

Minimum Quadratic Distance Estimators  
for the Zeta Parametric Family

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Abstract

The zeta distribution is a discrete distribution which has been relatively little used in actuarial science and statistics, a reason being that most estimators proposed in the literature for the parameter of this distribution require iterative methods or the extensive use of tables for its calculation, due to the complicated form of its probability mass function. We propose a new estimator, based on quadratic distance, asymptotically fully efficient for parameter values greater than 2 and highly efficient for smaller values, but computationally more appealing than the maximum likelihood estimator; we compare its asymptotic variance with that of the moment estimator and an estimator proposed by Seal, based on the ratio of the observed frequencies of the first two classes. We also discuss a goodness-of-fit test and a test to discriminate between the zeta distribution and the Poisson distribution truncated at 0.

