Semi-parametric models for the multivariate tail dependence function - the asymptotically dependent case

Abstract:
In general, the risk of joint extreme outcomes in financial markets can be expressed as a function of the tail dependence function of a high-dimensional vector after standardizing marginals. Hence it is of importance to model and estimate tail dependence functions. Even for moderate dimension, nonparametrically estimating a tail dependence function is very inefficient and fitting a parametric model to tail dependence functions is not robust. In this paper we propose a semi-parametric model for (asymptotically dependent) tail dependence functions via an elliptical copula. Based on this model assumption, we propose a novel estimator for the tail dependence function, which proves favorable compared to the empirical tail dependence function estimator, both theoretically and empirically.

Stichworte:
Asymptotic normality, Dependence modeling, Elliptical copula, Elliptical distribution, Regular variation, Semi-parametric model, Tail dependence function

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