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Multivariate Dependent Frequency-Severity Modeling of Insurance Claims: A Vine Copula Approach

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Abstract : In traditional models of insurance data, the number and size of claims are assumed to be independent. Relaxing the independence assumption, this article explores the Vine copula to model dependence structure between multivariate frequency and average severity of insurance claim. To illustrate this approach, we use the Wisconsin local government property insurance fund which offers several insurance protections for motor vehicles, property and contractor's equipment claims. Results show that the C-vine copula can better characterize the multivariate dependence structure between frequency and severity. Furthermore, we find significant dependencies especially between frequency and average severity among different coverage types.

Keywords : dependency modeling, government insurance, insurance claims, vine copula
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