

Institut für Ökonometrie und Statistik

Forschungsseminar

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On the block maxima method in multivariate extremes

Abstract

The core of the classical block maxima method consists of fitting an extreme value distribution to a sample of maxima over blocks extracted from an underlying series. In asymptotic theory, it is usually postulated that the block maxima are an independent random sample of an extreme value distribution. In practice however, block sizes are finite, so that the extreme value postulate will only hold approximately. A more accurate asymptotic framework is that of a triangular array of block maxima, the block size depending on the size of the underlying sample in such a way that both the block size and the number of blocks within that sample tend to infinity. The copula of the vector of componentwise maxima in a block is assumed to converge to a limit, which, under mild conditions, is then necessarily an extreme value copula. Under this setting and for absolutely regular stationary sequences, the empirical copula of the sample of vectors of block maxima is shown to be a consistent and asymptotically normal estimator for the limiting extreme value copula. Moreover, the empirical copula serves as a basis for rank-based, nonparametric estimation of the Pickands dependence function of the extreme value copula. The results are illustrated by a small simulation study.