Ken Q. Bao

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Personal Website
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Education

University of California - Santa Barbara September 2017 – June 2023
PhD, Economics *Santa Barbara, California*

University of Missouri - Saint Louis August 2014 – May 2017
MA, Economics *Saint Louis, Missouri*

University of Missouri - Saint Louis August 2012 – May 2014
BA, Business Administration - Finance *Saint Louis, Missouri*

Job Market Paper

Command-Control versus Market Incentive Policies for Non-point Source Pollution

This paper aims to compare the cost-effectiveness between command-control and market instruments in addressing non-point source pollution. Non-point source pollution (NPSP) is notoriously difficult to regulate as it is extremely difficult to observe and estimate individual level discharge. There is a dearth of observational studies on the cost effectiveness of NPSP policies because the answer requires the study of how individual polluters respond to pecuniary incentives to abate. I exploit a policy setting where agricultural runoff is in fact, a point source pollution but is regulated as if it were NPSP which allows the study of abatement behavior in what is typically a NPSP setting. In this context, command-control comes in the form of mandatory best management practices (BMPs) which are a set of verifiable pollution reducing projects/procedures that do not offer firms flexibility in abatement choices. Market incentives can offer a much higher degree of flexibility and thus lower compliance costs and in this context, they come in the form of ambient mechanisms (AMMs). AMMs impose uniform tax (or subsidy) to all firms based on aggregate emissions and such approaches are theoretically appealing but have rarely been applied in practice and thus relatively little is known about them. I study a program called the Florida Everglades Forever Act intended to reduce phosphorus runoffs from entering the sensitive Everglades. The program consists of both a command-control component as well as a market incentive component. I develop a new dataset with farm level discharge and subsidies for pollution reduction and use the 2-step difference GMM estimator to estimate a marginal abatement cost (MAC) curve for the average farm. Using the estimated MAC curve, I simulate the costs under AMM and compare that with both data-estimated and engineer-estimated costs under BMPs. I find that to achieve the same benchmark pollution outcome, AMM is estimated to reduce compliance cost by 15% compared to BMPs.

Research Experience

Graduate Research Assistant May 2015 – May 2017
Center for Transportation Studies at University of Missouri - Saint Louis *Saint Louis, Missouri*
- Conducted cost-benefit analyses on various transportation policy proposals
- Conducted literature reviews
- Gathered and cleaned datasets for analyses

- Aided in writing papers for publication

Graduate Research Assistant   June 2019 - September 2019
University of California - Santa Barbara   *Santa Barbara, California*
- Conduct literature review on endogenous technological change
- Helped develop model to analyze impact of backstop technologies on conservation goals

Teaching Experience

Teaching Assistant   September 2017 – Present
University of California - Santa Barbara   *Santa Barbara, California*
- Principles of Microeconomics, UCSB ECON 1 (4 quarters)
- Intermediate of Macroeconomics, UCSB ECON 101 (2 quarters)
- Intermediate Microeconomics I, UCSB ECON 10A (1 quarter)
- Intermediate Microeconomics II, UCSB ECON 10A (5 quarter)
- Intro to Econometrics, UCSB ECON 140A (1 quarter)
- Statistics for Economics, UCSB PSTAT 109 (2 quarters)
- Corporate Financial Management, UCSB ECON 134A (6 quarters)

Teaching Associate   April 2019 – Fall 2020
University of California - Santa Barbara   *Santa Barbara, California*
- Corporate Financial Management, UCSB ECON 134A (2 quarters)
- Designed/conducted course lectures
- Wrote exams
- Mentored students

Peer Reviewed Publications

Jill M. Bernard Bracy, Ken Q. Bao, and Ray A. Mundy. "Highway infrastructure and safety implications of AV technology in the motor carrier industry". In: *Research in Transportation Economics* 77 (2019), p. 100758

Working Papers

K. Bao – "Command-Control versus Market Incentive Policies for Non-point Source Pollution"".

K. Bao – "Non-point Source Pollution and Ambient Taxes: Free Riding Incentives and Sequential Play".

C. Costello & K. Bao – "Cost Effectiveness of Coupling Payments for Ecosystem Services with Risk-based Compensation Payments".

Research Presentations

R. Mundy, K. Bao, & A. Woods – "Cost Effectiveness Analysis: Substituting Ground Transportation for Subsidized Essential Air Services", *Transportation Research Board 96th Annual Meeting*. January 2017.

K. Bao - "Command-Control versus Market Incentive Policies for Non-point Source Pollution", *2022 Association for Public Policy Analysis and Management*. November 2022.

Awards, Honors & Scholarships

Outstanding Undergraduate TA Award, 2021
University of California - Santa Barbara   *2021*

Mortimer Andron Fellowship
University of California - Santa Barbara   *2017 - 2019*

Outstanding Student Award
U.S. Department of Transportation   *2017*

Elizabeth M. Clayton Scholarship
University of Missouri - Saint Louis   *2016*

Specialized Skills

Programming Languages: Python (intermediate), R (proficient), STATA (intermediate), Julia (beginner)
Software: Excel (proficient)

Personal

Citizenship: United States
Home town: Saint Louis, Missouri