LATENT VARIABLE MODELS UNDER MISSPECIFICATION: TWO STAGE LEAST SQUARES (2SLS) AND FULL INFORMATION MAXIMUM LIKELIHOOD (FIML) ESTIMATORS

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ABSTRACT

The Full Information Maximum Likelihood (FIML) estimator is by far the dominant estimator for Structural Equation Models (SEMs) with latent variables. Bollen (1996) proposed an alternative Two Stage Least Squares (2SLS) estimator for latent variable SEMs. Analytically, the FIML and 2SLS estimators under correct specification are consistent, asymptotically unbiased, asymptotically normal, and have known asymptotic standard errors. When observed variables have no excess kurtosis, the FIML is asymptotically efficient. In models without latent variables, the 2SLS estimator appears more robust to specification errors.

In this study we use Monte Carlo simulations to examine the 2SLS and FIML estimators in sample sizes ranging from 50 to 1000 and in models with varying degrees of specification error. We consider three versions of the 2SLS estimator that are distinguished by the number of instrumental variables used. Overall these results suggest that the 2SLS estimator with fewer instrumental variables performed well under misspecification and correctly specified models across different sample sizes. In large samples and correct specifications, the estimators had similar performance. Contrary to our expectations the variance of the FIML estimator was not markedly superior to 2SLS even under a correct specification.