

An Approach Combining Theory, Simulations and Empirics Provides Evidence of Regularities in the Bias of Observational Methods*

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Abstract

In this paper, I propose to combine theory, simulations and empirics in order to investigate the existence of regularities in the bias of observational methods of causal inference, with the final goal of making them more reliable. In my proposal, general properties of observational estimators are derived thanks to stylized theoretical models while the magnitude and direction of the bias in a particular application are estimated using simulations of more realistic models. The predictions from theory and simulations are then compared with empirical estimates of the bias of observational methods. I use the proposed approach to study the properties of Difference-In-Differences (DID) and Matching when evaluating the effect of Job Training Programs on earnings. Theory and simulations suggest that applying DID symmetrically around the treatment date without Matching on pre-treatment earnings should perform better than the intuitive approach of combining DID with Matching on pre-treatment earnings. This prediction is confirmed by previously unnoticed empirical results. I interpret this result as suggesting the possibility of the existence of regularities in the bias of observational methods and the ability of the proposed approach to help find them. I conclude with directions for further research.

Keywords: Observational Methods - Causal Inference - Treatment Effects - Selection Bias - Difference In Differences - Matching.

JEL codes: C21, C23.

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