

The performance of robust two-stage estimator in nonlinear regression with autocorrelated error.

ABSTRACT

Some statistics practitioners often ignore the underlying assumptions when analyzing a real data and employ the Nonlinear Least Squares (NLLS) method to estimate the parameters of a nonlinear model. In order to make reliable inferences about the parameters of a model, require that the underlying assumptions, especially the assumption that the errors are independent, are satisfied. However, in a real situation, we may encounter dependent error terms which prone to produce autocorrelated errors. A two-stage estimator (CTS) has been developed to remedy this problem. Nevertheless, it is now evident that the presence of outliers have an unduly effect on the least squares estimates. We expect that the CTS is also easily affected by outliers since it is based on the least squares estimator, which is not robust. In this article, we propose a Robust Two-Stage (RTS) procedure for the estimation of the nonlinear regression parameters in the situation where autocorrelated errors come together with the existence of outliers. The numerical example and simulation study signify that the RTS is more efficient than the NLLS and the CTS methods.

Keyword: Autocorrelated error; Nonlinear regression; Outliers.