SIWON RYU (류시원, 柳視遠)

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Research Fields

Econometrics, Program Evaluation, Network Economics, Health Economics.

Education

Ph.D. in Economics, Rice University	May 2025 (expected)
M.A. in Economics, Seoul National University	2020
B.A. in Economics, Kyung Hee University	2017

Working Papers

"Decomposition of Causal Effect Accounting for Network Change" (Job market paper)

This study analyzes an identification and estimation for the causal treatment effect, explicitly considering network changes resulting from treatment. Compared to the classical approach in program evaluation literature that assumes independent units, recent empirical studies emphasize the significance of spillover effects. However, these studies often assume that the underlying network is fixed or unaffected by treatment. At the same time, there has been some empirical evidence that treatment can also affect the network. This study analyzes the identification of the causal effect of treatment with interference between units and also accounts for possible network changes. The main contribution of this study is the decomposition of the causal effect into two distinct parts: the effect of treatment when the network remains unchanged and the effect when only the network structure is changed by the treatment. This approach enhances our understanding of the mechanisms of a policy or program by explicitly considering counterfactual scenarios in which the network is changed or unchanged due to treatment. Additionally, the study addresses quasi-experimental situations, providing a Difference-in-Differences approach.

"Local Average Treatment Effects with Imperfect Compliance and Interference"

This study addresses the identification and estimation of causal effects in scenarios where units interact and imperfect compliance is present. In cases where treatment take-up is endogenous due to imperfect compliance, the standard solution is to use the treatment assignments as instruments for the treatment take-up to identify the local average treatment effects (LATE). The key assumption for identifying LATE is monotonicity in potential treatments. This paper extends this approach to situations involving the interaction of two units by introducing a weak concept of monotonicity that is a generalization of the restrictions on the potential treatment, such as monotonicity and one-sided noncompliance. Under weak monotonicity, this study proposes a general identification result in this setting, provided that additional exclusion restrictions for the compliance patterns exist. This identification can be applied to situations where traditional assumptions may not be fully satisfied. A two-stage estimator for the identified parameters is introduced, with its properties evaluated through simulation studies. The proposed method is illustrated by real-world data from a randomized experiment that provided access to a savings account.

"Direct and Indirect Treatment Effects with Social Interaction"

This study analyzes identification and estimation of treatment effects in the presence of social interactions. The potential outcomes are functions of one's treatment status and exposures, where exposure is influenced by the treatments of neighbors. If the exposures are determined by own treatment, then the treatment effect can be decomposed into direct and indirect effects using a mediation model approach. If exposure is determined by the underlying random graph of the network, it can be interpreted as the treatment having indirect effects by altering the underlying network structure. Therefore, exposures mediates the own treatment, and the variation of the mediator due to the treatment identifies the direct and indirect treatment effects separately. Monte Carlo studies and empirical applications about the impact of co-educated high school on academic performance, demonstrate that the proposed estimators and decompositions work effectively.

Work in progress

"When Your Child Is Sick: Parental Labor Supply Response to Severe Child Health Shock (with Jungmin Lee and Hyuncheol Bryant Kim)"

In this paper, we examine how parents respond to severe health shocks in their children. To identify the causal effects of childhood cancer diagnosis on parents' labor market outcomes, we construct a control group that matches the treatment group with children diagnosed with cancer and conduct an event study with a dynamic difference-in-differences specification. Using administrative data from the Korean National Health Insurance System (NHIS), we find that the mother's labor supply declines sharply after the diagnosis of cancer in children, while the effect on the father's labor supply is not statistically significant. The mother's labor force participation rate drops by 8.6 percentage points, and the effect is persistent in the long run. We discuss potential mechanisms for the disparity in the impact of children's health between parents.

Scholarships, Honors, and Awards

John R. Kelly Graduate Student Teaching Prize in Economics, Rice University	2023
Robin C. Sickles Award for Best Performance in Qualifying Exams, Rice University	2022
Maria Esther and Carlos Linares Award for Best Performance in Courses, Rice University	2021
Graduate Fellowship, Rice University	2020-Present
Graduate Teaching Assistantship, Rice University	2020-Present
Science Korea Research Assistantship, Korea Research Foundation	2019-2020
Teaching and Research Assistantship, Seoul National University	2018-2019
Brain Korea 21 Plus Research Assistantship, Seoul National University	2018

Teaching Assistant

"Econometrics I & II" (graduate, instructor: Xun Tang, Matthew Thirkettle, Rice University)	2021-2024
"Topics in Econometrics" (graduate, instructor: Yoon-Jae Whang, Seoul National University)	2019
"Econometrics" (graduate, instructor: Yoon-Jae Whang, Seoul National University)	2018-2019
"Macroeconomics I & II" (undergraduate, instructor: Wooheon Rhee, Kyung-Hee University),	2015

Research Assistant

"Research Project of Job Displacement and The Economic, Health Outcomes" using Database of Korea National Insurance Service (NHIS), with Jungmin Lee, Hyuncheol Bryant Kim, Jisoo Hwang 2019-2020

"Establishment The Database for The Socio-Economic Level of Korea" using Database of Korea National Insurance Service (NHIS), with Jungmin Lee 2018-2019

Research Analyst, Korea Institute for Industrial Economics and Trade (KIET) 2014

Conferences and Presentations

Texas Econometrics Camp, Houston, Texas 2024

Others

Programming Skills:	Matlab, Stata, SAS, R, Python, Julia, SQL, Git
Languages:	English (Fluent), Korean (Native)

References

Professor Xun Tang (Chair)
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