PAN CHEN

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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, China
M.A. Economics, 2015 to 2018

Huazhong Agricultural University, 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

Abstract: This paper examines how exposure to 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 model of human capital investment in which electrification acts as an adult-labor-biased technical change in agriculture. The model 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. Further analysis identifies increased agricultural productivity as one mechanism, consistent with the model. Greater public investment in education may be another mechanism, as cheaper, more reliable electricity likely supports school infrastructure. This paper also highlights why middle childhood is critical. 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, *Journal of Public Economics*

Abstract: 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 Papers

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/m^3 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.

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, CU Boulder, 2025

Graduate School Summer Fellowship, CU Boulder, 2025

Third Year Paper Prize, CU Boulder, 2024

Graduate Award for Public Policy Research, CU Boulder, 2023

Teaching

Instructor of Record
Intermediate Macroeconomic Theory, CU Boulder, spring 2024

Teaching Assistant
Natural Resource Economics, CU Boulder, fall 2025
Environmental Economics, CU Boulder, fall 2025
Principles of Microeconomics, CU Boulder, fall 2021 to fall 2023, fall 2024
Principles of Macroeconomics, CU 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, CU Boulder, summer 2022 & 2024

Presentations

ASSA Annual Meeting, Philadelphia, 2026 (scheduled)

Colorado State University, 2025 (scheduled)

20th Economics Graduate Student Conference, St. Louis, 2025 (scheduled)

Southeastern Workshop on Energy & Environmental Economics & Policy (SWEEEP) at Georgia Tech, 2025 (scheduled)

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 *Journal of Environmental Economics and Management, Canadian Journal of Economics*

Skills & Languages Software: Stata, MATLAB, Python, ArcGIS, Google Earth Engine

Languages: English (fluent), Chinese (native)

Citizenship Chinese

References

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