

# Deyu Rao

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## Education

Ph.D., Applied Economics and Management, Cornell University	ITHACA, NY, 2022 ( <i>expected</i> )
M.Sc., Applied Economics and Management, Cornell University	ITHACA, NY, 2017
B.Econ. with Distinction, Energy Economics, Renmin University of China	BEIJING, CHINA, 2015
B.A., English Language and Literature, Renmin University of China	BEIJING, CHINA, 2015

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## Research and Teaching Interests

Environmental Economics, Quantitative Urban Economics, Applied Microeconomics

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## Research

### *Job Market Paper:*

#### “Environmental Amenities and Economic Agglomeration”

Information on environmental amenities, such as air pollution, play an essential role in consumers’ formulation of decisions on residential locations, and subsequently affect the agglomeration of urban economic activities through local labor markets, service markets and housing markets. This paper provides the first empirical analysis on the value of pollution information under the quantitative spatial framework. Leveraging the spatial granularity of a rich dataset on commuting flows, consumption choices, air pollution, and housing transactions, I develop and estimate a general equilibrium model, enveloping consumers’ decisions with agglomeration and dispersion forces in the larger economy. The estimates imply that consumers’ awareness of environmental amenities can significantly alter the spatial distributions of urban population, employment, and floor space. Simulations suggest decreased residential and job density, lower housing prices and higher income in the polluted sections of the city. The estimates reveal that consumers’ willingness-to-accept being 0.4% of income to compensate for a one-standard-deviation increase in air pollution. Comparing the optimal distributions derived from the model and the observed market outcomes, I document an 8.4% gap in welfare, suggesting large welfare gain in implementing pollution information disclosure programs.

### *Working Papers:*

“The Morbidity Cost of Air Pollution: Evidence from Consumer Spending in China,” with Panle Jia Barwick, Shanjun Li, and Nahim Zahur, NBER Working Paper 24688, 2018. *under review*.

Using the universe of credit- and debit-card transactions in China during 2013-2015, this paper provides the first nationwide analysis of the healthcare cost of PM<sub>2.5</sub>. We leverage spatial spillovers of PM<sub>2.5</sub> from long-range transport for exogenous variation in local pollution and employ a flexible distributed lag model to capture semi-parametrically the dynamic response of pollution exposure. Our analysis shows a 10  $\mu\text{g}/\text{m}^3$  decrease in PM<sub>2.5</sub> would reduce annual healthcare spending by more than \$9.2 billion, about 1.5% of China’s annual healthcare expenditure.

“Improved Transportation Networks Facilitate Adaptation to Pollution and Temperature Extremes,” with Panle Jia Barwick, Dave Donaldson, Shanjun Li, and Yatang Lin. *under review*.

Based on high-resolution transaction records from the world’s largest payment network, this research shows how China’s rapid expansion of high-speed railways and air-travel networks (HSR/air) has facilitated the use of intercity travel as an effective means of adaptation. On average, HSR/air connection would reduce travelers’ exposure to both extreme pollution and temperature by 16% when home cities are experiencing pollution and temperature extremes.

### *Work-in-Progress:*

“Quantifying the Impact of COVID-19 on Production Through Air Pollution,” with Zhengyuan Wu, and Shanjun Li.

“Traffic Congestion and Consumer Spending,” with Nahim bin Zahur.

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## Teaching Experience

Teaching Assistant

for [Econometrics](#), AEM 7100 (doctorate level), Prof. Shanjun Li *Spring 2020, 2021*

for [Investments](#), AEM 4670 (undergraduate), Prof. Sumudu Watugala *Fall 2019, 2020*

for [Market Simulation](#), CICER Summer Camp *Summer 2019, 2020*

for Marketing, Prof. Jura Liaukonyte *Summer 2020*

for Behavioral Economics, Prof. Sarah Jacobson *Summer 2020*

Outstanding Graduate Teaching Assistant, Dyson School of Applied Economics and Management *2020-2021*

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## Research Experience

Research Assistant

for Prof. Shanjun Li *ITHACA, 2016, 2018, 2021*

at [Cornell Institute for China Economic Research \(CICER\)](#) *ITHACA, SHANGHAI & BEIJING, 2016*

at [Cornell Institute for Social and Economic Research \(CISER\)](#) *ITHACA, 2016*

for Prof. Ping Qin *BEIJING, 2014, 2015*

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## Fellowships, Grants, and Honors

Summer Graduate Research Assistantship, Cornell University *2018-2021*

Graduate Fellowship, Cornell University *2017-2018*

Scholarship for Master's Study, China Scholarship Council *2015-2017*

Scholarship for Academic Excellence (Undergraduate), Renmin University of China *2012-2014*

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## Referee Services

Journal of Environmental Economics and Management, Journal of Economic Behavior and Organization, China Economic Review, Bulletin of Economic Research

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## Selected Press Coverage

“[How Smog Affects Spending in China](#),” The Economist, June 2018.

“The Impact of Air Pollution on Healthcare Spending in China,” etc., with Panle Jia Barwick, Shanjun Li, and Nahim Zahur, in [VoxDev](#) (Apr 2019), [VoxEU](#) (Sept 2018), [VoxChina](#) (Aug 2017).

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## Other Experience

Seminar Committee, Graduate Student Assembly (GSA) of AEM, Cornell University *ITHACA, 2018, 2019*

Level II Referee, Chinese Football Association *BEIJING, 2012-2015*

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## Software Skills

Programming: STATA, MATLAB, ArcGIS, Python, R, SAS, SPSS, ORACLE, MS SQL

Language: Mandarin Chinese (native), English (fluent)

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## References

### Shanjun Li

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