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Fields of Concentration

Primary Field(s): Microeconomic Theory
Secondary Field(s): Industrial Organization

Desired Teaching:

Microeconomics, Mechanism Design, Game Theory

Comprehensive Examinations Completed:

2019 (Oral): Microeconomic Theory, Macroeconomics
2018(Written): Microeconomics, Macroeconomics

Dissertation Title: *Essays in Industrial Economics*

Committee:

Professor Larry Samuelson (Chair)
Professor Philipp Strack
Professor Kai Hao Yang

Degrees:

Ph.D., Economics, Yale University, 2023 (expected)
M.Phil., Economics, Yale University, 2020
M.A., Economics, Yale University, 2019
M.A., Economics, Seoul National University, 2016
B.S., Mathematical Science, *Summa Cum Laude*, Seoul National University, 2014
B.A., Economics, *Summa Cum Laude*, Seoul National University, 2014

Fellowships, Honors and Awards:

University Dissertation Fellowship, Yale University, 2022–2023
Cowles Foundation and Economic Growth Center Fellowship, 2017-2021
Yale University Fellowship, 2017-2023
Doctoral Study Abroad Fellowship, the Korean Government Study Abroad Scholarship

Program (NIIED), 2017-2019
Social Sciences Korea Research Assistant Scholarship, National Research Foundation of Korea, 2016-2017
Brain Korea 21 Research Assistant Scholarship, National Research Foundation of Korea, 2015-2016
Gold Prize at the University Students Contest of Mathematics, Korean Mathematical Society, 2013.
National Science and Engineering Scholarship for undergraduate studies (merit-based), Korea Student Aid Foundation, 2007- 2014
General Paik Sun Yup Leadership Award, 8th U.S. Army, 2010.
Two Army commendation medals, 8th U.S. Army, 2009 and 2010.
One of the 12 finalists for the Korean team for the 46th and 47th International Mathematical Olympiad (IMO), 2005 and 2006
Silver and Bronze Prize at the 17th and 18th Asian Pacific Mathematical Olympiad (APMO), 2005 and 2006.

Teaching Experience:

Teaching assistant for undergraduate classes at Yale University

Spring 2021, Game Theory, Prof. Ben Polak

Fall 2020, Intermediate Microeconomics, Prof. Mira Frick

Spring 2020, Mathematical Economics: Game Theory, Prof. Philipp Strack

Fall 2019, Intermediate Microeconomics, Prof. Evangelia Chalioti

Teaching assistant for graduate and undergraduate classes at Seoul National University

Spring 2017, Microeconomics, Prof. Son ku Kim

Fall 2016, Topics in Microeconomics (Doctoral-level information economics), Prof. Son ku Kim

Spring 2015, Economics of Contract, Prof. Son ku Kim

Fall 2014, Advanced Microeconomics (Core Graduate course), Prof. Son ku Kim

Spring 2014, Mathematics for Economics, Prof. Son ku Kim

Research and Work Experience:

Research Assistant to Prof. Jihong Lee, Seoul National University, 2015-2016

Korean Augmentation To the United States Army (KATUSA), 8th US Army, 2009-2010

Working Papers:

“Screening without Single Crossing”, November 2022, *Job Market Paper*

“Taxation and Durable Goods Monopoly” with Jihong Lee, forthcoming in *Journal of Industrial Economics*

“Optimal Information Disclosure with Moral Hazard”, July 2022

Seminar and Conference Presentations:

2022: Durham Economic Theory Conference

Languages:

English (fluent), Korean (native)

References:

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Dissertation Abstract

Screening without Single Crossing [Job Market Paper]

The single crossing property typically plays crucial role in finding the optimal mechanism for a screening problem. However, single crossing requires the agent's preference to be captured by a single dimensional characteristic, and it fails in many interesting real-world examples with multidimensional allocations. This paper asks when a screening problem that fails single crossing can be reduced to an equivalent problem with the single crossing property.

I consider a screening problem with a single principal and a single agent. The agent's payoff-relevant type is his private information. The screening problem is a *single crossing problem* if the agent's types and the allocations can be respectively ordered so that higher types have stronger preferences for higher allocations. In the absence of single crossing, the optimal mechanism takes many different forms depending on the agent's type distribution, ranging from the simplest take-it-or-leave-it offer to a continuum of lotteries. In this paper, I provide a sufficient condition under which the principal can restrict attention, without profit loss, to a subset of the allocations (denoted by X) over which the agent's preference has the single crossing property. The single crossing property then allows us to find the optimal mechanism among those with simple structures characterized by monotonicity and binding local incentive compatibility constraints.

The sufficient condition requires the agent's types can be ordered in such a way that each of two marginal rates of substitution is increasing in type. The increasingness of the first marginal rate of substitution ensures that the optimal mechanism for the principal need only use the allocations in X . The increasingness of the second marginal rate of substitution ensures that the agent's preferences over the allocation subset X satisfy the single crossing property.

Using the result, I derive new sufficient conditions for the optimality of simple mechanisms that have nested forms in various economic settings: Upgrade pricing in multiple good monopoly, selling only goods with balanced attributes in product line design, and no screening with the same cap in delegation problem. In contrast to results in the existing literature, if the agent's type set satisfies the conditions, the simple mechanisms are robustly optimal with respect to distribution over the set. Moreover, the sufficient conditions are also necessary for the robust optimality of the simple mechanisms when the reduced single crossing screening problem satisfies the property in a strict sense.

Taxation and Durable Goods Monopoly, with Jihong Lee, forthcoming in *Journal of Industrial Economics*

This paper studies the role of taxation in durable good markets with dynamic monopolies. By conditioning the marginal tax rate on the volume of trade, the regulator can provide incentives for the monopolist to accelerate trade. When marginal cost pricing generates a loss for the monopolist and the regulator faces a budget constraint, strategic delay cannot be avoided under regulatory budget constraint and the effects of tax policy depend on the monopolist's ability to commit. In the context of binary consumer types, we find a tax policy involving “back-loaded subsidy” that achieves the second-best outcome with commitment. In contrast, without commitment, a “front-loaded subsidy” improves welfare.

Optimal Information Disclosure with Moral Hazard

This paper studies a moral hazard problem in which the principal can ex ante commit to an information disclosure policy to control the agent's incentives. The outcome depends on the unverifiable state of nature, in addition to the agent's effort choice. I characterize the principal's optimal disclosure policy. The critical aspect of the problem is the relation between the order of the increase in the success probability by working and the order of the rate of the increase, across states. Necessary and sufficient conditions for the optimality of full and no disclosure are derived. I also discuss intermediate forms of disclosure.