

ELIZABETH SANTORELLA

elizabeth.santorella@gmail.com \diamond esantorella.com

EDUCATION

- Harvard University** *May 2018*
PhD Economics
Research focus: econometrics, education, and public economics
- Harvard University** *November 2015*
M.A. in Economics
- Massachusetts Institute of Technology** *June 2013*
S.B. in Physics & Economics
Physics concentration in computer science
GPA: 4.9 / 5.0

RECENT EXPERIENCE

- QuantCo** Economist / Data Scientist
Full time December 2017 - present
Part time December 2015 - May 2017 *Boston, MA*

- Owner of a product that estimates a crucial input to pricing over \$2 billion of revenue.
 - Transformed ad-hoc Matlab code into an automated Python machine learning pipeline that runs at two e-commerce clients.
 - Did model selection, performance optimization, causality verification, and productionization.
 - Profit, revenue, and model fit substantially improved according to KPIs chosen with the client.
- As a start-up employee, I wear many hats:
 - Pricing strategy
 - Experiment design
 - Recruiting
 - Helping set priorities
 - Advising
 - Evangelizing best practices

RESEARCH

Multi-Dimensional Teacher Effects

- I estimate the covariance structure of teacher effects on several outcomes: present and future test scores, present and future attendance, and high school graduation. Teachers have substantial effects on high school graduation, and on test scores and attendance four years in the future. However, long-term effects cannot be predicted well by short-term effects.

Which Value-Added Estimator Works Best and When?

- As value-added estimation spreads to fields outside education, where data sets may be small and experimental validation infeasible, estimators that perform well without millions of observations are increasingly needed. I clarify conditions under which existing methods are identified, sign their biases, and derive asymptotic standard errors, and develop a likelihood-based estimator. Monte Carlo experiments show that the likelihood-based estimator nearly eliminates bias without increasing variance, and that confidence intervals based on the asymptotic distribution of the estimator give approximately correct coverage.

Bureaucrat Value Added: The Effect of Individual Bureaucrats on Local Economic Outcomes in India

with Jonas Hjort and Gautam Rao

- We use several value-added estimators to study a question relevant to political economy: How much agency do individual bureaucrats have to impact local economic performance? We study high-ranking bureaucrats in the Indian Administrative Service, India's national bureaucracy. These bureaucrats, District Collectors, are quasi-randomly assigned to manage the bureaucracy of an Indian district and often transfer to different districts in the same state. This setting, with relatively few observations and high-dimensional covariates, presents econometric challenges. While point estimates suggest that District Collectors are an important cause of variation in project completion and night light intensity, randomization inference shows that our estimates are in fact insignificant.

SKILLS

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| Computer Languages | Python (Numpy, Pandas, Scikit-Learn); R; SQL; Matlab; Stata |
| Other Skills | Econometrics, machine learning, technical writing, performance engineering, numerical optimization, teaching |

OLDER WORK EXPERIENCE

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| Harvard Economics Department <i>Econometrics Teaching Fellow</i> | January 2016 - May 2016 Cambridge, MA |
| Harvard Kennedy School of Government <i>Microeconomics Teaching Fellow</i> | September 2015 - December 2015 Cambridge, MA |
| Massachusetts Institute of Technology <i>Microeconomics Tutor</i> | February 2013 - May 2013 Cambridge, MA |
| Abdul Latif Jameel Poverty Action Lab <i>Undergraduate Research Assistant</i> | January 2012, June 2012 - August 2012 Cambridge, MA |
| MIT Computer Science and Artificial Intelligence Laboratory <i>Web Developer</i> | June 2011 - August 2011 Cambridge, MA |

HONORS

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|------------------|---|
| 2015-2016 | Subir Chowdhury Fellowship on Quality & Economics |
| 2015 | On third place team, world Econometric Game |
| 2014-2015 | Rita Ricardo-Campbell Fellowship in Economics |
| 2013-2014 | Harvard University Graduate Student Fellowship |
| 2013 | Phi Beta Kappa |
| 2013 | Sigma Pi Sigma (physics honor society) |