

PAN CHEN

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Department of Economics
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Education	University of Colorado-Boulder Ph.D. Economics, 2021 to 2026 (expected)
	University of Colorado-Boulder M.A. Economics, 2021 to 2023
	Huazhong University of Science & Technology, Wuhan, China M.A. Economics, 2015 to 2018
	Huazhong Agricultural University, Wuhan, China B.A. Economics (with distinction), 2011 to 2015
Fields	Primary: Environment, Development Secondary: Economic History, Technical Change, Political Economy
Job Market Paper	Powering the Future: The Long-Term Human Capital Effects of Rural Electrification <i>Abstract:</i> This paper examines how rural electrification during middle childhood affected long-term human capital in 1990s China. Unlike most studies that focus on grid connection, my paper emphasizes electricity affordability. I develop a simple model of human capital investment in which electrification is an adult-labor-biased technical change in agriculture. Because children in middle childhood are poor substitutes for adult laborers in farm work, the productivity shock has little impact on their opportunity cost of schooling. The model therefore predicts a strong income effect and a negligible substitution effect, leading to higher schooling for children. I test this empirically using a cohort difference-in-differences design, leveraging variation in electricity price reductions across counties. I find that lower electricity prices in middle childhood significantly increase educational attainment and later adult cognitive scores. Increased agricultural productivity is identified as one mechanism, consistent with the model. This paper also highlights why older children are not significantly affected. China's late-1990s experience offers insights for rural electrification efforts in many developing countries today.
Publication	Industrialization and Pollution: The Long-Term Impact of Early-Life Exposure on Human Capital Formation, January 2025, <i>Journal of Public Economics</i> <i>Abstract:</i> Air quality in developing countries is often much worse than in developed economies, yet evidence on the long-term human capital effects of air pollution in these settings is limited. This paper uses a cohort difference-in-differences approach to examine the impact of early-life exposure to air pollution during China's 1950s industrialization on human capital formation. It assumes that economic opportunities linked to industrial plants impact upwind and downwind counties similarly within a 30-mile radius. The results indicate that moving from the 25th to 75th percentile of exposure reduces children's education by approximately 0.11 years. This effect size is notably larger than the impacts of three other factors affecting educational attainment in both China and the United States.

Working Paper

Deciding to Participate: The Impact of Air Pollution on Civic Engagement in China

Abstract: Online engagement with government is increasingly common in the digital age, yet the factors driving such civic activity remain poorly understood. This paper uses an instrumental variable (IV) strategy to examine whether air pollution influences online engagement with the government, measured by message volume on an official platform in China. I find that a 10 ug/m³ increase in weekly average PM_{2.5} results in a 15.9% surge in messages. During periods of higher pollution, people are more likely to voice complaints, seek assistance, make inquiries, and offer suggestions. Three mechanisms help explain this response: (1) pollution shifts the perceived benefits of civic engagement, (2) it intensifies discontent linked to economic disparities, and (3) it heightens awareness of daily life problems. Sentiment analysis using large language models (LLMs) and dictionary-based tools shows that air pollution tends to worsen emotional well-being, consistent with existing literature, although the effect is statistically insignificant in most cases. Understanding these dynamics is crucial, as timely responses to public concerns can help prevent more serious outcomes.

Selected Papers in Progress

Text to Data: A Machine Learning Approach to Historical Chinese Documents (with Wolfgang Keller, Carol Shiue, and Sen Yan)

Environmental Regulation and Within-Firm Adjustments in Multi-Process Manufacturing (with Feitao Jiang and Yingjun Su)

Honors & Awards

Graduate School Travel Grant, University of Colorado-Boulder, 2025

Graduate School Summer Fellowship, University of Colorado-Boulder, 2025

Third Year Paper Prize, University of Colorado-Boulder, 2024

Graduate Award for Public Policy Research, University of Colorado-Boulder, 2023

Teaching

Instructor of Record

Intermediate Macroeconomic Theory, University of Colorado-Boulder, spring 2024

Teaching Assistant

Natural Resource Economics, University of Colorado-Boulder, fall 2025

Environmental Economics University of Colorado-Boulder, fall 2025

Principles of Microeconomics, University of Colorado-Boulder, fall 2021 to fall 2023, fall 2024

Principles of Macroeconomics, University of Colorado-Boulder, spring 2025

Employment

WISDRI Engineering & Research Incorporation Limited, China, economic analyst – iron and steel industry, 2018 to 2021

Research

Research Assistant, reporting to Professor Carol Shiue, University of Colorado-Boulder, summer 2022 & 2024

Presentations

ASSA/AEA Annual Meeting, Philadelphia, 2026 (scheduled)

Colorado State University, 2025

20th Economics Graduate Student Conference, Washington University in Saint Louis, 2025

Southeastern Workshop on Energy & Environmental Economics & Policy (SWEEEP), Georgia Institute of Technology, 2025

	Association of Environmental and Resource Economists (AERE) Summer Conference, Santa Ana Pueblo, 2025				
	14th Annual Front Range Energy and Environmental Economics Camp, Boulder, 2025				
	25th Annual CU Environmental and Resource Economics Workshop, Vail, 2024				
	24th Annual CU Environmental and Resource Economics Workshop, Vail, 2023				
	Chinese Economists Society (CES) Annual China Conference, Hefei, China, 2018				
	National Graduate Students in Economics Annual Conference, Wuhan, China, 2018				
Referee Service	<i>Canadian Journal of Economics, Journal of Development Economics, Journal of Environmental Economics and Management</i>				
Skills & Languages	Software: Stata, MATLAB, Python, ArcGIS, Google Earth Engine Languages: English (fluent), Chinese (native)				
Citizenship	Chinese				
References	<table border="0"> <tr> <td style="vertical-align: top;"> Advisor Professor Jonathan Hughes Department of Economics University of Colorado-Boulder 256 UCB Boulder, CO 80309 Email: jonathan.e.hughes@colorado.edu </td> <td style="vertical-align: top;"> Committee member Professor Daniel Kaffine Department of Economics University of Colorado-Boulder 256 UCB Boulder, CO 80309 Email: daniel.kaffine@colorado.edu </td> </tr> <tr> <td style="vertical-align: top;"> Committee member Professor Taylor Jaworski Department of Economics University of Colorado-Boulder 256 UCB Boulder, CO 80309 Email: taylor.jaworski@colorado.edu </td> <td style="vertical-align: top;"> Committee member Professor Tania Barham Department of Economics University of Colorado-Boulder 256 UCB Boulder, CO 80309 Email: tania.barham@colorado.edu </td> </tr> </table>	Advisor Professor Jonathan Hughes Department of Economics University of Colorado-Boulder 256 UCB Boulder, CO 80309 Email: jonathan.e.hughes@colorado.edu	Committee member Professor Daniel Kaffine Department of Economics University of Colorado-Boulder 256 UCB Boulder, CO 80309 Email: daniel.kaffine@colorado.edu	Committee member Professor Taylor Jaworski Department of Economics University of Colorado-Boulder 256 UCB Boulder, CO 80309 Email: taylor.jaworski@colorado.edu	Committee member Professor Tania Barham Department of Economics University of Colorado-Boulder 256 UCB Boulder, CO 80309 Email: tania.barham@colorado.edu
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