

MULTI-NORMEX APPROACH FOR EVALUATING THE SUM OF HEAVY TAILED RANDOM VECTORS

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We build a sharp approximation of the whole distribution of the sum of iid heavy-tailed random vectors, combining mean and extreme behaviors. It extends the so-called 'Normex' approach from a univariate to a multivariate framework. We propose two possible multi-normex distributions, named d -Normex and MRV-Normex. Both rely on the Gaussian distribution for describing the mean behavior, via the CLT, while the difference between the two versions comes from using the exact distribution or the EV theorem for the maximum. The main theorems provide the rate of convergence for each version of the multi-normex distributions towards the distribution of the sum, assuming second order regular variation property for the norm of the parent random vector when considering the MRV-normex case. Numerical illustrations and comparisons are proposed with various dependence structures on the parent random vector, using QQ-plots based on geometrical quantiles. This is joint work with Marie Kratz.