Estimators of the extreme value index based on quantile regression

Jan Dienstbier, dienstbi@karlin.mff.cuni.cz

Department of Probability and Statistics, MFF UK, Solovská 83, 186 75, Praha 8, Czech Republic

Keywords: extreme value index, quantile regression

AMS: 60G70

Abstract

In the contribution we discuss an estimation of the extreme value index in the case of linear regression model. We propose estimators based on the extreme regression quantiles slightly expanding older results of Chernozhukov (2005). Our aim is to describe a general class of estimators of the extreme value index based on regression quantiles. We show consistency and asymptotic normality of estimators belonging to this class using methodological tools based on Drees (1998) and Gutenbrunner et al. (1993). Various conditions and their necessity are discussed. We demonstrate a performance of proposed estimators on a small simulation study.

Acknowledgements: This work was supported by Czech Republic Grant GAČR 201/05/H007.

References

[1] Chernozhukov V. (2005) Extremal Quantile Regression, Annals of Statistics, Vol. 33, 2, 806–839

[2] Drees, H. (1998a) On smooth statistical tail functionals, Scand. J. Statist., 25, 187–210.

[3] Drees, H. (1998b) A general class of estimators of the extreme value index, J. of Stat. Planning and Inference, 55, 95–112

[4] Gutenbrunner, C., Jurečková J., Koenker R. and Portnoy, S., (1993) Tests of linear hypotheses based on regression rank scores, Nonparametric Statistics, Vol. 2, 307–331