On the relation between the order of claims arrival and the ruin probability in a nonhomogeneous risk process

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Abstract

Recently, Raducan et al. (2014a) obtained recursive formulas for the ruin probability of a risk process at or before claim instants under the assumptions that the claim sizes are independent, nonhomogeneous Erlang distributed, and independent of the inter-claim times (i.e., the times between two successive claims), which were assumed to be independent, identically distributed (i.i.d.), following an Erlang or a mixture of exponentials distribution. Further on, Raducan et al. (2014b) extended these formulas to the more general case when the inter-claim times are i.i.d. nonnegative random variables following an arbitrary distribution. In this work, we present several numerical examples in which we vary the distribution of the inter-claim times, which, apart the two particular distributions from Raducan et al. (2014a), is chosen of discrete and of uniform type. A comparison with similar existing formulas in the literature for the homogeneous case is discussed. Moreover, all the examples for the nonhomogeneous case support a conjecture that relates the order of the claims arrival with the magnitude of the corresponding ruin probabilities. We also present the proof of a particular case of this conjecture, when the claim sizes are nonhomogeneous exponentially distributed.

Keywords: risk process, ruin probability at or before claim instants, nonhomogeneous claim sizes, Erlang distribution, recursive methods.

References

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