MIT Economics

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ACADEMIC POSITIONS
London School of Economics and Political Science
Assistant Professorial Research Fellow (2026-2027)

DOCTORAL STUDIES
Massachusetts Institute of Technology (MIT)
PhD, Economics, May 2026
DISSERTATION: "Essays in Environmental and International Economics"

DISSERTATION COMMITTEE AND REFERENCES

Professor Benjamin Olken
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Professor Arnaud Costinot
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Professor Clare Balboni
London School of Economics and Political Science
32 Lincoln's Inn Fields
London WC2A 3PH, United Kingdom
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PRIOR EDUCATION
Yale University 2017
MPH, Health Policy
Yale University 2016
BA, Global Affairs, *summa cum laude*

CITIZENSHIP United States **GENDER** Male

LANGUAGES English (native), Spanish, Mandarin (advanced), Portuguese (intermediate), Indonesian, Cantonese (beginner)

FIELDS Environmental, Trade, Development

TEACHING EXPERIENCE

Environmental Economics (PhD, MIT course 14.475) 2026
Teaching Assistant to Profs. Ben Olken and Jacob Moscona
(Rating: 7.0/7.0)

Applied Economics for Managers (MBA, MIT course 15.024) 2024/26
Teaching Assistant to Profs. Tavneet Suri and Namrata Kala

BREAD-IGC Virtual PhD Lectures on Environmental Economics 2023
Teaching Assistant to Profs. Ben Olken and Seema Jayachandran

Linear Algebra & Real Analysis I (Harvard course Math 23a) 2018
Teaching Assistant to Prof. Paul Bamberg

RELEVANT POSITIONS

Research Assistant to Profs. Ben Olken and Jacob Moscona 2025-2026
Short-term Consultant, World Bank, Jakarta 2024
Research Assistant to Prof. Clare Balboni 2021-2022
Research Assistant to Profs. Rema Hanna and Ben Olken, 2017-2020
Evidence for Policy Design at Harvard Kennedy School

FELLOWSHIPS, HONORS, AND AWARDS

Dartmouth Globalization PhD Fellowship 2025
George and Obie Shultz Fund Grant, MIT 2022, 2023, 2024
Martin Family Society of Fellows for Sustainability, MIT 2023
NBER Pre-Doctoral Fellowship in Health and Aging 2022
National Science Foundation Graduate Research Fellowship 2020
Alpheus Henry Snow Prize, Yale University 2016
Saybrook College Fellows' Prize, Yale University 2016
Dupuy Graduation Prize, Yale University 2016
Phi Beta Kappa, Yale University 2015
Richard U. Light Fellowship for East Asian Language Study 2013

PROFESSIONAL ACTIVITIES

Conference Presentations: LSE Environment Camp (2026), IIFET (2026)

Referee: *American Economic Review*, *Review of Economic Studies*, *American Economic Journal: Economic Policy*, *The Economic Journal*, *Journal of Development Economics*, *Journal of Environmental Economics and Management*

Service:
MIT Presidential Advisory Cabinet (2021-2022)
MIT-Harvard PhD Application Assistance & Mentoring Program (2020-2023)

Departmental:
Scientific Committee, LSE Environment Week (2026)
Organizer, MIT Environmental Economics Lunch (2024-2025)
Organizer, MIT Development Tea (2022-2024)

PUBLICATIONS

The Economics of Tropical Deforestation
(with Clare Balboni, Robin Burgess, and Benjamin A. Olken)
Annual Review of Economics 15, pp. 723-754, September 2023.

Two factors have elevated recent academic and policy interest in tropical deforestation: first, the realization that it is a major contributor to climate change; and second, a revolution in satellite-based measurement that has revealed that it is proceeding at a rapid rate. We begin by reviewing the methodological advances that have enabled measurement of forest loss at a fine spatial resolution across the globe. We then develop a simple benchmark model of deforestation based on classic models of natural resource extraction. Extending this approach to incorporate features that characterize deforestation in developing countries—pressure for land use change, significant local and global externalities, weak property rights, and political economy constraints—provides us with a framework for reviewing the fast-growing empirical literature on the economics of deforestation in the tropics. This combination of theory and empirics provides insights not only into the economic drivers and impacts of tropical deforestation but also into policies that may affect its progression. We conclude by identifying areas where more work is needed in this important body of research.

