A New Stochastic Restricted Two Parameter Estimator in Multiple Linear Regression Model

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Instead of using the Ordinary Least Square Estimator (OLSE) to estimate the regression coefficients, the biased estimators are proposed in the multiple linear regression to overcome the multicollinearity among the predictor variables. An alternative technique to solve the multicollinearity problem is to consider parameter estimation with some restrictions on the unknown parameters, which may be exact or stochastic restrictions. In this research, we propose a biased estimator, namely new stochastic restricted two parameter estimator (NSRTPE) in a multiple linear regression model to tackle the multicollinearity problem when the stochastic restrictions are available. The proposed estimator over the ordinary least square estimator (OLSE), ridge estimator (RE), Liu estimator (LE), almost unbiased Liu estimator (AULE), modified new two parameter estimator (MNTPE), mixed estimator (ME), stochastic restricted Liu estimator (SRLE) are compared in the scalar mean square error (SMSE) sense through a simulation study by considering different levels of multicollinearity and different values of shrinkage parameters (k and d) selected within the interval 0 to 1. From the simulation study, it can be noticed that the proposed estimator performs well than existing estimators when the value of d is large. Furthermore, it can be observed that the proposed estimator is always superior to MNTPE. Finally, it could be concluded that the proposed estimator is meaningful in practice.

***Keywords*:** Multiple linear regression; Multicollinearity; Stochastic restriction; New stochastic restricted two parameter estimator; Scalar Mean square error