Aggregation of Dependent Risks: A Survey of Some Recent Results

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Abstract

In this talk we review some recent methodologies for the aggregation of dependent risks. The distribution of the sum of dependent risks is a relevant topic in actuarial sciences, risk management and in many branches of applied probability.

First, we review some models of risk aggregation when we have a portfolio of dependent risks modelled with a Farlie-Gumbel-Morgenstern copula (Cossette et al., 2013). Then, we consider some extensions of this model using the Sarmanov-Lee distribution (Hashorva and Ratovomirija, 2015; Vernic, 2016).

Because the multivariate Pareto distributions seem to be an outstanding candidate to model dependent risks, we consider the model by Sarabia et al. (2016), which studies risk aggregation for this class of distributions.

Finally, we review the aggregation of dependent risks in mixtures of exponential distributions (Sarabia et al., 2018). The dependence structure of this model is Archimedean and we study in detail some specific multivariate models with claims of the type Pareto, Gamma, Weibull, inverse Gaussian mixture of exponentials and other parent distributions.