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Academic Appointments

Harvard University (2023 – Present)
Postdoctoral Fellow, Environment and Natural Resources Program, Harvard Kennedy School Belfer Center & Salata Institute for Climate and Sustainability
- Project: *Decarbonizing aviation with sustainable aviation fuel*

Carnegie Mellon University (2022 – 2023)
Postdoctoral Associate, Department of Engineering and Public Policy
Visiting Researcher, Institute of Energy, Environment, and Economy, Tsinghua University (Field research in China as part of the CMU appointment, Summer 2023)
- Project: *Sustainable supply chains for multinationals with plants in China*

Education

Massachusetts Institute of Technology
Ph.D. in Social and Engineering Systems (2017–2022)
Dissertation: *Local official and polluter accountability in China's environmental inspections*
M.Fin. in Finance (2015–2017)

Zhejiang University
B.S. in Applied Mathematics (2011–2015)

Fields
Environmental and Resource Economics
Applied Microeconomics

References

Professor James H. Stock
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Professor Valerie Karplus
CMU Department of Engineering and Public Policy
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Pittsburgh, PA 15213
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Professor Aaron Smith
UC Berkeley Department of Agricultural and Resource Economics
207 Giannini Hall
Berkeley, CA 94720
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Professor Henry Lee
Harvard Kennedy School
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Fellowships
MIT Presidential Fellowship, 2017

Teaching
Science, Technology and Public Policy, Massachusetts Institute of Technology
Teaching assistant for Professors Noelle Selin and Kenneth A. Oye, Spring 2021 and Spring 2020

Job Market Paper

Policy Options to Achieve US Sustainable Aviation Fuel Targets (with Kristen McCormack, William A. Scott, Aaron Smith, Jingran Zhang, and James H. Stock) [link] [code]
NBER Working Paper No. w34326

Lead author: I designed the equilibrium model, carried out the empirical analysis and coding, collected and processed the data, wrote the majority of the manuscript, and coordinated a multi-institutional research team. While the project was initiated by James H. Stock, this paper is the central output of my postdoctoral research funded by both the Salata Institute and the Environment and Natural Resources Program.

Abstract: Decarbonizing aviation in the short term will likely entail replacing large quantities of petroleum jet fuel with sustainable aviation fuels (SAFs), which are predominantly biofuels. In the United States, biofuels are currently used as substitutes for gasoline and diesel in road transportation and are supported by a complex set of federal and state policies, including the Renewable Fuel Standard (RFS), state low carbon fuel standards, and state and federal tax credits. Policies promoting SAF, therefore, interact with surface transport biofuel policies. In this paper, we use a new detailed partial equilibrium model of road and air transportation fuel markets to compare various policy options designed to achieve a target of 3 billion gallons of SAF by 2030. Our results suggest that the target is attainable with current technology but not with current policy. Several potential federal policies, including modifications to the existing RFS, a federal SAF tax credit, or a clean aviation standard, could meet the 3 billion gallon target with similar emissions reductions and costs but different incidence. The lowest-cost policy we study entails replacing all current biofuels policies with a modest carbon tax on fossil transportation fuels paired with a SAF tax credit.

Publications

Dynamic responses of SO_2 pollution to China's environmental inspections (with Valerie J. Karplus) [link] [code]
Proceedings of the National Academy of Sciences, 2023

Abstract: We evaluate the effect of rotating inspections carried out by China's central government in 2016 to 2017 in response to the country's air pollution crisis on the environmental performance of targeted cities and coal power plants. Using a staggered difference-in-differences (DID) design, we find that during one-month inspections concentrations of sulfur dioxide (SO_2) at coal power plants in targeted cities are on average lower by 25 to 52% compared to not-yet-inspected cities but revert by 54 to 62% on average once scrutiny ends. Following inspections, SO_2 pollution increases more quickly at state-owned plants accountable to the central government, compared to state-owned plants accountable to the local (city or below) government. Our results suggest that for most plants SO_2 concentration changes during inspections may have been due primarily to the operation of end-of-pipe SO_2 removal devices, while following inspections local state-owned plants may have reduced output.

