Bootstrap Simulation Procedure Applied to the Selection of the Multiple Linear Regressions

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Abstract. This article considers the analysis of multiple linear regressions (MLR) that is used frequently in practice. We propose new approach could be used to guide the selection of the "true" regression model for different sample size in both cases of existing and not existing of multicollinearity, first-order autocorrelation, and heteroscedasticity. We used simulation study to compare eight model selection criteria in terms of their ability to identify the "true" model with the help of the new approach. The comparison of the eight model selection criteria was in terms of their percentage of number of times that they identify the "true" model with the help of the new approach. The simulation results indicate that overall, the new proposed approach showed very good performance with all the eight model selection criteria where the GMSEP, JP, and SP criteria provided the best performance for all the cases. The main result of our article is that we recommend using the new proposed approach with GMSEP, or JP, or SP criteria as a standard procedure to identify the "true" model.

Keywords: Multiple Linear Regression; Information Criteria; Bootstrap Procedure; MCB Procedure.