

# David Zarruk Valencia

347 W 123rd Street, Apt. 3, New York, NY 10027  
+1 (267) 474-6472

✉ davidza@sas.upenn.edu | 🏠 www.davidzarruk.com | in davidzarruk | 🐙 davidzarruk

## EDUCATION

---

**University of Pennsylvania**, Philadelphia, PA

Ph.D. in Economics

Expected May 2018

M.A. in Economics

May 2017

**Universidad de los Andes**, Bogotá, Colombia

M.A. in Economics

Aug 2013

B.A. in Mathematics

Mar 2013

B.A. in Economics (cum laude)

Mar 2011

## INTERESTS

---

Macro-finance, Taxation, Inequality and Heterogeneous Households Models

## RESEARCH

---

*Wall Street or Main Street: Who to Bail Out?* 2017. [Job Market Paper]

Housing crises are characterized by an increase in foreclosure rates that generate losses to mortgage investors. To preserve their solvency, governments have historically implemented two policies: a) offer bailouts to investors (Wall Street), and b) offer subsidies to mortgage refinancing of households to prevent additional foreclosures (Main Street). This paper studies the welfare maximizing bailout-subsidy policy for the case of the Great Recession, shaped by two frictions: a dead-weight loss of 20% on the house value that occurs during the foreclosure process and an information friction on individual house prices that generates strategic default to access subsidy programs. I quantitatively assess the welfare maximizing policy in a heterogeneous agents' economy and find that a subsidy-only policy would have generated welfare gains of up to 0.4%, measured as consumption equivalent variation, as compared to the baseline calibration that matches TARP and HAMP programs. In contrast, a bailout-only policy would have generated welfare losses of 0.8%.

*A Practical Guide to Parallel Computing in Macroeconomics*, with Jesús Fernández-Villaverde, 2017.

Parallel computing opens the door to solving and estimating richer models in Economics. From dynamic optimization problems with high dimensionality to structural estimation with complex data, readily-available and economical parallel computing allows researchers to tackle problems in Economics that were beyond the realm of possibility just a decade ago. This paper describes the basics of parallel computing for economists, reviews widely-used implementation routines in Julia, Python, R, Matlab, C++ (OpenMP and MPI) and CUDA and compares performance gains using as a test bed a standard life-cycle problem such as those used in macro, labor, and other fields.

*The Effects of Student Loans on the Provision and Demand for Higher Education*, with Rodrigo Azuero, 2016.

This paper characterizes the general equilibrium outcomes of the tertiary education market in a context where borrowing constraints bind, there is a two-tier college system operating under monopolistic competition in which colleges differ by quality and returns to education depend on school quality. The paper shows that a widening of the gap in quality supplied by tertiary education institutions can be a by-product of subsidized student loan policies and illustrates the main results through a numerical exercise applied to the case of Colombia, which underwent a rapid expansion in the supply of subsidized student loans during the past decade.

## TEACHING EXPERIENCE

---

**University of Pennsylvania**, Philadelphia, PA

*Instructor*

Math Camp for Economics and Wharton Finance Ph.D. (ECON 897)

Summer 2015, 2016

*Teaching Assistant*

Macroeconomic Theory II for Economics Ph.D. (ECON 704)

Springs 2014, 2015

Monetary and Fiscal Policy (ECON 243)

Fall 2014

**Universidad de los Andes**, Bogotá, Colombia

*Instructor and Teaching Assistant*

Introduction to MATLAB (2013), Advanced Microeconomics: Game Theory (2012), Microeconomics II (2012), Advanced Macroeconomics: Long Run (2011), Linear Algebra I (2011) and Mathematical Methods for Economists (2011)

## CONFERENCES AND PRESENTATIONS

---

George Washington University Student Research Conference in Economics, Washington D.C.

