TVaR-based capital allocation with dependence

Etienne Marceau, Université Laval, Canada
Co-Authors: Hélène Cossette; Mélina Mailhot, Université Laval, Canada

The present study considers an insurance portfolio consisting of several dependent risks and aims to evaluate not only the capital allocation for the overall portfolio but also the contribution of each risk over their aggregation. We use the Tail Value at Risk (TVaR) as risk measure. We consider the following dependence models: multivariate compound distributions, models based on common mixtures and models based on copulas. We present special cases where exact expressions for the TVaR of the sum of the risks and for the TVaR-based allocations. We then propose numerical methods applicable for any proposed dependence models in order to approximate the TVaR of the aggregate risk for the portfolio and the contribution of each risk of the portfolio. Several numerical examples are presented in order to illustrate the topics exposed in the paper. An important aspect of the paper is to provide tools for practical applications.