

C723909 : MAJOR STATISTICS

KEY WORD: Multicollinearity / Ordinary Least Square / Ridge Regression / Bootstrap

PAVANA MASPOL : CONFIDENCE INTERVALS ESTIMATION OF MULTIPLE REGRESSION
COEFFICIENTS HAVING MULTICOLLINEARITY IN INDEPENDENT VARIABLES.

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The objective of this research is to compare the confidence intervals estimation method of multiple regression coefficients having multicollinearity in independent variables by comparing their confidence levels and average lengths of confidence interval. The estimation method under consideration in this research are :

1. The interval estimation method with t distribution by using Ordinary Least Square estimator (OLS)
2. The interval estimation method with t distribution by using Ridge Regression estimator (RHK,RLW)
3. The interval estimation method with bootstrap method by using Ridge Regression estimator (BHK,BLW)

This research used sample sizes of 15, 30, 40 and 50. The residuals having normal distribution with mean 0 and variance 2.0 , lognormal distribution with mean 0 and variance 1.0 , T distribution degree of freedom 4. The correlation levels between independent variables equal to 0.0, 0.5, 0.7, 0.9 and the given confidence coefficients values 90%, 95% , 99%. The data is obtained through simulation using Monte Carlo technique and repeating 500 time for each case.

The conclusions of this research are as follows:

1. The confidence levels.

The confidence levels for all estimation methods are not lower than the given confidence coefficients values (90% , 95% , 99%) , all distributions , all sample sizes , and all correlation levels between independent variables.

2. The average lengths of confidence interval.

In case of small sample size (n=15) , the given confidence coefficients values equal to 90% , 95% , all distributions , and all correlation levels , BHK method has shortest average lengths of confidence interval but when the given confidence coefficients is add up to 99% , RHK method has shortest average lengths of confidence interval.

In case of medium sample size (n=30) , the given confidence coefficients values equal to 90% , 95% , the residuals having normal and lognormal distribution , and all correlation levels , BHK method has shortest average lengths of confidence interval but when the given confidence coefficient value is add up to 99% , RHK method has shortest average lengths of confidence interval.

In case of medium sample size (n=40) , the residuals having T distribution , all of the cases considered , RHK method has shortest average lengths of confidence interval.

In case of large sample sizes (n=50) , all of the cases considered , RHK method has shortest average lengths of confidence interval.

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