

SOME PROPERTIES OF GENERALIZED RIDGE-TYPE SHRINKAGE ESTIMATORS

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ABSTRACT

In this paper, we propose a generalized ridge-type estimator for the estimation of regression coefficients in the presence of multicollinearity in the design matrix. The first two exact moments and the expressions for the Relative Bias (RB), Relative Mean Square Error (RMSE) and Relative Efficiency (RE) of this estimator are derived. A numerical comparison of relative efficiency of this estimator with respect to Ordinary Least Square Estimator (OLSE) and the ridge estimator studied in [1] is also presented.

INTRODUCTION

For the coefficients in a simple regression model, Hoerl and Kennard in references [2] and [3] proposed the ridge regression method of estimation and defined a class of estimators characterized by scalar. Recently, for the initial choice of a characterising scalar as recommended by Hoerl and Kennard [2]; Dwivedi et al [1] obtained the first two exact moments of the individual coefficient assuming the normality of disturbances. From these moments they derived the expressions for the RB, RMSE, and RE and presented a numerical comparison with the OLSE.

In this article, we propose a generalized ridge-type estimator obtained by replacing the characterizing scalar by some function of the Least Squares estimates. To measure the performance of our estimator, we follow [1] and investigate the RB, RMSE and RE of the estimator.

THE MODEL AND THE ESTIMATOR

Consider the model

$$Y = X\alpha + \epsilon$$