

EFFICIENCY OF STOCHASTIC RESTRICTED LIU ESTIMATOR ON INCOMPLETE DATA REGRESSION MODEL

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It is well known that standard statistical procedures assume the availability of complete data sets. However, when collecting data one is confronted with the problem of incomplete data set. In such cases missing data may have a strong influence on the statistical analysis of the remaining data set.

Several methods have been developed for handling missing values in the regression matrix, and have been investigated the efficiency of the corresponding estimators. The most popular method of handling missing values is known as complete case analysis, in which the statistician simply ignores incomplete observations and analyze the remaining data, which is however not a successful method. An alternative method, known as imputation method, is to fill the gaps in the regressor matrix, which can be done by using some standard methods namely the Zero-Order regression method, the First Order regression method and the maximum likelihood estimation method etc.

Hill and Ziemer (1983) applied the mixed estimation procedure as a tool for combining originally observed data with incomplete data sets. Toutenburg (1985) proved that under some conditions the biased mixed regression estimator for the combined model of complete observations set with filled observations set outperforms the Ordinary Least Squares Estimator (OLSE) for the model based on the complete case analysis with respect to the MSE-matrix sense.

In this study the Stochastic Restricted Liu Estimator (SRLE) introduced by Hubert and Wijekoon (2004) is used as an estimator for the combined model, and the Liu estimator in place of OLSE was taken as an estimator that comes under the complete case analysis. Their mean squared error matrices were used to compare the efficiency of the estimators. The necessary and sufficient conditions are obtained for the superiority of Stochastic Restricted Liu estimator over the Liu estimator with respect to the MSE-matrix criterion.

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