

Bivariate Non-central Pólya-Aeppli Distribution. An Application to Insurance Risk Theory

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Abstract

In this paper we consider a random variable, which is a sum of Poisson distributed and Pólya-Aeppli distributed variables [1,2]. We called the resulting distribution a Noncentral Pólya-Aeppli distribution. We discuss a number of properties of this distribution including the probability generating function, correlation structure, probability mass function and recursion formulas. Moment estimation of the parameters is also discussed and illustrated with a numerical example. Then by the trivariate reduction method we introduce a bivariate Noncentral Pólya-Aeppli process (NPAP). For the risk model with NPAP counting process we consider the joint distribution of the time to ruin and the deficit at the time of ruin. The differential equation of the ruin probability is given.

Keywords: Noncentral Pólya-Aeppli distribution, Compound distributions, Moment estimation of the parameters, Trivariate Noncentral Pólya-Aeppli distribution

References

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