

Dynamic robust bootstrap method based on LTS estimators

ABSTRACT

The applications of bootstrap methods in regression analysis have drawn much attention to the statistics practitioners because of some practical reasons. In order to make reliable inferences about the parameters of a model, require that the parameter estimates are normally distributed. Nevertheless, in real situations, many estimates are not normal and the use of bootstrap method is more appropriate as it does not rely on the normality assumption. It is now evident that the presence of outliers have an unduly effect on the bootstrap estimates. There is a possibility that the bootstrap samples may contain more outliers than the original sample. In this paper, we propose a robust bootstrap algorithm based on Least Trimmed of Squares (LTS) estimator which will be unaffected in the presence of outliers. We call this method Dynamic Robust Bootstrap-LTS based (DRBLTS) because here we have employed the LTS estimator in the modified bootstrap algorithm. The performance of the DRBLTS is evaluated by real data sets and simulation study. The numerical examples indicate that the DRBLTS is more efficient than the other methods.

Keyword: Bootstrap samples; Outliers; LTS; Bias estimation and RMSE