Robert Baluja

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Research Fields

Environmental Economics, Labor Economics, Industrial Organization

Education

University of Arizona — Tucson, AZ
Ph.D. (M.A. en route) - Economics — *Expected 2025*

Columbia University — New York, NY
PER-IO Graduate Student Visitor, Department of Economics — *2023*

University of California, San Diego — La Jolla, CA
B.S. - Mathematics & Economics; Summa Cum Laude — *2020*

MiraCosta Community College — Oceanside, CA
A.S. - Business Administration — *2018*

Working Papers

Escape the Heat: The Dynamics of Migration as Adaptation to Climate Change

Earth's climate is changing, which is widely expected to drive net reductions to human welfare. In this paper, I study how effectively migration will reduce experienced climate damages. To provide answers to my research questions, I develop and estimate a dynamic lifecycle model of migration within Mexico. I combine this with a non-stationary and spatially varying model of the climate, in which I allow for both fully informed and naive expectations of the future progression of climate change. Estimation of the climate model uses daily-level historical weather data and output from state-of-the-art climate simulations. Estimation of the lifecycle model uses a sample of life histories, covering the years 1950–2019, and follows a nested full solution pseudo-maximum likelihood routine. I find that climate damages from business-as-usual warming would be 28% higher if domestic migration within Mexico was no longer available as a tool of adaptation to climate change. Moreover, the fraction of the population that I estimate as forming naive expectations of the climate system would experience an average of 2% less lifetime climate damages from becoming fully informed on the climate transition. Given that most of the increased damages this population faces come from a reduced propensity to migrate, one way to reduce these losses is to subsidize migration. I find that subsidizing migration at the average level of the internality reduces their welfare losses by 8–19%. The exact value of this reduction depends on whether the policy forces people to use the subsidy in a particular period. Policies that allow individuals to choose when to use them are over twice as valuable to the affected population because they do not overly incentivize dynamically suboptimal moves. This sort of dynamically-available policy is common; examples include provisions from the recent Inflation Reduction Act and first-time homeowners tax credits.

PFAS-Contaminated Drinking Water Harms Infants

with Bo Guo, Wesley Howden, Ashley Langer, and Derek Lemoine
Resubmitted to *Science*

There is evidence of widespread human exposure to per- and polyfluoroalkyl substances (PFAS) but limited evidence of the human health impacts of this exposure. Using data on New Hampshire births from 2010–2019, we show that mothers receiving water that had flowed beneath a PFAS-contaminated site, as opposed to comparable mothers receiving water that had flowed towards a PFAS-contaminated site, had 191% [95% CI: 83–298%] higher first-year infant mortality (611 [268–955] additional first-year deaths per 100k births); 168% [42–294%] more births before 28 weeks of gestational age (466 [116–817] additional such births per 100k births); and 180% [57–302%] more births with weight below 1,000 g (607 [192–1022] additional such births per 100k births). Extrapolating to the contiguous U.S., PFAS contamination imposes annual social costs of approximately $8 billion. These health costs are substantially larger than current outside estimates of the cost of removing PFAS from the public water supply.

Work in Progress

Mitigating the Impact of Climate Change on Educational Outcomes

How can access to microfinance help individuals remain in school? Data shows that poor agricultural outcomes, measured by harmful degree days, lead individuals to drop out of school at increased rates. I use data from the Indonesian Family Life Survey and a dynamic lifecycle model of education and occupation decisions under a family-level budget constraint in the face of climate change to understand how targeted microloans can mitigate such impacts. Key components of the model include a budget constraint influenced by stochastic weather draws from a non-stationary climate distribution, specialized experience accumulated over time, and costly switching between occupations. The model also assumes equilibrium wages across sectors. Using the estimated model, I investigate how targeted microloans impact individuals' decisions to stay in school during years when they might otherwise drop out to supplement their family income. I also examine how such a market might influence the long-run distribution of education and occupational choices in the country.

Powering the Market for Environmental Permits
with Ashley Langer

In this paper, we study the role of market power in a cap-and-trade setting. Instead of focusing solely on potential distortions in the output market, we concentrate on the ability of firms to manipulate the prices of permits: an input to production. We examine the market for tradable sulfur dioxide permits in the Eastern United States from 1995 to 2003. Our findings confirm the decreased investment in costly SO2 abatement technologies by recently restructured plants compared to those under rate-of-return regulation, as observed by Fowlie (2010) and Cicala (2015). We extend their analyses by identifying that firms with potential power to manipulate permit prices are 14.3 percentage points less likely than fringe firms to invest in pollution abatement in regulated markets, but 26.0 percentage points more likely to invest in pollution abatement in restructured markets. This reallocation of SO2 emissions, a local pollutant, raises important distributional questions. Moreover, we explore how the ability to manipulate permit prices through costly investment relates to the theoretical equivalency between taxes and cap-and-trade. To address these questions, we develop a multi-stage dynamic model of investment under uncertainty with an endogenous market for pollution permits.

Presentations

2024: AERE Summer Conference, University of Arizona Econometrics Lunch
2023: AERE@OSWEET, AERE@WEAI, AZ ENREE Workshop, Columbia University IO Colloquium, Sacramento Economics Roundtable, 2nd Summer School on the Economics of Migration
2022: CU Environmental & Resource Economics Workshop
2019: UCSD Faculty Mentor Program Symposium, UCSD Undergraduate Research Conference

Grants and Awards

2024: Dror Research Excellence Award, AERE Travel Scholarship, GPSC Travel Grant
2023: AEA Mentoring Program Travel Grant
2022: Steve Manos Prize for Best Second-Year Paper, GPSC Travel Grant
2020: Phi Beta Kappa

Research Experience

Research Assistant — University of Arizona
Prof. Ashley Langer — *Spring 2022 - Present*

Research Assistant — University of Arizona
Prof. Derek Lemoine — *Spring 2022 - Fall 2023*

Research Assistant — University of California, San Diego
Prof. Philip Roeder — *Spring 2019*

Teaching

Instructor of Record

Microeconomic Analysis for Business Decisions - Spring 2025 (Online)

Macroeconomic and Global Institutions and Policy - Summer 2024 (Online)

Basic Economic Issues - Summer 2023 (In-Person)

Teaching Assistant

Environmental Economics - Spring 2024

Economics of Sports - Spring 2023

Mathematical Economics (PhD) - Fall 2021, Fall 2022

Math Camp (PhD) - Summer 2022

Economics of Strategy - Fall 2020, Spring 2021

Climate Science & Economics: How Should Policy Control Warming? - Fall 2021

Basic Economic Issues - Fall 2020

Skills Summary

Programming Languages: Julia, Python, R

(Non-Programming) Languages: English (Native), Spanish (Conversational)

References

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