Zi Yang Kang

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EMPLOYMENT   **Postdoctoral Fellow**, Harvard University   2023–present

EDUCATION   **Ph.D. in Economic Analysis and Policy**, Stanford Graduate School of Business   2018–2023
M.S. in Mathematics, Stanford University   2017–2018
B.S. with Honors in Mathematics, Stanford University   2014–2017

WORKING PAPERS

"Optimal Indirect Regulation of Externalities"

Accepted for presentation at EC'23

This paper studies the regulation of a good that generates different amounts of an externality on consumption, but direct taxation of the externality is infeasible. Under certain conditions, I show that the deadweight loss due to any (possibly nonlinear) tax on the good is equal to the Bregman divergence between the allocation that the tax induces and the first-best allocation. This yields a regression-based method to derive the tax that minimizes deadweight loss in any family of taxes. I use this method to characterize the second-best nonlinear tax and show that quantity restrictions, such as bans and mandates, can be optimal. I quantify the welfare gains of using a nonlinear tax over a linear tax. Finally, I illustrate policy implications by applying my results to the taxation of vehicle miles traveled to regulate automobile externalities.

"The Public Option and Optimal Redistribution"

Accepted for presentation at EC'21

This paper examines how the equilibrium effects of a public option on the private market impact its optimal design. I develop a model in which a policymaker can choose the quality and allocation of the public option, which affect the prices of private goods (and vice versa) in equilibrium. I demonstrate how these equilibrium effects change both the optimal quality and optimal allocation: they create new incentives to distort quality in either direction depending on the policymaker's redistributive objective and provide a new justification for rationing the public option rather than using market-clearing prices. Finally, I show how my results can accommodate additional frictions in the private market and additional policy instruments.

"Robust Bounds for Welfare Analysis" with Shoshana Vasserman

Revision requested at the American Economic Review, *accepted for presentation at EC'22*

Economists routinely make functional form assumptions about consumer demand to obtain welfare estimates. How sensitive are welfare estimates to these assumptions? We answer this question by providing bounds on welfare that hold for families of demand curves commonly considered in different literatures. We show that commonly chosen functional forms, such as linear, exponential, and constant elasticity of substitution (CES) demand, are extremal in different families: they yield either the highest or lowest welfare estimate among all demand curves in those families. To illustrate our approach, we apply our results to the welfare analysis of energy subsidies, trade tariffs, pensions, and income taxation.

"Contracting and Vertical Control by a Dominant Platform" with Ellen V. Muir

Accepted for presentation at EC'22

We study a platform that sells productive inputs (such as e-commerce and distribution services) to a fringe of producers in an upstream market, while also selling its own output in the corresponding downstream market. The platform faces a tradeoff: any output that it sells downstream increases competition with the fringe of producers and lowers the downstream price, which in turn reduces demand for the platform's productive inputs and decreases upstream revenue. Adopting a mechanism design approach, we characterize the optimal menu of contracts the platform offers in the upstream market. These contracts involve price discrimination in the form of nonlinear pricing and quantity discounts. If the platform is a monopoly in the upstream market, then we show that the tradeoff always resolves in favor of consumers and at the expense of producers. However, if the platform faces competition in the upstream market, then it has an incentive to undermine this competition by engaging in activities, such as "killer" acquisitions and exclusive dealing, that harm both consumers and producers.

"Fixed-Price Approximations to Optimal Efficiency in Bilateral Trade" with Jan Vondrák

This paper studies fixed-price mechanisms in bilateral trade with ex ante symmetric agents. We show that the optimal price is particularly simple: it is exactly equal to the mean of the agents' distribution. The optimal price guarantees a worst-case performance of at least 1/2 of the first-best gains from trade, regardless of the agents' distribution. We also show that the worst-case performance improves as the number of agents increases, and is robust to various extensions. Our results offer an explanation for the widespread use of fixed-price mechanisms for size discovery, such as in workup mechanisms and dark pools.

CONFERENCE PUBLICATIONS	**"Fixed-Price Approximations in Bilateral Trade"** with Francisco Pernice and Jan Vondrák, in *Proceedings of the 2022 Annual ACM–SIAM Symposium on Discrete Algorithms (SODA'22)*, pp. 2964–2985, 2022.
OTHER PUBLICATIONS	**"General Theories of Reflection and Transmission Scratch Holograms"** with Bingjian Li, Jiahuang Lin, Ye Yeo, and Guoxian Tan, in *Canadian Journal of Physics*, **95**(5), pp. 432–419, 2017.
	"The Vertical Oscillations of Coupled Magnets" with Kewei Li, Jiahuang Lin, Samuel Yee and Jeremias Wong in *European Journal of Physics* [Special Issue] **32**(4), pp. S1–S14, 2011.

HONORS AND FELLOWSHIPS	Regulatory Policy Fellowship, Stanford Institute for Economic Policy Research (SIEPR)	2022
	Jaedicke Merit Award, Stanford Graduate School of Business	2018
	Phi Beta Kappa	2018
	Firestone Medal for Excellence in Undergraduate Research, Stanford University	2017
	J. E. Wallace Sterling Award for Scholastic Achievement, Stanford University	2017
	President's Award for Academic Excellence in the Freshman Year, Stanford University	2015
	Gold Medal, International Physics Olympiad	2011
	Gold Medal (Champion Team), International Young Physicists' Tournament	2010

SEMINARS AND CONFERENCES	Bocconi (Decision Sciences); Group for Research in Applied Economics; Michigan; Northwestern (Kellogg); Not The 2023 Theory Market; NUS; Pittsburgh; Rochester (Simon); Toronto; UGA; Yale (SOM); EC'23; Markets, Contracts, and Organizations Conference	2023
	Group for Research in Applied Economics; Berkeley/Columbia/Duke/MIT/Northwestern IO Theory Conference; EC'22; FTC Microeconomics Conference	2022
	EC'21; INFORMS	2021
	Young Researcher Workshop on Economics and Computation (YoungEC'19)	2019
REFEREEING	*American Economic Review, AER Insights, Econometrica, Journal of Economic Theory, Journal of Political Economy, Mathematics of Operations Research, Review of Economic Studies*	