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Dual of Ratio Estimators of Finite Population Mean Obtained on Using Linear Transformation to Auxiliary Variable

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Abstract: The efficiencies of the ratio- type estimators have been increased by using linear transformation on auxiliary variable in the literature. But such type of estimators requires the additional knowledge of unknown population parameters, which restricts their applicability. Keeping in view such restrictions, we have proposed two unbiased estimators of population mean of study variable on applying linear transformation to auxiliary variable by using its extreme values in the population that are generally available in practice. The comparison of the proposed estimators with the existing ones have been done with respect to their variances. It has also been shown that the proposed estimators have greater applicability and are more efficient than the mean per unit estimator even when the existing estimators are less efficient. We have also shown that under some known conditions the choice of most efficient estimators among the considered ones can be made for a given population. The theoretical results obtained are shown diagrammatically and have been verified numerically by taking some empirical populations.

Key words: bias, efficiency, most efficient estimator, preference region, simple random sampling without replacement, unbiased estimator, variance

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