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On the discounted penalty function for the generalized inverse Gaussian process

We will review, from a historical point of view, the use of Lévy processes in ruin theory. We focus on the decomposition for the ruin probability and we argue how its convolution structure is inherited from the Lévy family of processes. We will discuss the notion of discounted penalty function in the framework of Lévy risk processes. The problem of finding expressions for this function in a risk model driven by a Lévy process will be addressed. The particular example using a generalized inverse Gaussian process will be discussed. In this case, integral expressions for the discounted penalty function are available. Actual computation of ruin probabilities, distribution of the time of ruin and joint distribution of the process prior and at the moment of ruin, are carried out for a this example. Finally, forms for the discounted penalty function in more general Lévy risk models will be presented.

This is joint work with Jose Garrido (Concordia).