Gokul Gopalan Ramachandran

PhD Candidate in Economics
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EDUCATION

University of Warwick *2021 –*
PhD in Economics
Supervisors: Eric Renault and Kenichi Nagasawa

University of Warwick *2021 – 2023*
Master of Research in Economics *Distinction*

Princeton University *2018 – 2020*
Master in Public Affairs GPA: 3.77
Economics and Public Policy Field GPA: 3.92

National Institute of Technology, Calicut *2006 – 2010*
Bachelor of Technology in Electronics and Communication GPA: 8.53/10

FIELDS

Research Econometrics

Teaching Econometrics (PhD & Undergraduate), Probability and Statistics (Undergraduate)

JOB MARKET PAPER

Inference with Granular Instruments in Large Panels [arXiv] [Code]

Granular Instrumental Variables (GIV), introduced by Gabaix and Koijen (2024), use idiosyncratic shocks to large units as instruments for aggregate endogenous variables. I develop asymptotic theory for GIV in large panels where both the cross section and time series grow ($N, T \to \infty$). I make two main contributions. First, I show that estimating the individual shocks used to construct the granular instrument has a first-order effect on the asymptotic variance of the GIV estimator. Existing methods do not account for this effect, leading to incorrect standard errors. I derive corrected inference. Second, I characterize how instrument strength changes as N grows, yielding strong, nearly-weak, and weak regimes. In the newly characterized nearly-weak regime, the instrument vanishes asymptotically but the estimator remains consistent and asymptotically normal, at a slower rate, when T grows sufficiently fast relative to N. I apply the theory to estimate short-run supply and demand elasticities for crude oil, copper, and natural gas.

WORKING PAPER

Efficiency of Granular Instrumental Variables and Asymptotic Distributions with Estimated Factor Loadings [Draft]
with Kenichi Nagasawa and Eric Renault

We study efficiency and inference for granular instrumental variable estimators with a fixed number of cross-sectional units. We show that the efficient instrument equals the share-weighted granular instrument of Gabaix and Koijen plus an additional term, which leads to efficiency gains. When factor loadings are unknown, we provide conditions under which the loadings and the idiosyncratic error covariance matrix are identified while allowing for cross-sectional heteroscedasticity. We then propose GMM estimators whose inference accounts for the estimation of the factor structure. In an application to the global crude oil market, we provide estimates of oil demand and supply elasticities, which are robust to heteroscedasticity.

WORK IN PROGRESS

Interactive Fixed Effects with Heterogeneous Parameters
with Kenichi Nagasawa

We study interactive fixed effects panel models with common time-series regressors whose slope coefficients vary across units. Such heterogeneity is common in applications. Existing estimators either impose common slopes or require additional structure to accommodate slope heterogeneity. We propose a computationally tractable semiparametric estimator based on kernel methods to separate the heterogeneous slopes from the factor structure. In this work in progress, we aim to derive the estimator's asymptotic distribution as both the cross section (N) and the time dimension (T) grow, and characterize how estimation error in the factor structure interacts with bandwidth choice.

CONFERENCES

- First UK Graduate Econometrics Network Workshop, University of Warwick *Jun 2026*
- Econometrics Seminar, Universidad Autónoma de Madrid *Jan 2026*
- 4th International Econometrics PhD Conference, Erasmus University Rotterdam *Nov 2025*

TEACHING

Senior Graduate Teaching Assistant *2022 –*
University of Warwick

- EC9A3: Econometric Theory (PhD Year 1) *Spring 2024, 2025, 2026*
- EC140B: Mathematical Techniques B (undergraduate; Alex Dobson) *Fall 2024*
- EC203: Applied Econometrics (undergraduate; Tom Martin) *Fall 2023*
- EC124: Statistical Techniques B (undergraduate; Jeremy Smith) *Spring 2023*

RESEARCH EXPERIENCE

Research Assistant, Elizabeth Levy Paluck's Lab *Fall 2019 & Spring 2020*
Professor of Psychology and Public Affairs, Princeton University

WORK EXPERIENCE

Between 2011 and 2018, and again in 2020–21, I was a civil servant in the career track of India's highest civil service: the Indian Administrative Service. I led major development initiatives for the State of Kerala, rising to be the Acting Secretary to the Government in the Budget Wing (third highest rank in the department). Some of the highlights of my work:

- Acting Secretary to Government (Finance-Resources), Government of Kerala *2020 – 2021*
- District Collector and Chief Executive Officer, Idukki District *2016 – 2018*
- State Mission Director, National Health Mission, Government of Kerala *2015 – 2016*

ACADEMIC AWARDS

- Tutor Award for Outstanding Evaluation, University of Warwick
- Economic and Social Research Council DTP Award *2023 – 2027*
- Department of Economics Fellowship for MRes, University of Warwick *2021 – 2023*
- Karl E. Prickett Fellow in Public and International Affairs, Princeton University *2019 – 2020*
- Princeton University Graduate Fellowship *2018 – 2020*
- National rank of 19 (out of 650,000) in the All India Civil Services Examination *2010*
- Second in Regional Mathematical Olympiad *2004*

SERVICE

- Co-Founder, United Kingdom Graduate Econometrics Network (UK-GEN) *2026 –*
- PhD Representative, Student-Staff Liaison Committee, University of Warwick *2022 – 2025*
- Graduate Associate, Center for Public Finance and Policy, Princeton University *2019 – 2020*
- Elected member, Social Service Society, National Academy of Administration *2011 – 2013*

TRAINING

- Data Science Workshop, University of Warwick *Summer 2024*
  Mateusz Stalinski, Nathan Canen, Rafael Jimenez
- Causal Machine Learning, Study Center Gerzensee *Summer 2024*
  Victor Chernozhukov

PROGRAMMING

Matlab, Stata, R, Python, Git, LaTeX

REFERENCES

- **Eric Renault**
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