RESEARCH PAPERS

Pay a Man to Fish: Subsidies, Trade, and Cooperation in the Global Commons *(Job Market Paper)*

Contemporary environmental issues are global in scope, but international cooperation to address them has often remained elusive, resulting in resource depletion across a range of common-pool settings. In this paper, I study whether and how trade agreements can achieve conservation objectives. I develop a model of trade policy in which countries share a renewable resource stock and trade the output. Production subsidies impose externalities on trading partners both through the world price and directly through the shared stock, which changes both unilaterally optimal policy and the incentives to cooperate. To quantify the objects in my model, I assemble a new geospatial panel of the global tuna industry, linking GPS-derived vessel tracks with harmonized administrative catch and effort records. I present evidence that additional fishing pressure lowers contemporaneous fishing productivity for all vessels in a given ground. I then estimate supply from vessels' location, participation, and trip-length choices and demand using ocean-climate shocks as price instruments, and leverage an industry-standard biological model to estimate the dynamics of stock regrowth. I embed these estimates in a dynamic game in which governments set trade and fisheries policy over shared tuna stocks. Acting unilaterally, governments deliver less than a fifth of the conservation gains of a global planner. Noncooperation costs $9.64 billion in present value, and 79% of this cost comes from stock externalities rather than terms-of-trade manipulation. Because tariffs set to manipulate the terms of trade also restrict fishing, trade liberalization alone lowers both welfare and stocks; most of the welfare gains lie in disciplining fishing on shared grounds alongside trade.

Clearing the Air on the Benefits and Costs of Road Infrastructure
(with Clare Balboni, Johannes Boehm, Lorenzo Marzano, and Mazhar Waseem)

Investments in transportation infrastructure can yield sizable trade and commuting cost gains, but may also contribute to damaging local air pollution from increased vehicle traffic. Accounting for such costs is especially important in developing country cities, which are making significant investments in expanding road networks but where high ambient pollution concentrations contribute to severe health impacts. We develop a quantitative urban equilibrium model, integrating a novel granular atmospheric model of pollution dispersion, in order to estimate the impacts of investing in urban roads accounting for both gains from economic integration and costs from local pollution exposure. We estimate the model using high-resolution data on emissions, pollution transport, commuting and goods trade in Lahore, Pakistan, one of the world's most polluted cities. Counterfactual simulations consider the aggregate and distributional implications of major road infrastructure projects in the city.

Environmental Regulation with Irreversible Investments: Evidence from High Plains Aquifer Depletion
(with Nathaniel Hickok)

Many of the world's major aquifers are being rapidly depleted from agricultural irrigation, generating dynamic common-pool externalities by raising future extraction costs. Entry restrictions are commonly used to limit depletion because well drilling is easily monitored, but they are second-best compared to Pigouvian taxes that directly target the intensive margin of water use. When policies cannot be tailored to heterogeneous users, however, the relative effectiveness and political feasibility of entry fees and water-use taxes become theoretically ambiguous, depending crucially on the correlation between water users' productivity and externalities. To study this question, we develop a dynamic model of farmers' joint well-drilling and water-use decisions, integrated with a physically realistic model of groundwater flows, and estimate it using field-level data on aquifer levels, water use, and crop production in the Kansas High Plains Aquifer from 1959 to 2022. We find that field-level productivity and water-use externalities are strongly positively correlated due to the spatial concentration of high-productivity fields, leading uniform taxes to outperform entry fees in terms of aggregate welfare. Nevertheless, entry fees are preferred by most users because the optimal uniform tax exceeds the marginal social cost of water use for all but the most productive fields. However, driven by irreversible well investments that lock in depletion from high-externality early entrants, the effectiveness and popularity of entry fees decline rapidly over time. These findings highlight how heterogeneity and irreversibility jointly shape the efficiency and political feasibility of environmental regulation.

Out with the Old, In with the New: Equity and Efficiency of Secondary Market Subsidies for Electric Vehicles
(with Nathaniel Hickok and Dam Linh Nguyen)

We evaluate the relative cost effectiveness and distributional impacts of primary- and secondary-market subsidies for electric vehicle adoption. We develop a simple theoretical framework that highlights the ambiguous cost-effectiveness of the two subsidy designs. Relative to subsidies for purchases of used electric vehicles, subsidies for new purchases always induce greater adoption. However, they also lead to more inframarginal government spending due to consumer selection into resale. We study this trade-off empirically by proposing a dynamic model of the vehicle market, which captures sorting of consumers into resale through endogenous vehicle replacement decisions. To analyze the equilibrium consequences of the two subsidy designs, we calibrate the model using granular data on car registrations and transactions in Texas from 2015 to 2022. Counterfactual results indicate that, in our setting, secondary-market subsidies (1) are more cost-effective than primary-market subsidies due to large decreases in inframarginal spending; and (2) achieve more progressive distributional impacts.

Global Public Goods and Local Public Services: Evidence from Polio Eradication in Pakistan

What are the consequences of limited state capacity in developing countries for the pursuit of global public goods provision? I study this question in the context of polio eradication in Pakistan, where the disease remains endemic and where policy commitment to eradication has escalated over the past decade. Exploiting the incidence of genetic mutations in the oral polio vaccine virus that cause localized outbreaks, I test whether a short-term increase in the intensity of polio eradication activity crowds out the receipt of routine childhood immunizations delivered primarily in local health clinics. I find empirical support for a crowd-out effect: children born in a quarter-year of intensified polio immunization activity are 8.9% less likely to have received the BCG (tuberculosis) vaccine and 19.5% less likely to have received the first dose of the diphtheria, pertussis, and tetanus (DPT) vaccine. I find evidence that these effects are driven mainly by the supply of, rather than demand for, vaccines and health services. My results have implications for the design of health and vaccination campaigns and for assessment of the local costs of public goods provision in developing countries.

