Inference Using a Variety of Ranked Set Sampling

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Abstract

As a variation of ranked set sampling (RSS), double ranked set sampling (DRSS) was introduced by Al-Saleh and Al-Kadiri (1999), and it has been used only for estimating the mean of the population. DRSS will be used for estimating the distribution function (df). The efficiency between the estimators will be obtained in two cases: When ranking is perfect and when ranking is imperfect.

Weighted double extreme ranked set sample (WDERSS) will be used for estimating the df and the quantiles of the location and scale distributions for a given probability value (p). It will be shown that WDERSS provides approximately an unbiased estimator for the df in case of small sample size and asymptotically an unbiased estimator for the population quantiles for a fixed value of p. Applications to estimating the location ($\theta$) and scale ($\beta$) parameters for some parametric models are provided.

Also, WDERSS is used for estimating the population mean for location and scale distributions. This will be applied on skewed distributions.

All the suggested estimators which given in this thesis will be shown to be more efficient than the corresponding estimators obtained by using SRS, RSS or weighted extreme ranked set sample (WERS).