
JOSÉ BAYOÁN SANTIAGO CALDERÓN

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Education

2019	PhD Economics (anticipated)	Claremont Graduate University
2015	MA Economics	Claremont Graduate University
2014	BA Economics	Southwestern University

Fields of Research

Computational Economics, Political Economy, Statistics

Working Papers

On Cluster Robust Models (Job Market Paper)

Cluster robust models are a tool to obtain estimates of average treatment effects (ATE) when there could be heterogeneity in treatment effects (HTE). Two conditions practitioners should consider when selecting an estimator for ATE with HTE in observational studies are the sampling design and the distribution of the treatment. This study evaluates the performance of the pooling, within, regression-weighted, and interaction-weighted estimators in a series of simulations simultaneously considering the set of conditions. Under random sampling, the various estimators showed similar performance and unbiasedness except for the pooling and within estimator. Under clustered sampling, all estimators showed inconsistency except for the interaction-weighted estimator adapted to use outside estimates rather than sample frequencies. (JEL C01)

The Scope and Impact of Open Source Software:

A Framework for Analysis and Preliminary Cost Estimates

(joint work with Carol A. Robbins, Gizem Korkmaz, Claire Kelling, Stephanie Shipp, and Sallie Keller)

Open source software is everywhere, both as specialized applications nurtured by devoted user communities, and as digital infrastructure underlying platforms used by millions daily. This type of software is developed, maintained, and extended both within the private sector and outside of it, through the contribution of people from businesses, universities, government research institutions, nonprofits, and as individuals. This paper proposes and prototypes a method to document the scope and impact of open source software created by these sectors, thereby extending existing measures of publicly-funded research output. We estimate the cost of developing packages for the open source software languages R, Python, Julia, and JavaScript, as well as re-use statistics for R packages. These reuse statistics are measures of relative value. We estimate that the resource cost for developing R, Python, Julia, and JavaScript exceeds \$3 billion dollars, based on 2017 costs (presented at *IARIW 35th General Conference* and *The Sixth IMF Statistical Forum: Measuring Economic Welfare in the Digital Age: What and How?*).

Bioequivalence.jl

(joint-work from the Center for Translation Medicine at the University of Maryland Baltimore, Massachusetts Institute of Technology and Julia Computing)

As a scientific computing intern, I contribute to the data generation and processing tools for various modeling designs (e.g., PK/PD, PBPK, QSP) and for conducting bioequivalence studies. The code will be released in early 2019 as open-source. Project under the supervision of professor Vijay Ivaturi and Chris Rackauckas. For information, please watch the base package presentation from JuliaCon PuMaS.jl: Pharmaceutical Modeling and Simulation Engine.

Econometrics.jl

An open-source statistical package for the Julia language with support for general econometrics routines. Some of the features include regression analysis with continuous, categorical (nominal and ordinal), count, and survival outcomes, instrumental variable models, weights, variables absorption, random effects, and robust variance covariance estimators.

Recommender Systems and Learning in Competitive Markets

What is the effect of recommender systems on individual learning and the emergent effects of such processes on population dynamics? Some of the aspects explored include heterogeneous agents, behavioral biases, and reputation concerns. Predictions are explored and nuanced based on agent-based modeling simulations and Bayesian statistical methods.

Skills

Programming Languages: R, Julia, Python, Stata, ArcGIS Pro, NetLogo

Areas of Expertise: Econometrics, Machine Learning, Natural Language Processing (NLP)

Experience

QuantEcon

I am a member of the team developing and maintaining the QuantEcon lectures for the Julia language and related code (e.g., QuantEcon.jl). The undergraduate and graduate level lectures cover various topics in quantitative economics. The code is available at the Github repository (open-source). Working with the University of British Columbia team led by professor Jesse Perla.

Graduate Fellow for the Data Science for the Public Good Program
Social and Decision Analytics Laboratory (2018)

I led two research projects and consulted for a third one under the supervision of Dr. Gizem Korkmaz. My responsibilities included working with the sponsor and undergraduate students tasked to these projects. Poster presentations for the symposium are available under presentations.

Research Consultant and Data Scientist

Res-Intel, a wholly-owned subsidiary of Policy Consultants, LLC (2016 – 2018)

I assisted with analytical modeling and software integration. Some of my experiences include working in the team that developed the data validation and preprocessing for the analytic tools provided in the software. My work focused on the designed and implementation of the algorithms used in prediction and benchmarks for energy and water utility accounts. These analytics were used for large-scale A/B tests using nudges. Other projects included program evaluations such as of the Southern California Edison's California Advanced Home Program. Worked under the supervision of professor Hal Nelson (Portland State University).

Center for Neuroeconomics Studies (2014 – 2016)

I performed various roles such as: recruiting participants, conducting design-stage research, piloting laboratory experiments, running experiments, and cleaning and analyzing data. The laboratory experiments included administering drugs, collecting blood samples, eye-tracking, electroencephalogram (EEG), electrocardiogram (ECG), and standard experimental laboratory studies.

Teaching (Assistant)

2016 Advanced Research Methods (Graduate), Michigan State University

2015 Principles of Microeconomics (AP), Johns Hopkins University

2014 Intermediate Microeconomics (Undergraduate), Southwestern University

2014 Principles of Economics (Undergraduate), Southwestern University

Certificates

2019 Preparing Future Faculty Certificate in College Teaching (expected)

2017 Statistics with R, a 5-course specialization by Duke University on Coursera

2017 Machine Learning, a 4-course specialization by University of Washington on Coursera

2016 Fundamentals of Computing, a 7-course specialization by Rice University on Coursera

2015 Data Science, a 9-course specialization by Johns Hopkins University on Coursera

Presentations

José Bayoán Santiago Calderón, Keren Chen, Hannah Brinkley, Eirik Iversen, Daniel Chen, and Gizem Korkmaz. 2018. "Measuring the Cost and Value of Open Source Software." In *Data Science for the Public Good Program Symposium*. Arlington, VA, August 9. <https://bit.ly/jbsc-dspg-2018-nsf-oss>

José Bayoán Santiago Calderón, Hannah Brinkley, Alexa Nosal, Kelsey McMahon, Megan Grondine, Aaron Schroeder, and Gizem Korkmaz. 2018. “Evaluating the Impact of the Arlington Restaurant Initiative on Alcohol-Related Crimes in Clarendon.” In *Data Science for the Public Good Program Symposium*. Arlington, VA, August 9. <https://bit.ly/jbsc-docs-dspg-2018-acpd-ari>

References

Tom Kniesner (Chair - Placement Director)	Monica Capra (Committee Member)
Professor	Professor
Department of Economic Sciences	Department of Economic Sciences
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