

Correlation Estimation in the Downton's Bivariate Exponential Distribution Using Incomplete Samples

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Suppose (X, Y) has a Downton's bivariate exponential distribution with correlation ρ . For a random sample of size n from (X, Y) , let $X_{r:n}$ be the r th X -order statistic and $Y_{[r:n]}$ be its concomitant. We investigate estimators of ρ when all the parameters are unknown and the available data is an incomplete bivariate sample made up of (i) all the Y values and the ranks of associated X values, i.e., $(i, Y_{[i:n]})$, $1 \leq i \leq n$, and (ii) a Type II censored bivariate sample consisting of $(X_{i:n}, Y_{[i:n]})$, $1 \leq i \leq r < n$. In both setups, we use simulation to examine the bias and mean square errors of several estimators of ρ and obtain their estimated relative efficiencies. The preferred estimator under (i) is a function of the sample correlation of $(Y_{i:n}, Y_{[i:n]})$ values, and under (ii), a method of moments estimator involving the regression function is preferred. (This is a joint work with Dr. Qinying He, Southwestern University of Finance and Economics, Chengdu, Sichuan, China)

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