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EDUCATION

Ph.D. in Economics, University of Colorado Boulder	2023 (Expected)
Dissertation Committee: Jonathan E. Hughes (Chair), Tania Barham, Daniel Kaffine, Shuang Zhang	
M.A. in Economics, University of Colorado Boulder	2019
B.A. in Economics, Nankai University, China	2015
Outstanding Bachelor Thesis	

RESEARCH INTERESTS

Applied Microeconomics, Environmental Economics, Agricultural and Resource Economics, Transportation, Urban Economics

PUBLICATION

"Understanding the Heterogeneity in the Effect of Driving Restriction Policies on Air Quality: Evidence from Chinese Cities." *Environmental and Resource Economics* 82.1 (2022): 133-175.

WORKING PAPERS

"Beggars-Neighbors or Free-riding? Transboundary Behaviors in Decentralized Water Pollution Policies" (Job Market Paper)

"Estimating the Marginal External Cost of Traffic Congestion," with Jonathan E. Hughes

RESEARCH IN PROGRESS

"The Transboundary Effect of Nonpoint Source Pollution Policies on Agricultural Runoff"

"Machine Learning on the Efficiency of Driving Restriction Policies"

CONFERENCE PRESENTATIONS

"Beggars-Neighbors or Free-riding? Transboundary Behaviors in Decentralized Water Pollution Policies"

23rd Annual CU Environmental and Resource Economics Workshop 2022

11th Annual Front Range Energy and Environmental Economics Camp 2022

48th AERE Eastern Economics Association (EEA) Annual Conference 2022

"Understanding the Heterogeneity in the Effect of Driving Restriction Policies on Air Quality: Evidence from Chinese Cities."

15th North American Meeting of the Urban Economics Association 2021

22nd Annual CU Environmental and Resource Economics Workshop 2021

PhD Student Workshop of the Urban Economics Association 2021

47th AERE Eastern Economics Association (EEA) Annual Conference	2021
67th Annual North American Meetings of the Regional Science Association International	2020
“The Effects of Political Events on Stock Market with a New Fama-French 3-factor Model”	
14th Eurasia Business and Economics Society (EBES) Conference	2014

TEACHING EXPERIENCE

Certificate in College Teaching	2023 (Expected)
Instructor:	
Environmental Economics	Spring 2020
Math Tools for Economists I	Fall 2019
Teaching Assistant:	
Principles of Microeconomics	Fall 2017, Fall 2018, Spring 2019, Fall 2020, Spring 2022, Fall 2022
Principles of Macroeconomics	Spring 2018, Spring & Fall 2021

PROFESSIONAL ACTIVITIES

Referee Service:

Resource and Energy Economics, Regional Science and Urban Economics, Transportation

Memberships:

American Economic Association, European Economic Association, Association of Environmental and Resource Economists, Eastern Economic Association, Urban Economics Association, Regional Science Association International, Eurasia Business and Economics Society

AWARDS

Graduate Award for Public Policy Research, CU Boulder	2020, 2021, 2022
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LANGUAGES

Mandarin Chinese (native), English (proficient), Spanish (beginning)

REFERENCES

Jonathan E. Hughes (Chair)	Tania Barham
Associate Professor of Economics	Associate Professor of Economics
University of Colorado Boulder	University of Colorado Boulder
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Daniel Kaffine	Shuang Zhang
Professor of Economics	Associate Professor of Economics
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ABSTRACTS

“Beggar-thy-Neighbor or Free-riding? Transboundary Behaviors in Decentralized Water Pollution Policies” (Job Market Paper)

Public policies with different degrees of centralization face optimization problems at different administrative levels, which motivates beggar-thy-neighbor and free-riding behaviors that lead to insufficient regulations at jurisdictional boundaries. This paper investigates whether states exhibit these behaviors when implementing nonpoint-source (NPS) water pollution policies. I compile a unique and comprehensive dataset of three NPS policies and hydrological information using ArcGIS. Depending on the policies' characteristics, I use a Probit model, a duration model with selection, and a Heckman selection model, respectively. I find that rivers within 30 km of state borders are less likely to be treated by the two more decentralized policies, i.e. Water Quality Assessment Program, especially the Total Maximum Daily Load (TMDL) Program, but receive larger amounts of grants under the relatively centralized NPS Pollution Management Program. States exhibit beggar-thy-neighbor behavior within 5 km upstream of state borders, with a 10.28% to 18.9% lower probability of TMDL development than intrastate rivers, and exhibit free-riding behavior within 10 km downstream of state borders, with a 25.71% to 55.81% lower probability of TMDL development. The free-riding behavior is affected by the upstream state's environmental and political-economic characteristics. Each behavior leads to a large deadweight loss.

“Understanding the Heterogeneity in the Effect of Driving Restriction Policies on Air Quality: Evidence from Chinese Cities.” *Environmental and Resource Economics* 82.1 (2022): 133-175.

Many cities around the world have adopted driving restriction policies to reduce vehicle emissions. However, evidence on the effectiveness of these policies is mixed. I exploit detailed and comprehensive data on Chinese cities to conduct a large-scale study of the effectiveness of a variety of driving restriction policies in a variety of locations. I estimate the monitor-specific short-run treatment effects of each driving restriction policy using a regression discontinuity in time approach, and the average treatment effect using a panel fixed-effect approach. The regression discontinuity in time estimation results show strong heterogeneity. Among the eight measures of air quality used, CO , NO_2 , $PM_{2.5}$, PM_{10} , and AQI respond most to driving restriction policies. The average reduction of CO and NO_2 are consistent with back-of-the-envelope calculations for policies that effectively limit vehicle use. Using detailed information on the design of each policy, I show that policy details and pollution concentration are the major factors that affect the actual and estimated effects of driving restriction policies, and also a potential explanation for earlier studies that showed driving restriction policies had little effect.

“Estimating the Marginal External Cost of Traffic Congestion,” with Jonathan E. Hughes

External costs of traffic congestion in the US exceed \$120 billion each year. Thus, the optimal regulation of traffic requires estimation of marginal external costs. We develop a robust methodology to estimate time-varying and location-specific congestion costs. The approach exploits readily available data and can be easily adapted to different roadway types and geographic scales. We illustrate the approach using detailed data for thousands of locations on California highways. We find that the mean congestion costs are on the order of \$.10 per vehicle per mile but exceed \$1 per vehicle per mile in congested cities during peak travel times. The highly variable nature of traffic conditions indicates that the second-best congestion charges do a poor job of correcting external costs. We show tolls based on average values only capture 15 to 69 percent of the welfare gain of an efficient Pigouvian policy. The methodology proposed here could be used by transportation planners to estimate tolls in real-time thus improving the policy efficiency.