Spring 2017

21<sup>st</sup> Annual LACEA Meeting, Medellín, Colombia

Fall 2016

## PROFESSIONAL EXPERIENCE

---

**University of Pennsylvania**, Philadelphia, PA

Aug 2013 – Present

*Research Assistant*

- Research assistant for Prof. Jesús Fernández-Villaverde (Aug 2016 – Jul 2017)
- Research assistant for Profs. Ufuk Akcigit and Jeremy Greenwood on paper *Buy, Keep or Sell: Economic Growth and the Market for Ideas*, Econometrica, 2016
- Coded GitHub repository with using parallel computing in R, Python, Matlab, Julia, C++ (OpenMP, MPI), CUDA (GPU)
- Co-authored and currently maintain R package *Rtauchen* to discretize AR(1) processes following Tauchen (1986)
- Extended R package *gmapsdistance* to allow for options such as arrival time and enabled multiple origins/destinations
- Led workshop on R and C++ (*Rcpp* package) at Federal Reserve Bank of San Francisco (Jul 2017)
- Elected as one of three members of Graduate Economics Society responsible for Department's social events

**La Rama Ciudadana** ([laramaciudadana.com](http://laramaciudadana.com)), Remote

Jun 2016 – Present

*Co-Founder*

- Designed website to disseminate Colombian statistics on various topics through use of data scraping and visualization
- Scraped data on attendance to 2K+ Congress sessions for Congressmen using Python and developed visualizations in R
- Scraped 15K+ sites with academic publications of universities using R and developed visualizations
- Achieved wide press coverage on mainstream newspapers and radio stations

**Ministerio de Educación Nacional**, Bogotá, Colombia

Jun 2015

*Summer Advisor*

- Developed policy recommendations for the 10-Year National Education Plan
- Projected costs of Colombian high school system based on probabilistic model of teacher ranking promotions
- Elaborated document with distribution and characteristics of high school teachers in Colombia

**Universidad de los Andes**, Bogotá, Colombia

Mar 2011 – Jun 2013

*Research Assistant*

- Performed econometric analyses and estimation of models related to conflict, crime, education and poverty
- Elaborated policy recommendations to National Planning Department to increase income and land access of rural households
- Estimated costs of programs to displaced population for Ministry of Finance
- Assembled datasets using administrative data with 28M+ entries on school attendance and crime

## HONORS AND AWARDS

---

**Federal Reserve Bank of San Francisco**, San Francisco, CA  
Dissertation Fellowship

Summer 2017

**University of Pennsylvania**, Philadelphia, PA  
Dissertation Completion Fellowship  
Judith Rodin Fellowship  
Best Preliminary Econometrics Exam

Aug 2017  
May 2016  
Sep 2014

**Universidad de los Andes**, Bogotá, Colombia

M.A. scholarship Awarded to Best National Exam of Undergraduate Quality (ECAES) of Universidad de los Andes  
Academic Excellence Scholarship (GPA: 5/5)  
Cum laude degree in Economics

Jun 2011  
Apr 2011  
Mar 2011

## REFeree EXPERIENCE

---

International Economic Review

## SKILLS AND LANGUAGES

---

### Languages:

Spanish (native), English (proficient), Portuguese (intermediate), Italian (basic)

### Programming:

Proficient: C++, R, Matlab, VBA, Stata, Linux, OpenMP, CUDA  
Basic: Java, Python, MPI

## REFERENCES AND DISSERTATION COMMITTEE

---

Jesús Fernández-Villaverde (Advisor)  
University of Pennsylvania  
3718 Locust Walk, 440 McNeil Building  
Philadelphia, PA, 19104  
Phone: +1 (215) 898-1504  
Email: [jesusfv@econ.upenn.edu](mailto:jesusfv@econ.upenn.edu)

Dirk Krueger (Advisor)  
University of Pennsylvania  
3718 Locust Walk, 511 McNeil Building  
Philadelphia, PA, 19104  
Phone: +1 (215) 573-1424  
Email: [dkrueger@econ.upenn.edu](mailto:dkrueger@econ.upenn.edu)

Guillermo Ordóñez (Committee)  
University of Pennsylvania  
3718 Locust Walk, 428 McNeil Building  
Philadelphia, PA, 19104  
Phone: +1 (215) 898-1875  
Email: [ordonez@econ.upenn.edu](mailto:ordonez@econ.upenn.edu)