A SIMULATION STUDY OF SOME SHRINKAGE ESTIMATORS

Meral Ebegil*, Fikri Gökpinar* and Müslüm Ekni*

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Abstract

In regression analysis, it is desired that no multicollinearity should exist between the independent (explanatory) variables. In the cases where this is not achieved, the use of the Least Square (LS) estimation method leads to mismodelling. Some methods have been developed to solve this problem; one of which is the ‘biased estimation method’. In this study, a test statistics for Ridge and Liu estimators, that are shrinkage biased estimators, is analyzed. Moreover, these estimators are compared via simulation, in terms of different correlation coefficients between the independent variables.

Keywords: Linear Admissible Estimators, Mean Square Error, Central-F Approximations, Liu Estimator.

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1. Introduction

Multiple linear regression is one of the statistical methods in widespread use that help one to bring out relationships between variables. Researchers working on data analysis use the multi linear regression method for forming models. The most common method used for estimating the regression coefficients is the LS method. However, in order for the LS method to give valid results, some assumptions need to be made.

In multiple linear regression analysis, there should be no relations between the independent variables. Nevertheless, in reality, this may not always be realized. Using the LS estimation method in this case may lead to an improper use of the model. Some methods have been developed to allow the analysis of the case when the independent variables depend on each other. One of these methods is the biased estimation method. The most widely used biased estimation methods are; principal components regression, ridge regression and their variations. Estimations produced by biased methods are more biased than the LS estimators are, but they produce less variable estimations. The main

*Gazi University, Faculty of Arts and Sciences, Department of Statistics, Ankara, Turkey.