Abstract

In this study performance of different ratio and ratio type estimators have been evaluated directly and under Jack-knife method. The performance is judged on the basis of Relative Efficiency with reference to Classical Ratio Estimate.

After describing basic theory of sampling along with Jack-knife method of reducing bias and mean square error, a brief history and description of different ratio & ratio type estimators have been given.

Empirical study of all the estimators along with their Jack-knife versions is carried out for different hypothetical and natural populations, by drawing all possible simple random samples of various sizes, without replacement.

It is found that Classical Ratio Estimate is more efficient in approximately 50% of the populations for sample size 2. It remains more efficient for relatively large sample sizes i.e. $n=3, 4, 6$ and 8 but the percentage of cases varies from 30.0% to 45.0%. For $n=12$ the percentage of cases slightly reduces and becomes 25%.

The percentages of cases different estimators, other than Classical Ratio, are better varies for different sample sizes.

The Jack-knife method of reducing bias and mean square error comes out to be more useful for relatively large sample sizes and reduces bias and mean square error in about 50% to 80% of the cases for sample size 6 and above.