

# BOOTSTRAP CONFIDENCE INTERVAL FOR MODIFIED LINEAR REGRESSION ESTIMATION OF THE POPULATION MEAN

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## Abstract

Ratio estimator is used to estimate the population mean, but it has biased property. Linear regression estimator is proposed to solve this bias problem. Several modified version of this estimator that were proposed, some has smaller variance.

Performance of the estimator can always be improve using using values of the population parameter of the auxiliary variable under study which are positively correlated with the study variable. A class of modified linear regression estimators for the population mean of the form

$$\hat{Y}_{SK} = \alpha \frac{S_y}{C_y} + (1 - \alpha) \left( \bar{y} - \frac{b_{yx}}{\rho} (\bar{x} - \bar{X}) \right)$$

where  $b_{yx} = \frac{s_{yx}}{s_x^2}$ , is proposed by Subramani and Kumarapandiyana(2012). This form of estimator gives smaller value of variance and therefore perform better. Bootstrap confidence interval as well as its coverage probability for population mean using this estimator is constructed in this paper.

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Key words : sample random sampling, auxiliary variable, linear regression estimator, mean squared error, bootstrap confidence interval