
Mediating Analysis with Mismeasured Variables via SIMEX Method

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ABSTRACT

The casual relations among the variables of interest may be directed or transmitted by the other variable or variables. The standard mediation analysis including a series of linear regressions is used to estimate these casual direct/indirect relationships among the variables. It is well documented that the ordinary least square (OLS) estimators are biased and inconsistent under the presence of the measurement error in regressors. The simulation extrapolation (SIMEX) method is the most common method for the measurement error models. The goal of this paper is to show the success of SIMEX after the theoretical inferences about what happens to the OLS estimators with the error-prone variables. The theoretical inferences and the simulation results show that the existence of measurement error in the variables leads to biased parameter estimates. Therefore, this increases the probability of wrong decisions for testing the mediating effect via Sobel's test which is the most common test. Although the SIMEX method used to correct the biasedness of estimates, the standard errors of these estimates are obtained greater than as usual. Finally, the results suggest that the SIMEX method can be revised for the Sobel's test statistics to reveal the real mediating affect.

KEYWORDS Mediating analysis; Sobel's z-score; measurement errors; ordinary least squares; SIMEX

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