

An Application of EVT, GPD and POT Methods in the Albanian Insurance Market

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Abstract

Despite its relatively fast development, the insurance sector in Albania suffers from lack of experience, and lack of a database with historical records to make risk assessments feasible and to enable risk calculation. Consequently the newly established companies that operate in the insurance market in Albania cope with difficulties to make accurate calculations of reinsurance premium, i.e. the premium paid by a ceding company to an reinsurer in exchange of the liability assumed by the reinsurer. Given the situation, this research paper aims to provide an alternative way to make pure premium estimations.

We have taken in consideration a dataset of fire insurance and other perils' claims, which have taken place in the Albanian insurance market during 2007 to 2014 period. Prices have been inflated to take into account the inflation of the period. There are $n = 401$ fire insurance and other peril losses, the largest among them is € 1.203.798, the average is $\bar{z} = € 20.156$ and the standard deviation is $s = € 83.037$. The skewness coefficient, $\zeta = 9,94$, indicates that the right tail is heavy, with considerable scope for large losses.

Let D denote the level of retention or deduction for the ceding company. Firstly, the reinsurance pure premium is estimated using the empirical method based in two factors, the Survival functions¹ of X evaluated in D and the mean excess function of X with respect to the deducible D . Secondly, the study analyses the Exceedances distribution limit checking the distribution goodness-of-fit of GPD-type claims (Generalized Pareto Distribution). The GPD parameter estimation has been made by the maximum likelihood method using EVIM² toolbox in Matlab. Then, we have calculated reinsurance pure premium with a parametric method.

Keywords: *Excess of Loss, Extreme value theory, GPD.*

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