

Pricing of Catastrophe Cover in Life Reinsurance

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What is the correct price of a catastrophe cover in life reinsurance? During a review of the current standard model due to Strickler (1960) we find that this model has some serious shortcomings. We therefore present a new model for the pricing of catastrophe excess of loss cover (Cat XL). The new model for annual claim cost C is based on a compound Poisson process of catastrophe costs. To evaluate the distribution of the cost of each catastrophe we use the Peaks Over Threshold model for the total number of lost lives in each catastrophe and the beta binomial model for the proportion of these corresponding to customers of the insurance company. To be able to estimate the parameters of the model, two data sets with catastrophe data were collected and compiled, one international with catastrophes claiming at least 20 lives and one Swedish, listing accidents claiming at least 4 lives. Fitting the new model to data, we find the fit to be good. We also present how to extrapolate data, thus being able to draw conclusions about catastrophes claiming less than 20 lives. Finally we give the price of a Cat XL contract and perform a sensitivity analysis of how the parameters affect the expected value and standard deviation of the cost and thus the price.