

A Comparison of Various Tail Index Estimators

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Abstract

Since heavy-tailed distributions are used for modeling in the growing fields of finance, telecommunications, and insurance; there is an increase in demand for methodologies to estimate the tail indices. We began our project studying two of the classical estimators, Hill and Pickands. Our aim was to test the accuracy of these estimators based on their mean squared errors (MSE) by designing our own code, which we ran in RStudio. After studying the advantages and disadvantages of both estimators, we began to explore the new estimator, Rojo1, developed by Dr. Javier Rojo. Using various heavy-tailed distributions, we created multiple simulations which suggested that the new estimator Rojo1 is more accurate when compared to the Hill and Pickands estimators, based on the MSE.

EXTREME SPACING TECHNIQUES FOR TAIL CLASSIFICATION

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Abstract

Two separate methods dealing with ideas of blocking and extreme spacings are considered and used to test hypotheses concerning an underlying distributions tail-heaviness based on results from Rojo and Ott (2010). The first method focuses on a maximum extreme spacing while the other examines a weighted sum of extreme spacings. Simulation results for both methods showed that the tests yielded considerable power with low probability of Type I error for finite sample sizes. When compared with the original test by Rojo and Ott (2010), it is concluded that these new tests are, at best, competitive with Rojo and Ott's (2010) for certain distributions, but do not provide comparable power overall.