Abstract

One of the most critical problems in casualty property insurance is to determine an appropriate reserve for the incurred but unpaid losses. The provisions are generally the largest part of the liabilities of a non-life insurance company. It is therefore vital for a company to accurately estimate its global provisions.

The global provisions are often determined under an assumption of independence between the lines of business. Such an assumption is inappropriate in numerous situations and may have an impact on the uncertainty of the overall provisions. We propose to model this dependence relation with a flexible class of hierarchical Archimedean copulas. It is capable of modelling high-dimensional joint distributions of payments in different run-off triangles with a richer rank correlation structure than existing models.

We will also introduce other models, capturing the dependence between calendar years using multivariate copulas.

Keywords: Run-off triangle, GLM, Copula Regression, Hierarchical Archimedean Copula, Maximum Likelihood Estimation, Bootstrap.