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Estimators of the Regression Parameters of the Zeta Distribution

by

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ABSTRACT

The zeta distribution with regression parameters has been rarely used in statistics because of the difficulty of estimating the parameters by traditional maximum likelihood. We propose an alternative method for estimating the parameters based on an iteratively reweighted least-squares algorithm. The quadratic distance estimator (QDE) obtained is consistent, asymptotically unbiased and normally distributed; the estimate can also serve as the initial value required by an algorithm to maximize the likelihood function. We illustrate the method with a numerical example from the insurance literature; we compare the values of the estimates obtained by the quadratic distance and maximum likelihood methods and their approximate variance-covariance matrix. Finally, we calculate the bias, variance and the asymptotic efficiency of the QDE compared to the MLE for some values of the parameters.