Working Papers

Effects of citizen scrutiny on polluter behavior in China (with Valerie J. Karplus) [link]

Abstract: We investigate the determinants of citizen engagement in bottom-up environmental monitoring using a unique dataset of citizen complaints and administrative records from prefecture-level cities in China. We employ logistic regression models to estimate the effects of prior contact with local bureaucrats and characteristics of cities and plants on subsequent citizen participation. Our analysis yields three main findings. First, cities with lower baseline environmental performance experience significantly higher per capita complaint rates during inspections. Second, while overall complaint volume is higher in these cities, citizen reports do not reliably target the most polluting plants, underscoring the technical complexity of environmental monitoring. Third, using a natural experiment with two inspection rounds, we find that citizen complaint rates in the follow-up round decline when air pollution measures revert to baseline, suggesting that the persistence of official intervention is necessary to sustain citizen engagement. Our results imply that, without additional training or resources to enhance citizen reporting accuracy, bottom-up monitoring programs may have limited effectiveness in identifying non-compliance.

Why participate? Understanding the drivers of citizen complaints during China's environmental inspections (with Valerie J. Karplus and Lily L. Tsai) [link]

Abstract: We investigate the determinants of citizen engagement in bottom-up environmental monitoring using a unique dataset of citizen complaints and administrative records from prefecture-level cities in China. We employ logistic regression models to estimate the effects of prior contact with local bureaucrats and city and plant characteristics on subsequent citizen participation. There are three main findings. First, cities with lower baseline environmental performance experi-

ence significantly higher per capita complaint rates during inspections. Second, while overall complaint volume is higher in these cities, citizen reports do not reliably target the most polluting plants, underscoring the technical complexity of environmental monitoring. Third, using a natural experiment with two inspection rounds, we find that citizen complaint rates in the follow-up round decline when air pollution measures revert to baseline, suggesting that the persistence of official intervention is necessary to sustain citizen engagement. Our results imply that, without additional training or resources to enhance citizen reporting accuracy, bottom-up monitoring programs may have limited effectiveness in identifying non-compliance.

Papers in Progress

Towards credible and cost-effective options for sourcing green power for supply chains in China. Policy brief for the Tsinghua Round Table

Abstract: In this study, I investigate credible and cost-effective options for sourcing green power within supply chains in China, using a mixed-methods approach. I conduct in-depth interviews with key stakeholders, including corporate sustainability leaders and energy market experts, to identify practical barriers to green power procurement, such as costs, certification hurdles, and concerns about credibility. To contextualize these challenges, I undertake a comparative case analysis with established U.S. frameworks, focusing on California's cap-and-trade system and renewable electricity certificate markets. By integrating qualitative insights from stakeholder perspectives with institutional comparisons, I highlight structural differences, policy designs, and incentive mechanisms between China and the United States. Based on these methods, I offer evidence-based recommendations for policymakers and firms, emphasizing the importance of robust accounting standards, transparent certification, and the adaptation of international best practices to enhance the effectiveness and trustworthiness of green power sourcing in China's supply chains.

Seminars & Conferences

2025	Regional SAF Workshop for Massachusetts and New England
2024	North American SAF Conference and Expo; ASSA Annual Meeting
2023	ARCS Annual Research Conference; Roundtable on Corporate Carbon Neutrality Strategies (Tsinghua University)
2022	Northeast Workshop on Energy Policy and Environmental Economics
2021	Environmental Politics and Governance Conference; Duck Family Graduate Workshop; China Research Group Doctoral Symposium; Interdisciplinary Ph.D. Workshop in Sustainable Development
2020	ETH Academy on Sustainability and Technology; Institutional and Organizational Economics Academy; Duck Family Graduate Workshop in Environmental Politics and Governance

Academic Service

Student organizer, Sloan China Seminar Series, MIT (2017–2020)
Research Collaborator, Sustainable PPE Initiative, MIT (2020–2021)

Languages

English (fluent), Chinese (native)

Software skills

Python, Stata, R, MATLAB, LaTeX