

Rodrigo Azuero Melo

Amazon.com
Customer Behavior Analytics

Phone: (202) 701-8419
Email: razuero@amazon.com

Citizenship: Colombia. US Permanent Resident.

I am an economist working in causal inference, causal ML, and econometrics with international experience leading projects in the tech industry, academia, and government agencies. I am an Advanced coder in Python, R, Julia, Spark, among other programming languages. Author of various R-packages including [gmapsdistance](#), a package to compute distance and travel time between multiple points using the Google Maps Distance API: 55,000 total downloads. Field experience in survey design in Latin America and the Caribbean. Dialogue with policymakers in Peru, Colombia, Ecuador, Mexico, and the Dominican Republic.

Education

- Ph.D. Economics, University of Pennsylvania, 2012-2017.
- M.A. Economics, University of Pennsylvania, 2015.
- M.A. Economics, Universidad de los Andes, Bogota, 2011.
- B.Sc. Economics, *Cum Laude* (Top 3% GPA of last 5 years). Minor: History. Universidad de los Andes, Bogota, 2009.

Career Experience

- **Amazon.com.** Economist II. 2020 - current position.

Economist at the Customer Behavior Analytics team. I work in the development of causal machine learning models to estimate the effect of customers' actions on Amazon downstream behavior. I also provide technical training to the DSI science team in topics related to causal machine learning, causal inference, and econometrics.

- Real-Time provision of Causal Estimates (RTCE). I lead a project providing real-time estimates of causal estimates to different organizations across Amazon. The goal is to obtain heterogeneous treatment effects of different actions that customers can take on long-term customer behavior in latencies not exceeding the milliseconds.
- Downstream Impact Profit and Losses (DSI P&L) team member. I am one of three science team members working for a senior-vice-presidency goal, the highest ranked goals in Amazon.com, where we aim to provide downstream impact estimates that are compatible with P&L reports. In this goal, I am in charge

of developing the econometric strategy to estimate the downstream impact of single-actions as well as taking this methodology to production.

- Forward-Facing DSI team member. I currently work in the development of predictive - causal ML models so that programs within Amazon that have been recently launched can predict the causal effect on customer behavior in the long term.
- Other: I am the co-organizer of the Amazon Machine Learning Conference (AMLC) - Workshop on Causal Inference. Internal presentations in Amazon including Consumer Science Summit, AMLC. I also provide training sessions related to Double Machine Learning (DML) and causal inference to technical and non-technical audiences.

- **Emory University. Department of Quantitative Theory and Methods**

2019 - 2020. Visiting Professor. (On sabbatical from the Inter-American Development Bank).

The Quantitative Theory and Methods (QTM) department at Emory University was launched in the Fall of 2019 with the goal of promoting the research and teaching of data science across various disciplines. QTM professors include faculty from computer science, mathematics, economics, biology, among other disciplines.

- Professor of Introduction to Causal Inference. In this class students are introduced to basic notions of causal inference such as the potential outcomes framework, experimental design, and obtaining causal estimates from experimental data.
- Faculty leader for three capstone projects. I led three interdisciplinary projects in partnership with the Inter-American Development Bank related to the use of data-analytics to prevent tax fraud and corruption in Peru, Colombia, and the Dominican Republic.

- **Inter-American Development Bank:**

Economist: 2017 - 2020. Consultant on various occasions between 2010 - 2017.

The Inter-American Development bank is a multilateral organization based in Washington, DC. With a total ordinary capital amounting to US\$101 billion, it is the largest source of development financing for Latin America and the Caribbean.

- Team leader of a research agenda aimed at implementing data-analytics tools to identify and prevent tax fraud and corruption in Latin America and the Caribbean with a budget of approximately \$300,000. Team member in policy-based loans totaling \$500 MM related to data analytics for fiscal management in the region. In charge of the Fiscal Management Division of the Bank in December, 2018.
- Led the econometric analysis of a large experimental intervention in Ecuador aimed at identifying the development of skills in young children. I was also the team leader training a total of 50 enumerators for the development of this intervention. Experience in survey design for multiple countries in the region.

- **Universidad de los Andes. Economics department.** Researcher: 2009-2010.
 - Developed computational files for the book ([“A Practical Guide for Causal Inference”](#) (In Spanish)).

Volunteer Experience

- **The Citizen’s Branch** ([La Rama Ciudadana](#), in Spanish). I co-founded this initiative in 2016 with the goal to contribute to the public policy debate in Colombia through extensive data analysis related to various topics of major relevance in Colombia.
 - **Major goal.** We identified, processed, and presented absenteeism data of congressmen in Colombia’s Senate for the legislative period of 2014-2018. This project got coverage in all the major news organizations in Colombia and was influential in determining the regulation of minimum assistance of Colombia’s senators.
- Press coverage** (in Spanish). [El Espectador](#), [Semana](#), [El Colombiano](#).

Publications

- Schady, N; Azuero, R *et al.* (2015). [“Wealth Gradients in Early Childhood Cognitive Development in Five Latin American Countries”](#). *Journal of Human Resources*, 50(2):446-463.

