Modeling Jump Dependence using Lévy Copulas

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Abstract.
By the Lévy-Khintchine representation, a bivariate Lévy process can be uniquely specified by a triplet (γ, A, ν), with $\gamma \in \mathbb{R}^2$, A a positive semi-definite 2×2 matrix, and the (Lévy) measure ν. The dependence in the continuous part of the process is determined by A, and from the measure ν a so-called Lévy copula is defined to describe dependence in the jumps.

Assuming a parametric family for the Lévy copula, an M-estimator of the unknown parameter vector is introduced, based on high-frequency data. The conditions under which this estimator exists, and conditions for its asymptotic properties:consistency and asymptotical normality, are presented. The performance of the estimator is illustrated on a known parametric model in a detailed simulation study, and on an example with real data.