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Inference of heterogeneous treatment effects using observational data with high-dimensional covariates. (English)  
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Summary: This study proposes novel estimation and inference approaches for heterogeneous local treatment effects using high-dimensional covariates and observational data without a strong ignorability assumption. To achieve this, with a binary instrumental variable, the parameters of interest are identified on an unobservable subgroup of the population (compliers). Lasso estimation under a non-convex objective function is developed for a two-stage generalized linear model, and a debiased estimator is proposed to construct confidence intervals for treatment effects conditioned on covariates. Notably, this approach simultaneously corrects the biases due to high-dimensional estimation at both stages. The finite sample performance is evaluated via simulation studies, and real data analysis is performed on the Oregon Health Insurance Experiment to illustrate the feasibility of the proposed procedure.

MSC:
62-XX Statistics

Keywords:
causal inference; high-dimensional data; instrumental variable; non-convexity; two-stage regression

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