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A Generalized Family of Estimators for Estimation of Unknown Population Variance in Simple Random Sampling

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Abstract : This paper is addressing the estimation method of the unknown population variance of the variable of interest. A new generalized class of estimators of the finite population variance has been suggested using the auxiliary information. To improve the precision of the proposed class, known population variance of the auxiliary variable has been used. Mathematical expressions for the biases and the asymptotic variances of the suggested class are derived under large sample approximation. Theoretical and numerical comparisons are made to investigate the performances of the proposed class of estimators. The empirical study reveals that the suggested class of estimators performs better than the usual estimator, classical ratio estimator, classical product estimator and classical linear regression estimator. It has also been found that the suggested class of estimators is also more efficient than some recently published estimators.

Keywords : study variable, auxiliary variable, finite population variance, bias, asymptotic variance, percent relative efficiency
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