

Title: Generalized Method of Moments Estimation of Errors-in-Variables in Dynamic Models

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Abstract:

Measurement error is pervasive in survey data. Its existence in the explanatory variables violates basic assumption in regression model which lead to biased and inconsistent Ordinary Least Squares (OLS) estimates. Instrumental variables estimation is typically used to address the problem, which pave way for the development of the Generalized method of Moments (GMM) estimation.

Dynamic model was considered in this study whgich, like Errors-in-Variables (EIV) models, violates the exogeneity assumption in regression. Measurement errors, also referred to as EIV, are incorporated in the model for which a system GMM estimator was derived, particularly Blundell-Bond Estimator for EIV in dynamic model which is referred to as system estimator in this study. The system estimator was applied to swine production data and was compared to the existing Blundell-Bond estimator which does not assume measurement errors.

Results of this study show that for the swine production data, there is little percent difference between the parameter estimates of the two estimators both in the first step and the second step. Its standard errors, however, differ significantly in the first step where these are higher when measurement error is present in the data. Hence, measurement errors affect only the first step standard errors for the said data.