Comparative Assessment Of Simultaneous Equation Techniques To Correlated Random Deviates

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The problems of multi collinearity, non spherical disturbances and measurement errors are overcome by the use of Monte Carlo experiments, which are essentially computer simulation. Three categories of correlation between pairs of random deviates are considered to determine how these categories perform given a simultaneous equation model with one identified and one over identified equations. The robustness of five estimators to the inadvertent correlation of the stochastic terms is compared. The ranking of the estimators with respect to the magnitude of the average total bias is invariant to the choice of the upper, $P_1$, or lower, $P_2$, triangular matrices. Three Stage Least Squares (3SLS) ranked best generating the minimum Average Total Absolute Bias (TAB), closely followed by Limited Information Maximum Likelihood (LIML) while the Full Information Maximum Likelihood (FIML) performed poorly. FIML is remarkably best in the open-ended intervals and remarkably poor at the closed intervals. The magnitudes of the estimates yielded by two estimators, OLS and 3SLS exhibited fairly consistent reaction to changes in magnitudes and direction of correlations of error terms.

Keywords: Monte Carlo, Random Deviates, Simultaneous Equation, Total Absolute Bias, Root Mean Square Error.