On the Performance of Improvised Generalized M-Estimator in the Presence of High Leverage Collinearity Enhancing Observations

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Abstract : Multicollinearity occurs when two or more independent variables in a multiple linear regression model are highly correlated. The ridge regression is the commonly used method to rectify this problem. However, the ridge regression cannot handle the problem of multicollinearity which is caused by high leverage collinearity enhancing observation (HLCEO). Since high leverage points (HLPs) are responsible for inducing multicollinearity, the effect of HLPs needs to be reduced by using Generalized M estimator. The existing GM6 estimator is based on the Minimum Volume Ellipsoid (MVE) which tends to swamp some low leverage points. Hence an improvised GM (MGM) estimator is presented to improve the precision of the GM6 estimator. Numerical example and simulation study are presented to show how HLPs can cause multicollinearity. The numerical results show that our MGM estimator is the most efficient method compared to some existing methods.

Keywords : identification, high leverage points, multicollinearity, GM-estimator, DRGP, DFFITS
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