of machine learning methods to estimate econometric models.
Teaching: Panel Data Econometrics, Generalized Linear Models, Econometrics, Statistics.

Education

Ph.D. in Econometrics (with congratulations of the jury), University of Geneva 2022
Dissertation: Contributions in the areas of three dimensional panel data and the use of machine learning to estimate econometric models.
Supervisor: Prof. Jaya Krishnakumar.
Committee: Prof. Stefan Sperlich (Chair), Prof. Aleksey Tetenov, Prof. Jeffrey Wooldridge.
Msc. Economics, (Highest Honors) University of Geneva 2016
Orientation: Econometrics
B.A., Economics, (Highest Honors) University Juan Misael Saracho 2008

Fellowships & Awards

Subside Tremplin, University of Geneva 2020-2021
Société Académique de Genève 2018
Scholarship Simon I. Patiño 2014-2016

Research Experience

Postdoctoral researcher in Statistics, MAD, University of Geneva August, 2022 - August, 2023
Research in High-Dimensional Mixed-Effects Models for experimental data.
Research Assistant, Prof. Jaya Krishnakumar, University of Geneva 2016-2022

Professional Experience

Lecturer (Pathway 1: Research and teaching), University of Bristol September, 2023 - present
Tutorials of courses Mathematics, Probability, and Econometrics.
Master Thesis supervision in Economics and Data Science.
Consultant Department of Statistics, International Labour Organization October-November, 2022
Structural vector autoregressive modeling to identify the short-run effect of fertility on the growth of real GDP p.c.
Simultaneous equations modeling to identify the effect of old-age pension coverage on the share of labour in agriculture.
Consultant Department of Statistics, International Labour Organization August, 2022
Statistical analysis of Disability Labour Market data.
Intern Department of Statistics, International Labour Organization 2016
Statistical analysis of Mexican labour data.
Skill mismatch measurement in Mexican labour market.
Development of efficient data analysis tool for labour and migration data of Arab countries.
Sovereign Risk Analyst, Central Bank of Bolivia 2012-2014
Sovereign risk assessment of the foreign exchange reserves investments.
Development of the early warning system.
Use of Bloomberg for news monitoring, assets monitoring, risk monitoring.

Teaching Experience	Teaching Assistant, University of Geneva Graduate Level: Advanced Econometrics, Microeconomics II. Undergraduate Level: Development Economics, Econometrics, Introduction to Econometrics, Introduction to Statistics.	2016-2022
Seminar Presentations	University of Bristol University of Cologne University of Zurich Örebro University Universidad EAFIT University of Gothenburg Universitat de les Illes Balears	2022 2022 2022 2022 2022 2022 2022
Conference Presentations	Encounters in Econometric Theory (Invited speaker), University of Oxford European Economic Association Conference 28th International Panel Data Conference Annual Congress of the Swiss Society of Economics and Statistics 8th Annual Conference of the International Association for Applied Econometrics 27th International Panel Data Conference European Winter Meeting of the Econometric Society Bolivian Conference on Development Economics 26th International Panel Data Conference 25th International Panel Data Conference Swiss Economist Meeting NY Econometrics Camp Swiss Young Economist Meeting 23th International Panel Data Conference	May, 2024 2023 2023 2022 2022 2022 2021 2021 2021 2019 2018 2018 2018 2017
Visiting Scholar	Michigan State University, Prof. Jeffrey Wooldridge	January, 2024.
Refereeing	Journal of Human Development and Capability Association Econometric Reviews Journal of Human Development and Capability Association	2023 2022 2017
Job Market Paper	<p>“Identification and Estimation of Dynamic Heterogeneous Unbalanced Panel Data Models with Clustering”</p> <p><i>Abstract:</i> This paper investigates the identification and estimation of dynamic heterogeneous linear models for unbalanced panel data with known clustering structure and short time dimension (greater than or equal to 3). For this purpose, I use a linear multidimensional panel data model with additive cluster fixed effects and a mixed coefficient structure composed of cluster specific fixed effects and random cluster-individual-time specific effects. For estimation of the mean coefficients, I propose a Mean Cluster-FGLS estimator and a Mean Cluster-OLS estimator. In order to make feasible the GLS estimation of the cluster specific parameters, I introduce a ridge estimator of the variance-covariance matrix of the model. The Mean Cluster estimators are consistent when: i) the number of clusters is fixed, the proportion of observed clusters is equal to 1 and the number of individuals per cluster grows to infinity or when ii) the number of clusters grows at a slower rate than the growth rate of the number individuals per cluster. In addition, I present two extensions of the baseline model. In the first one, I allow for cluster-individual specific fixed effects instead of cluster additive fixed effects. In this setting, I propose a Hierarchical Bayes estimator that takes into account the problem of unknown initial conditions. In the second extension, I allow for cross sectional dependence by including common factors. For estimation of this model, I propose the Mean Cluster estimator using the time demeaned variables. As an empirical application, I present the estimation of a value-added model of learning.</p>	

