

# HYUKJUN KWON

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## EDUCATION

### Rutgers University, USA

Ph.D. in Economics

May 2024 (expected)

### Pennsylvania State University, USA

M.A. in Economics

2018

### Seoul National University, Korea

M.A. in Economics

2016

### Republic of Korea Naval Academy, Korea

B.E. and B.A in Military

2009

## RESEARCH INTERESTS

High-dimensional Models, Factor Analysis, Causal Inference

## JOB MARKET PAPER

Inference for Low-rank Models without Estimating the Rank

**Abstract:** This paper studies inference in linear models, where the parameter of interest is a high-dimensional yet low-rank matrix coefficient. We develop a debiasing procedure for nuclear norm penalized estimator, resulting in asymptotically normal estimators with estimable variance. Remarkably, our procedure is robust to rank misspecification, making it a promising alternative to existing debiasing procedures that require the true rank of the low-rank matrix, especially in applications where the rank estimation can be unreliable. Our procedure consists of two main components: bias corrections and low-rank projections. In particular, the low-rank spaces are estimated through pre-specified weighting matrices, called diversified weights. The rank of these matrices is not necessarily equal to the true rank. As a result, however, the resulting projection estimators are inconsistent to the true projections, introducing new challenges in the distributional characterization. Nonetheless, we successfully address these issues in our procedure. Empirically, we apply our method to the U.S. federal grants allocation data and test the existence of pork-barrel politics. Several approaches to estimate the rank in this data do not provide a unified result, making our estimation more relevant.

## WORKING PAPERS

Inference for Low-rank Completion without Sample Splitting with Application to Treatment Effect Estimation (with Jungjun Choi, Yuan Liao)

R&R at *Journal of Econometrics*

Justified-envy-minimal Efficient Mechanisms for Priority-based Matching (with Ran Shorrer)

R&R at *Games and Economic Behavior*

## TEACHING EXPERIENCE

Instructor, Rutgers University

- Econ Data Science, Advanced Analysis for Economics (co-teaching with Prof. Yuan Liao)      Spring 2023

- Econometrics      Summer 2022

- Math Camp for Incoming Econ Graduate Students      Summer 2022, Summer 2021

Teaching Assistant (graduate courses), Rutgers University      2019 – 2022

Econometrics (x4), Macroeconomics (x1)

Teaching Assistant (undergraduate courses), Rutgers University      2019 – 2022

Forecasting and Big Data (x2), Introduction to Econometrics (x2), Econ Data Science (x1), Women, Men, and Economy (x1), Financial Economics (x1), Energy Economics (x1)

## HONORS AND AWARDS

Dorothy Rinaldi Award, Rutgers University      2023

*In recognition of outstanding scholarship, leadership, and service to other graduate students*

Sidney I. Simon Prize for Outstanding Graduate Student Teaching, Rutgers University      2023

*In recognition of outstanding teaching by a graduate student*

Professor Hiroki Tsurumi Graduate Dissertation Fund in Economics, Rutgers University      2022

*In recognition of exceptional dissertation research by advanced graduate students*

Sidney I. Simon Award, Rutgers University      2021

*In recognition of outstanding second year research paper*

Rie Ashizawa Memorial Award, Rutgers University      2019

*In recognition of outstanding performance on the qualifying examinations*

## PRESENTATIONS

Econometrics Seminar, University of Connecticut      Oct 2023 (scheduled)

Midwest Econometrics Group (MEG) Conference      Oct 2023 (scheduled)

International Conference on Computational Statistics (COMPSTAT)      Aug 2023

International Conference on Econometrics and Statistics (EcoSta)      Aug 2023

## SKILLS AND PERSONAL

Programs: Matlab, Julia, Python, L<sup>A</sup>T<sub>E</sub>X

Languages: English (fluent), Korean (native)

Military Service: Lieutenant, Republic of Korea Navy      2009 – 2014

## REFERENCES

**Professor Yuan Liao (Chair)**

Rutgers University  
[yuan.liao@rutgers.edu](mailto:yuan.liao@rutgers.edu)  
(848) 932-8621

**Professor Norman Swanson**

Rutgers University  
[nswanson@economics.rutgers.edu](mailto:nswanson@economics.rutgers.edu)  
(848) 932-7432

**Professor Roger Klein**

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