Subsidy Design and the Spatial Incidence of Fisheries Policy
(with Andrés de Loera)

Countries facing over-exploitation of domestic waters may find it politically and economically advantageous to offer subsidies as a way of "decongesting" their domestic fisheries. Fuel subsidies, the most significant form of fisheries subsidies, may play such a role if they induce distant water fishing. We

characterize the conditions under which fuel subsidies are decongesting, and then estimate their empirical effects using a triple-difference design exploiting a change in Chinese subsidy policy. We show that China's fuel subsidy increased fishing in its domestic waters, by suppressing a 1.24% elasticity of domestic fishing with respect to the oil price. Meanwhile, it decreased distant water fishing. Consistent with our model, we find that the total number of fishing trips increased but their distance from port of departure decreased. We also show that non-Chinese vessels in spatial competition with China decreased their fishing in response to China's subsidies. However, we show that the evolution of China's subsidy policy away from fuel subsidies and towards spatially specific subsidies did promote domestic decongestion: had China not changed its subsidy policy, vessels in our sample would have fished 39% more in the Chinese EEZ and 33% less outside of it. The change reduced total fishing on net, implying a trade-off between the environmental and global distributional consequences of disciplining fisheries subsidies.

RESEARCH IN PROGRESS

Firm-Level Adaptation to Carbon Border Taxes: Evidence from a Randomized Evaluation
(with David Atkin and Banu Demir)

Reducing firm-level emissions while minimizing impacts on economic growth has become a central dilemma facing policymakers in low- and middle-income countries, especially as countries around the world have begun using trade policy to tax the carbon content of imports. In this project, we experimentally evaluate three interventions—consisting of technical training and subsidized loans for investments—aimed at mitigating the economic costs of the European Union's Carbon Border Adjustment Mechanism (CBAM) on small and medium enterprises in Türkiye. The first intervention focuses on direct carbon mitigation measures; the second focuses on product innovation to move firms toward greener product mixes; and the third focuses on improving firm-level productive efficiency. In the first wave of the experiment, we have randomized over 500 Turkish manufacturing firms using a clustering algorithm to maximize power to detect domestic spillovers (i.e., leakage) of the intervention to untreated firms. Combining newly collected survey data on firm-level investments, production practices, and carbon emissions with administrative data on the universe of Turkish firm-to-firm linkages and sales, we will assess the tradeoffs between environmental and firm growth outcomes and explore whether policies can simultaneously achieve both goals.

Spatially Governing the Commons
(with Karl M. Aspelund)

Spatial regulation is an increasingly widespread policy instrument for achieving conservation objectives worldwide. A typical concern with spatially oriented regulation is leakage, the displacement of activity to unregulated areas. We study the economic consequences of leakage when natural resources are subject

to ecological and economic shocks that affect different areas, producers, and time periods unevenly. We develop a framework, nesting canonical results from the prices versus quantities literature, showing that leakage can act as a hedge for ecological uncertainty. We collect detailed harvest, price, and ecological data from the U.S. Atlantic scallop fishery, one of the nation's highest-value fisheries, and illustrate how alternative policy regimes can meaningfully impact welfare under such uncertainty. We pay particular attention to how warming oceans have changed our empirical findings. Ecological shocks have become more correlated across space, so displaced activity now lands on grounds just as stressed as the ones it left, and leakage no longer hedges. Much of the regulation's failure to keep pace can be explained by a regulator still using growth expectations from a decade ago, before the precautionary value of conservation grew.

Internalizing Environmental Externalities: A Coasean Approach to Urban Solid Waste Management in Kampala, Uganda
(with Mychaela Paetow) Funding: IGC SPF Grant

Cities in developing countries are generating increasing volumes of solid waste, straining existing waste management systems. Open dumping and burning are commons means of disposal, generating meaningful environmental and health externalities, especially in low-income communities and informal settlements. We partner with the Kampala Capital City Authority to test a new intervention designed to deter dumping: installing nets to catch household solid waste that would otherwise flow through rainwater drainage channels, causing flooding downstream. We are piloting a mechanism to elicit downhill households' willingness-to-pay, and uphill households' willingness-to-accept, to install nets along shared drainage channels, facilitating Coasean bargaining to realign private and social costs from improper waste management practices.

The Economics of Informal Recycling Markets: Evidence from Indonesia's Waste Banks
(with Mychaela Paetow) Funding: J-PAL K-CAI