Working Papers

- Azuero, R. (2019). [“Evaluating Early Childhood Policies: An Estimable Model of Family Child Investments”](#). R&R. *Quantitative Economics*.
- Azuero, R. & Zarruk, D. (2019). [“The Effects of Student Loans on the Provision and Demand for Higher Education”](#). [slides]
- [Are Medium Sized Businesses in Peru on the “Wrong” Side of the Laffer Curve?](#) (2019). With Alejandro Lagomarsino (Harvard University), Mariano Bosch (IDB).
- [Optimal Taxation and Informality](#). (2019). With Juan Hernández (IDB) and Daniel Wills (Universidad de los Andes).
- [Special Tax Regimes in Latin America and the Caribbean. Compliance, Social Protection, and Resource Misallocation](#). (2019). With Jesica Torres, Mariano Bosch, and Oliver Azuara.
- [A Model of Value-Added Taxes](#). (2019). With David Zarruk (ITAM), and Daniel Wills (Universidad de los Andes).
- [Productivity, Misallocation, and Special Tax Regimes in the Dominican Republic](#). (2019). With Mariano Bosch, Marvin Cardoza, and Dennis Sanchez.

Teaching Experience

- **Instructor:**

- **Emory University.** Department for Quantitative Theory and Methods. Introduction to Scientific Methods. (Fall, 2019).
- **Inter-American Development Bank:** Machine Learning (Spring, 2019) [Link to course materials](#).
- **University of Pennsylvania:** Introduction to Microeconomics (Summer, 2015)
- **Universidad de los Andes:** Stata workshop (Spring, 2010)

- **Teaching Assistant:**

- **University of Pennsylvania:** Introduction to Microeconomics, Introduction to Statistics, Intermediate Microeconomics.
- **Universidad de los Andes:** Econometrics for Impact Evaluation (Graduate level), Statistics I for Social Sciences, Integral Calculus, Microeconomics III, Differential Calculus, Game Theory, Introduction to Economic Theory (Graduate level),
- **Universidad Externado de Colombia:** Introduction to Mathematics for Lawyers.

Presentations

- **2017-2022**

- Consumer Science Summit (Amazon), Amazon Machine Learning Conference Workshop on Causal Inference, University of South Carolina, Arizona State University, American Institutes for Research, Universidad del Rosario (Colombia), IMPAQ International, NERA Economic Consulting. Economics of Informality (Universidad del Rosario, Bogota); 1st Conference of Colombian Economics Meetings (Universidad de los Andes), Machine Learning Applications for Development (Inter-American Development Bank).

- **2014-2016**

- [EMCON](#): Empirics and Methods in Economics, Northwestern University., University of Pennsylvania: Empirical Micro Seminar. Universidad Católica de Chile. Workshop on Early Childhood Development. [ECONCON](#). Conference sponsored by Columbia University, New York University, Princeton University, University of Pennsylvania and Yale University. [LACEA](#): Latin American and Caribbean Economics Association Annual Meetings.

Student Advising

- Graduate Program in Impact Evaluation. Universidad de los Andes
 - Rojas, L. A. & Casas, C. The Impact of “Comedores Comunitarios” on Nutritional Outcomes. Grade: 5.0/5.0

Grants

- Inter-American Development Bank Economic Sector Works Research Grant.
 - Tax Policy, Informality, and Productivity in Latin America and the Caribbean?
 - Using Data Analytics to Improve Tax Compliance
- School of Arts and Sciences Conference Grant. University of Pennsylvania. (2016).
- Penn Institute for Economic Research. Stipend Matching Grant. (2015).
- Latin American and the Caribbean Economic Association (LACEA). Grant to present at the annual LACEA meetings in Santa Cruz, Bolivia, 2015.
- Graduate and Professional Student Association (GAPSA) Travel Grant. University of Pennsylvania. 2015.
- Tilburg University study abroad program. Econometrics Certificate. (90% of tuition). 2008.

Honors, Awards, & Fellowships

- Judith Rodin Fellow. Fellowship awarded to doctoral students in the Social Sciences who are committed to nation-building. 2016
- University of Pennsylvania Fellowship. 2012-2017.
- *Cum Laude*. Universidad de los Andes. Awarded to students with GPA located in the top 3% of the department during the last 5 years. 2009.

Professional Activities

- Referee: *International Economic Review*, *Journal of Labor Economics*, *Economia*.
- Book Reviewer: Universidad de los Andes, Economics

Languages

- English (Fluent), Spanish (Native), French (Advanced)

Programming Skills

- Fortran, Matlab, Python, Stata, R, Rcpp, C++, OpenMP, Julia, Cuda, SQL, Spark.

Software

- [gmapsdistance](#): R-package to compute distance and travel time between multiple points using the Google Maps Distance API. 50,000 downloads.
- [Rtauchen](#): R-package to discretize an AR(1) process following Tauchen (1986). A discrete Markov chain that approximates in the sense of weak convergence a continuous-valued univariate Autoregressive process of first order is generated. It is a popular method used in economics and in finance.

Certificates

- Econometrics Certificate, Tilburg University, Spring 2008.
- [Machine Learning Certificate](#). Stanford University on Coursera. 2018.
- [Neural Networks and Deep Learning](#). . deeplearning.ai on Coursera. 2019.
- [Version Control with Git](#). Atlassian University. 2020
- [SQL for Data Science](#). UC Davis on Coursera. 2020

Additional Information

- Github profile: <https://github.com/rodazuero>
- Linkedin profile: <https://www.linkedin.com/in/rodrigo-azuero/>

Last updated: January 13, 2022