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On the tail index of a heavy tailed distribution

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Abstract This paper proposes some new estimators for the tail index of a heavy tailed distribution when only a few largest values are observed within blocks. These estimators are proved to be asymptotically normal under suitable conditions, and their Edgeworth expansions are obtained. Empirical likelihood method is also employed to construct confidence intervals for the tail index. The comparison for the confidence intervals based on the normal approximation and the empirical likelihood method is made in terms of coverage probability and length of the confidence intervals. The simulation study shows that the empirical likelihood method outperforms the normal approximation method.

Keywords Confidence interval · Coverage probability · Empirical likelihood · Tail index estimation · Edgeworth expansion