

HARSHIL SAHAI

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Education

The University of Chicago , MA, PhD, & Postdoctoral Scholar in Economics	<i>2017–present</i>
Swarthmore College , BA in Economics & Mathematics	<i>2011–2015</i>

References

Professor Michael Greenstone (Chair)
The University of Chicago
Kenneth C. Griffin Department of Economics
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Professor Michael Kremer
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Professor Michael Dinerstein
The University of Chicago
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Research and Teaching Fields

Primary: Development Economics, Environmental Economics

Job Market Paper

The Welfare Implications of School Voucher Design: Evidence from India ↗

Winner: *National Academy of Education / Spencer Dissertation Fellowship*

Abstract: While school voucher policies are common, their designs vary dramatically across the world. This paper studies the impact of these design choices on students, schools, and overall welfare using novel data from India – the largest primary school voucher program in the world – where schools must participate, cannot charge extra fees, and receive payments linked to their tuition. Voucher lotteries suggest recipients benefit from lower tuition expenses and greater school choice. However, because school payments are linked to tuition, schools respond by strategically raising tuition fees, impacting millions of children who are outside the voucher system. To understand the policy’s full equilibrium impact, the paper develops a model of demand and supply in which students’ enrollment choices and schools’ price and quality decisions are endogenous to voucher design. On net, welfare estimates based on revealed-preference show that the policy’s benefits exceed costs (1.5 to 1), while also reducing measures of segregation. A failure to account for the impacts to non-recipients, however, would have overstated the benefit-cost ratio by a factor of two (2.9 to 1). Finally, changing the policy design has large implications: allowing schools to charge extra fees or opt out would substantially reduce its net benefits, while switching to a “flat” voucher would substantially increase them.

Publications

Indoor Air Quality, Information, and Socio-Economics Status: Evidence from India

(with Patrick Baylis, Michael Greenstone, and Kenneth Lee)

American Economic Association: Papers & Proceedings, May 2021

Abstract: In Delhi, one of the world's most polluted cities, there is relatively little information on indoor air pollution and how it varies by socioeconomic status (SES). Using indoor air quality monitors (IAQMs), we find that winter levels of household air pollution exceed World Health Organization standards by more than 20 times in both high- and low-SES households. We then evaluate a field experiment that randomly assigned monthlong IAQM user trials across medium- and high-SES households but suffered from significant survey non-response. Among respondents, IAQMs did not affect take-up of subsidized air purifier rentals or other defensive behavior.

Working Papers

Long-range Forecasts as Climate Adaptation: Experimental Evidence from Developing-Country Agriculture

(with Fiona Burlig, Amir Jina, Erin Kelley, and Greg Lane)

Accepted Pre-Results at *Journal of Development Economics*, April 2022

Abstract: Climate change is making weather more variable, exacerbating agricultural risk in poor countries. Increasingly, risk-averse farmers are unable to tailor their planting decisions to the coming season, and underinvest in profitable inputs. Accurate, long-range forecasts enable farmers to optimize for the growing season ahead. We experimentally evaluate monsoon onset forecasts in India, randomizing 250 villages into control; a forecast group receiving information well in advance of onset; and an index insurance group which serves as a benchmark. Forecast farmers update their beliefs and their behavior accordingly: farmers who receive “bad news” relative to their priors substantially reduce land under cultivation and certain input expenditures, while those receiving “good news” significantly increase input expenditures. The forecast also changes crop choice, as farmers tailor their investments. These changes in *ex ante* investments lead to meaningful changes in *ex post* outcomes. Machine learning-based heterogeneity shows that the least well-off farmers experience the largest increase in agricultural profits from the forecast. In contrast to the forecast, insurance, which provides no information about the coming season, increases investments but does not change crops. Our results demonstrate that forecasts are a promising tool for climate adaptation.

Social Networks and Internal Migration: Evidence from Facebook in India

(with Michael Bailey)

Abstract: Despite potentially large economic returns, rates of internal migration remain low in many developing countries. This paper uses new, de-identified data from Facebook to quantify the role of social networks in explaining this development puzzle. We study this question in India, a country that exhibits substantial wage dispersion across regions but remains relatively under-urbanized. Detailed records of nearly 20 million individuals on the evolution of social connections and residential choice reveal that networks and migration are strongly linked. Across several identification strategies, a model of migration suggests that social networks account for roughly 20% of relationship between migration and distance. We develop a simple, static model of spatial equilibrium, which suggests that equalizing social connections across locations increases average wages by 3% (24% for the bottom wage-quartile) through increased migration. This impact is larger than fully removing the marginal effect of distance in migration decisions, akin to building rapid transport infrastructure. Taken together, our data suggest that – by reducing migration frictions – increasing social connections across space may have considerable economic gains. We provide suggestive evidence for economic and emotional support mechanisms underlying network effects and show that college attendance can boost the size and diversity of social networks by 20%.

