

The Effect of Non-Normality on CB-SEM and PLS-SEM Path Estimates

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Abstract : The two common approaches to Structural Equation Modeling (SEM) are the Covariance-Based SEM (CB-SEM) and Partial Least Squares SEM (PLS-SEM). There is much debate on the performance of CB-SEM and PLS-SEM for small sample size and when distributions are non-normal. This study evaluates the performance of CB-SEM and PLS-SEM under normality and non-normality conditions via a simulation. Monte Carlo Simulation in R programming language was employed to generate data based on the theoretical model with one endogenous and four exogenous variables. Each latent variable has three indicators. For normal distributions, CB-SEM estimates were found to be inaccurate for small sample size while PLS-SEM could produce the path estimates. Meanwhile, for a larger sample size, CB-SEM estimates have lower variability compared to PLS-SEM. Under non-normality, CB-SEM path estimates were inaccurate for small sample size. However, CB-SEM estimates are more accurate than those of PLS-SEM for sample size of 50 and above. The PLS-SEM estimates are not accurate unless sample size is very large.

Keywords : CB-SEM, Monte Carlo simulation, normality conditions, non-normality, PLS-SEM

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