

SBA Invited Research Seminar

Causal Inference by Using the Observation Weights Matching Method

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**ZOOM 861 5877 4855, Oct. 15th (Fri) 10:00 ~
(This seminar will be held in **Korean**)**



Abstract

Identifying the causal effects of treatment from observational data is difficult when the treatment cannot be randomly assigned. In such a scenario, matching methods are generally used to estimate the causal effects by comparing the treated and control units. Matching methods can be viewed as an attempt to emulate a random assignment. However, given that the true propensity score for matching is unknown to the researcher, we propose that using a conventional matching method could have two critical limitations: 1) model dependency and 2) a fixed sample size (i.e., small variance). To overcome the model dependency problem, we propose a new matching algorithm that sequentially generates a weighted data distribution (resulting in observation weights) to reduce model dependency and to identify the common support. In addition, to mitigate the problems caused by a fixed sample size, we propose using the critical value () of a matched sample, which is a measure of the degree of imbalance on a matched sample, as selected by the user. Our simulation and empirical results demonstrate that the proposed approach provides excellent imbalance measures in comparison to genetic matching, coarsened exact matching, and propensity score matching. The proposed method's primary advantage over other matching methods is rooted in its model dependency and sample variance because 1) it does not require a fixed sample size since it uses the critical value and 2) we can identify the accurate critical value from observation weights using a sequential learning algorithm, which reduces model dependency

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