Is the Demand for Clean Air Too Low? Experimental Evidence from Delhi

(with Patrick Baylis, Michael Greenstone, and Kenneth Lee)

Abstract: Do hazardous levels of air pollution in developing countries reflect low demand for air quality or imperfect information about its benefits? This paper implements an experiment to estimate the demand for clean air in a low-income country and tests for several possible market failures in information that may affect it. Combining randomized price variation for low-cost pollution masks with day-to-day variation in ambient air quality, we estimate an average marginal willingness-to-pay (MWTP) for an annual 10 unit reduction in PM2.5 of \$1.14 (USD) among low-income residents of Delhi, India. This estimate is low in global terms, but increases more than five times for respondents who are treated with a description of the health effects of air pollution prior to demand elicitation. These findings suggest limited demand for clean air may partly reflect limited information about its benefits.

An Evaluation of Historically-Trained Statistical Models in Projecting Climate Impacts

(with Haynes Stephens, Katherine Dixon, Maria Hernandez Limon, James Franke, Christoph Müller, Jonas Jägermeyr, Alex Ruane, Jonathan Proctor, and Elisabeth Moyer)

Abstract: A common approach for estimating climate change impacts is to use historical responses to year-over-year weather fluctuations as analogues of responses to future, warmer conditions. For agricultural impacts in particular, it is standard to rely on statistical models trained on observed crop yields, temperature, and precipitation. In this work we show that widely-used statistical models overestimate climate-driven yield losses by conducting “simulated data experiments” using simulations of maize in the U.S. corn belt from the Global Gridded Crop Model Intercomparison (GGCMI) Phase 2 exercise. These simulations involve independent process-based models varying widely in construction and assumptions, but statistical fits to their historical yields overstate future damages by nearly a factor of two on average. The underlying cause is the sensitivity of plants to moisture stress: because relative humidity stays roughly constant under climate change, while it is typically high in warm years in the historical period, the moisture stress associated with a given heat exposure is lower in a warmer future. We show that statistical models based on vapor pressure deficit or soil moisture instead better reproduce both present-day yield fluctuations and future climatological changes. These results highlight that goodness-of-fit tests on present-day data do not ensure that a statistical model can accurately project climate damages. The lessons learned are general to all climate impacts studies based on historical data: simulated data experiments are critical for ensuring that the variables used reflect the primary drivers of future changes.

Selected Work in Progress

Social Networks as Climate Insurance: Evidence from Facebook

(with Michael Bailey)

Estimating the Social Value-Added of Education: Evidence from Facebook

(with Michael Bailey)

The Equilibrium Effects of Public School Mergers: Evidence from India

Policy Reports

Job Loss and Behavioral Change: The Unprecedented Effects of the Delhi Lockdown

(with Kenneth Lee, Patrick Baylis, and Michael Greenstone)

CEPR Covid Economics, October 2021

Awards, Scholarships, and Grants

National Academy of Education / Spencer Dissertation Fellowship	2022 –
NSF Environmental Data Science Fellowship	2020 –
NSF Graduate Research Fellowship	2017 –
DRW Graduate Fellowship in Environmental Economics	2017 –
Berkeley/Sloan Summer Institute in Environmental Economics	2019
Soros Fellowship For New Americans, Finalist	2019
Heinrich W. Brinkmann Thesis Prize in Mathematics, Swarthmore College	2015
Philip Evans Scholar, Swarthmore College	2011–2015

Research Funding

International Growth Centre (£50,000)	2023
World Bank (\$155,000)	2022
J-PAL King Climate Action Initiative (\$150,000)	2021
J-PAL Agricultural Technology Adoption Initiative (\$85,000)	2020
Becker Friedman Institute (\$50,000)	2019
Tata Centre for Development (\$15,000)	2019

Teaching Experience

Education in Developing Contexts (MPP)	Lecturer	2022 –
Economics of Education (graduate)	TA for Prof. Dinerstein	2021
Environmental Data Science (graduate)	Lecturer	2020
Development Economics (graduate)	TA for Prof. Voena	2020
Behavioral & Development Economics (graduate)	TA for Prof. Bursztyn & Prof. Voena	2019
Political Economy of Development (graduate)	TA for Prof. Blattman & Prof. Robinson	2019

Research Experience and Other Employment

Visiting Research Scientist, Meta	2020 –
Economic Advisor, Department of Education, Government of Madhya Pradesh, India	2019 –
Pre-Doctoral Fellow, Michael Greenstone, Energy Policy Institute of Chicago	2015–2017
Summer Analyst, Credit Suisse Securities	2014
Summer Researcher, Federal Reserve Bank of New York	2013
Summer Researcher, Securities and Exchange Commission	2013

Professional Experience

Conferences	<i>AEA 2021, AEFP 2022, NAEEd/Spencer 2023, NEUDC 2023, Y-RISE 2023, NBER EEE 2024 (scheduled)</i>
Refereeing	<i>Journal of Political Economy, Journal of the European Economic Association</i>

Other Writing

In Delhi's class pyramid, air pollution is a great leveller (with Michael Greenstone and Kenneth Lee)
Hindustan Times, November 2021

Delhi's air pollution is a public health emergency, so why aren't more people wearing masks?
(with Patrick Baylis, Michael Greenstone, and Kenneth Lee)
Indian Express, November 2019

Additional Information

Citizenship	United States
Programming Skills	Python, R, Julia, Matlab
Languages	Hindi (Native), Mandarin Chinese (Proficient)