

Multivariate collective risk models

Inference and special case

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Abstract

Univariate collective models have played an important role in Actuarial Mathematics. The inference about these models is usually made for the totals of claims.

We now present a multivariate version of these models that may be of interest, as a special case, for application in forest fires. The inference in this case is now made for the total burnt area and the number of fires.

Keywords

Collective models, asymptotic distributions, confidence intervals, risk theory.

References:

- Bowers, N.L.; Gerber, H.U.; Hickman, J.C.; Jones, D.A. and Nesbet, C.J. (1986). *Actuarial Mathematics*. The Society of Actuaries.
- Cantarinha, A.; Moreira, E.; Oliveira, M.; Mexia, J. (2022). A risk model for forest fires based on asymptotic results for multivariate collective models. Single models and structured families of models. *Communications in Statistics – Theory and Methods*.
- Mexia, J. T. (1990) *Variance free models*, Trabalhos de Investigação, N° Departamento de Matemática, Faculdade de Ciências e Tecnologia. Universidade Nova de Lisboa.
- Marques, S.; Borges, J. G.; Garcia-Gonzalo, J.; Moreira, F.; Carreiras, J.M.B.; Oliveira, M.M.; Cantarinha, A.; Botequim, B. and Pereira, J. M. C. (2011). Characterization of wildfires in Portugal. *European Journal of Forest Research*, **130**(5): 775–784.