Robin Danko

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Research

Working Papers

Cluster-Robust Standard Errors when Treatment Effect Vary Across Clusters: A Design-Based Approach **[Job Market Paper]**

Clustered standard errors are common tools used by empirical researchers in the social sciences to obtain valid inference. Clusters can be defined by geography or by social strata such as gender. Typically, cluster-robust errors adjust for correlations induced by sampling the outcome from a data-generating process with correlated cluster-level components. The data-generating process is typically assumed to either contain a small, finite, and fixed number of clusters or an infinite number of clusters. In this paper, I show that when modeling clusters as finite features of a population, conventional cluster-robust standard errors can be severely inflated when the number of clusters is large enough for valid asymptotic approximation. I propose new standard errors that correct this bias.

2SLS Variance Adjusting for Design-Based Uncertainty: Inference and Estimation

In the typical approach to inference in the social sciences, researchers assume that a negligibly small sample is drawn from a large population. While natural in many applications, it is less natural in other instances such as when doing inference on statewide data when data on all 50 states is available; in this case the sample does not differ from the population. In this article, I apply a design-based approach to analyze the population variance of the 2SLS estimator. Design-based uncertainty explicitly considers the unknown counterfactual outcomes under alternative treatment schemes. I derive standard errors of the 2SLS estimator that consider both design-based and sampling-based uncertainty. I show that these new standard errors are generally smaller than the usual infinite population sampling-based standard errors and provide conditions under which they coincide.

Education

Ph.D. Economics 2021-2026 (expected)
Michigan State University
Committee: Antonio F. Galvao, Ilya Kachkovskiy, Timothy J. Vogelsang, Jeffrey M. Wooldridge (chair)

B.A. Mathematics 2018-2021
University of Oklahoma

B.A. Economics 2018-2021
University of Oklahoma

Teaching

Department of Economics, Michigan State University East Lansing, MI
Instructor

- EC420-731 Introduction to Econometric Methods Summer 2024
- EC301-730 Intermediate Microeconomics Summer 2023

Teaching Assistant (Graduate Level)

- EC823 Applied Econometrics Spring 2025
- EC821A Cross Section and Panel Data Econometrics I Fall 2024

- EC820B Econometrics 1B — Spring 2024
- EC820A Econometrics 1A — Fall 2023
- EC812A Microeconomics 1 and its Mathematical Foundations — Fall 2022

Teaching Assistant

- EC420 Introduction to Econometric Methods — Fall 2025
- EC499 Spring Seminar for Economics Majors — Spring 2025
- EC251H Microeconomics and Public Policy — Spring 2023, Spring 2022
- EC301 Intermediate Microeconomics — Fall 2021

Employment History

Department of Economics, Michigan State University — East Lansing, MI
Research Assistant for Dr. Richard Baillie — Fall 2023

Honors and Awards

Department of Economics, Michigan State University — East Lansing, MI
Red Cedar Award for Best Third-Year Paper, Michigan State University — Spring 2024
Honorable Mention for First-Year Coursework, Michigan State University — Spring 2022

Skills

STATA (MATA), R, Python