

## Hidden regular variation: fine-tuning risk assessment

Bikramjit Das\*, Singapore University of Technology and Design\*, *bikram@sutd.edu.sg*  
Abhimanyu Mitra, Cornell University, USA.  
Sidney Resnick, Cornell University, USA.

### Abstract:

It is well-known that a Gaussian dependence structure implies *asymptotic independence* in the sense that, two correlated risk factors which are jointly normally distributed are extremely unlikely to take very high (or low) values together (unless they are completely dependent). This is obviously true for many other dependence structures beyond the Gaussian. We concentrate on multivariate regularly varying distributions (our paradigm for multivariate heavy-tailed distributions) which often exhibit a similar property of asymptotic independence. Under asymptotic independence, though a joint extreme event is quite unlikely, yet it is still possible. We provide a formulation of *hidden regular variation* to find the part that is missed under the cruder normalization of multivariate regular variation in such cases and discuss some statistical estimation procedures for assessing probabilities of such joint risk events under this definition of hidden regular variation.

### Keywords:

Regular variation, hidden regular variation, risk estimation, multivariate dependence.

## References

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