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Abstract

Many empirical studies in economics use a variety of nonparametric or semiparametric techniques, including propensity score-based estimators or selection models, to estimate average treatment effects or causal effects under endogenous selection or assignment to treatments.

In some researches they may be a cluster problem, in which common cluster-specific factors, such as geographic factors in regional economic studies or school factors in educational studies, may yield correlation across observations within clusters.

Application of estimation methods previously proposed for single level datasets without clusters, to multilevel data with clusters is not a trivial endeavor because endogenous (nonrandom) allocation to clusters should be treated properly.

Some existing studies have been done on robust inference for clustered data, however, they assume exogenous allocation to clusters, which can yield biased under endogenous allocation to clusters.

In this research, we demonstrate that ignoring endogeneity of allocation to clusters may yield severely biased estimates, introduce a new potential outcome framework for causal inference for clustered data, and propose a robust estimation method for marginal multilevel model under endogenous assignment and allocation.

The proposed framework also reveals a possible bias in the estimation of site-by-treatment interaction effects from multisite randomized trials prevailing in medical researches or experimental economics, and provides a solution to this problem.

We will show that the proposed method is more efficient than alternative methods such as direct application of previous methods and parametric regression adjustment methods, when the effect of covariates on the potential outcomes differs depending on the level-2 units.

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