Publications

“Random Coefficients Models (Updated)” with Jaya Krishnakumar and László Balázs

Matyas L. (eds) The Econometrics of Multi-dimensional Panels. Advanced Studies in Theoretical and Applied Econometrics, 2nd Edition. Springer

Brief abstract: This chapter deals with specification, estimation, and inference within the framework of a random coefficients model for multi-dimensional panel data. Most of the chapter is concerned with a three dimensional setting with an extension to higher dimensions at the end. We discuss several estimation methods, starting with the GLS made feasible by a new estimation procedure for the variance-covariance components as well as an extension of the MINQUE approach. We also derive the full Maximum Likelihood, and a Restricted Maximum Likelihood involving the maximization of a restricted part of the log-likelihood that is free of the intercept and slope coefficients such that we obtain unbiased estimators of the variance-covariance elements. Furthermore, we design specification tests that allow to determine if the response coefficients are constant or varying. Additionally, we present different extensions of the linear model including unbalanced panels, correlated random components, misspecification of the variance-covariance structure, and correlation of the stochastic elements with the regressors. Finally, the chapter ends with brief discussions of non-linear and higher dimensional extensions as well as a simulation experiment comparing the performance of the above methods in a finite sample setting.

Other papers

“Identification and estimation of triangular simultaneous equations models with or without exclusion restrictions: A Machine Learning Approach” with Jaya Krishnakumar

Brief abstract: This paper investigate different identification strategies for triangular simultaneous equations models without exclusion restrictions. We present different identification strategies and exploit machine learning techniques for estimation.

On the use of Machine Learning methods to estimate Triangular Two-level Panel Data Models with Individual Fixed Effects

Brief abstract: This paper investigates the use of random forests to estimate triangular simultaneous equation models for panel data with an additive separable individual specific effect, and an additive separable disturbance term. First, we consider a model composed of a linear structural equation with one endogenous variable. The endogenous variable presents a non linear relationship with the instrumental variables and the exogenous regressors. The parameter of interest is the structural parameter of the endogenous variable. The identification of this parameter is obtained under the assumption of available exclusion restrictions and using a control function approach. The estimation of the parameter of interest is done using two proposed estimators composed of two steps. In the first step, we estimate the nonlinear reduced form equation using random forests and we obtain the residuals. In the second step, we use the residuals as an estimated control function for the endogeneity in the structural equation. Later, we relax the functional form assumption in the structural equation and we consider a semiparametric structural equation. In this new setting, we use random forests to estimate the nonparametric component of the structural equation. We use a Monte Carlo simulation to test the performance of the estimators proposed. We conclude that the estimators perform well provided that we can learn accurately the nuisance parameter in the first-stage.

“Selection of random effects and the variance-covariance structure in mixed models with post-selection inference.” with Katarzyna Reluga, Stefan Sperlich, Olivier Renaud.

Courses

Workshop on Research Design for Causal Inference, Northwestern Law School	2022
Advances in Financial Time Series Modeling, Study Center Gerzensee	2021
Recent Advances in Bayesian Macroeconometrics, Study Center Gerzensee	2019
Numerical Methods, Study Center Gerzensee	2019
Bayesian Econometrics, World Trade Institute	2018
The identification of structural shocks in dynamic models, HEC Lausanne	2018

Computer Skills

Matlab, Python, R, Stata, LATEX, common Windows text processing, spreadsheet, and presentation software, Bloomberg.

Languages

English (fluent), French (fluent), Spanish (native).

References

Professor Jaya Krishnakumar
Institute of Economics and Econometrics
University of Geneva
Uni Mail, Bd du Pont d'Arve 40
1205 Geneva, Switzerland
+41-223798220
Jaya.Krishnakumar@unige.ch

Professor Stefan Sperlich
Institute of Economics and Econometrics
University of Geneva
Uni Mail, Bd du Pont d'Arve 40
1205 Geneva, Switzerland
+41-223798223
Stefan.Sperlich@unige.ch

Professor Aleksey Tetenov
Institute of Economics and Econometrics
University of Geneva
Uni Mail, Bd du Pont d'Arve 40
1205 Geneva, Switzerland
+41-223798220
Aleksey.Tetenov@unige.ch