Extremes of two-step regression quantiles

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Abstract

We deal with estimators of extreme value index based on two-step regression quantiles in the linear regression model. Two-step regression quantiles can be seen as a possible generalization of the quantile idea and as an alternative to regression quantiles of Koenker and Basset (1978). We derive the approximation of the tail quantile function of errors in the model on the basis of the two-step regression quantiles. Following Drees (1998) we consider a class of smooth functionals of the tail quantile function as a tool for the construction of estimators in the linear regression context. The chief examples of estimators derived in this way are versions of Pickands, maximum likelihood and probability weighted moments estimators. We illustrate the results on simulated data and real datasets such as Condroz data from Beirlant et al. (2004).

Keywords

Two-step regression quantile, Tail quantile function, Stochastical functional, Extreme value index.

References

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