Estimation of a parameter of Morgenstern type bivariate exponential distribution by ranked set sampling

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Abstract Ranked set sampling is applicable whenever ranking of a set of sampling units can be done easily by a judgement method or based on the measurement of an auxiliary variable on the units selected. In this work, we consider ranked set sampling, in which ranking of units are done based on measurements made on an easily and exactly measurable auxiliary variable X which is correlated with the study variable Y. We then estimate the mean of the study variate Y by the BLUE based on the measurements made on the units of the ranked set sampling regarding the study variable Y, when (X, Y) follows a Morgenstern type bivariate exponential distribution. We then consider unbalanced multistage ranked set sampling and estimate the mean of the study variate Y by the BLUE based on the observations made on the units of multistage ranked set sample regarding the study variable Y. Efficiency comparison is also made on all estimators considered in this work.