

**AN EXACT EXPRESSION FOR THE MEAN SQUARE ERROR OF RATIO ESTIMATOR,
REGRESSION ESTIMATOR AND GENERALIZED REGRESSION ESTIMATOR IN FINITE
POPULATION SAMPLING**

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ABSTRACT

Following Rao (1979) an attempt has been made to derive an exact expression for the mean square error of ratio estimator, regression estimator, generalized regression estimator, separate ratio and regression estimator and combined ratio and regression estimator in stratified random sampling and also an exact expression for an unbiased estimator of their mean square error. Noting that Rao's (1979) procedure fails to derive an exact expression for the mean square error of product estimator of the population total, an alternative procedure is suggested to get an exact expression for the variance of a homogeneous linear unbiased estimator of the population total and also an exact expression for an unbiased estimator of the variance of the estimator. This procedure is illustrated in case of Horvitz-Thompson (1952) estimator, Hansen-Hurwitz (1943) estimator based on PPSWR sampling, Murthy's(1957) unordered estimator based on PPSWOR sampling, ratio estimator based on Lahiri (1951), Midzuno (1952) and Sen's (1953) sampling scheme and Hartley – Ross (1954) unbiased ratio type estimator based on SRSWOR sampling scheme.

KEYWORDS: Generalized Regression Estimator, Homogeneous Linear Unbiased Estimator, Mean Square Error, Ratio Estimator, Regression Estimator, Separate and Combined Ratio Estimator, Separate and Combined Regression Estimator