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Research Interests

Primary: Environmental and Resource Economics

Secondary: Experimental Economics, Economic History, Chinese Economy

Education

Ph.D. Candidate, Division of the Humanities and Social Sciences, California Institute of Technology (expected 2019)

M.S. in Economics, Chinese University of Hong Kong, 2014.

B.A. in Finance, Guanghua School of Management, Peking University, 2012.

Awards

The Resnick Institute Graduate Fellowship, California Institute of Technology, 2016-2018

Institute Fellowship, California Institute of Technology, 2014 - 2015

Research

Environmental and Resource Economics

The Market and Common-Pool Resource Problem – A Study of Surface Water Trading and Groundwater Depletion in California (Job Market Paper)

Summary: I develop a theory of how a market in surface water affects the performance of a groundwater basin that is in open access. I argue that a surface water market only solves the groundwater over-extraction problem when pumping costs are high, while market failure arises when the common pool resource (CPR) problem is severe. My theoretical model is designed to analyze the agricultural water use in California Central Valley, while its implications can extend to any situation where a market is put in place for a private resource that is a substitute to a CPR. My model establishes the link between the efficacy of surface water market and the farmers' crop choices in response to water supply changes. I use a micro level crop choice data to test the theory and find that the farmers rarely react to short-term water supply variations. In particular, crop acreage does not fall during droughts. This implies that pumping costs are low and sellers replace whatever amount they sell with groundwater. Therefore, surface water trade is inefficient when taking into account the depletion of groundwater resource and should be curtailed until the CPR problem is addressed.

Solving the Common-Pool Resource Problem: the Adjudication of Groundwater Rights in Southern California

Summary: In this paper I examine the effectiveness of adjudication, a legal settlement that apportions groundwater rights among the pumpers and caps total extraction from a basin. I develop a theory of how pumpers decide the amount of extraction under different groundwater management regimes with the existence of surface water supply uncertainty. My model shows that the adjudication of groundwater rights, although successfully restricting the amount of extraction, suffers from dynamic inefficiency. Through analyzing well depth changes in 33 Southern California basins, I find that adjudication leads to a stabilized water table while the users in adjudicated basins have a less counter-cyclical extraction pattern in response to surface water availability than those in unregulated basins. This suggests that a mechanism that deals with dynamic efficiency (for instance a market) should be implemented together with adjudication.

Experimental Economics

Tick Size, Price Grids and Market Performance: Stable Matches as a Model of Market Dynamics and Equilibrium (with Charles Plott, Richard Roll and Han Seo), R&R, *Games and Economic Behavior*

Summary: The tick size in a financial market is the minimum allowable difference between ask and bid prices. By the rules of each exchange, no transactions can occur within the tick interval. The impact of tick size is an ongoing controversy which we study by experimental methods, whose simplicity helps distinguish among competing models of complex real-world securities markets. We observe patterns predicted by a matching (cooperative game) model. Because a price grid interferes with the equilibrium of the competitive model and the restrictions on order flow interferes with information aggregation, the matching model provides predictions when the competitive model cannot, although their predictions are the same when a competitive equilibrium does exist. Our experiments examine stable allocations, average prices, timing of order flow, information flow and price dynamics. Larger tick size invites more speculation, which in turn increases liquidity. However, increased speculation leads to inefficient trades that otherwise would not have occurred.

Chinese Economy

An Economic Explanation of Partial Privatization

Summary: Partial privatization of state-owned enterprises has been widely seen in transition economies as a symbol of political or financial constraint. This paper presents an economic explanation driven by underdevelopment of financial institutions. Government has to finance the wealth-constrained buyers itself and internalizes the risk of default. Partial privatization could be the optimal contract balancing the trade-offs between motivational effect of cash flow rights and distortionary effect of the debt. A set of non-monotonic relationships between wealth, firm productivity and proportion of privatization has been generated. Under-pricing may come from optimal evaluation strategy and full privatization can lead to sub-optimal outcome.

Teaching Experience

Teaching Assistant for Professor Rongzhu Ke: Basic Microeconomics. Fall 2012 - Spring 2014

Teaching Assistant for Professor Colin Camerer: Behavior Economics. Fall 2015

Teaching Assistant for Professor John Ledyard: Environmental Economics. Fall 2018

References

Jean-Laurent Rosenthal (Committee Chair)
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