

## **Effects of a single outlier on the coefficient of determination: an empirical study**

### **ABSTRACT**

This article investigates the effects of outliers on the coefficient of determination,  $R^2$  which is computed by Ordinary Least Squares (OLS) estimator. It is now evident that the OLS is greatly affected by outliers and hence the  $R^2$  is also affected. This problem can be solved by using the robust estimators such as Least Trimmed Squares (LTS) estimator. In this article, we compare the value of  $R^2$  which is computed by OLS and LTS estimators. We modify a regression data set to effectively generate outliers in both X and Y directions. Then the coefficient of determination (OLS and LTS) is investigated from the modified data sets (data with outliers). The numerical results show the merit of using the LTS based  $R^2$  estimator compared to the OLS estimator.

**Keyword:** Outlier; Coefficient of determination; LTS estimator