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An Efficient Class of Chain Estimators of Population Variance under Sub-Sampling Scheme

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Abstract: For estimating the population variance S^2_y of study variable y, a class of chain estimators of S^2_y has been proposed in the presence of two auxiliary variables x and z by using known information on population mean and variance of the second auxiliary variable z. In this proposed class, the second auxiliary variable z is directly highly correlated with the first auxiliary variable x, whereas the variable z is correlated with the variable y due to only the high correlation between the variables y and x. Another generalized class of estimators of S^2_y has also been considered by using the same available information of auxiliary variable z when both the auxiliary variables x and z are directly highly correlated with the study variable y. The asymptotic expressions for the mean square errors and their optimum values have been obtained. A comparison between the two proposed classes of estimators of S^2_y has been made empirically.

Key words: auxiliary variable, chain estimator, consistent estimator, double sampling technique, mean square error, optimum estimator, study variable

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