FINITE-TIME RUIN PROBABILITY OF RENEWAL RISK MODEL WITH DEPENDENT BY-CLAIM AND PERTURBED BY BROWNIAN MOTION

Frédéric Béré, Remi Guillaume Bagré and Vini Yves Bernadin Loyara

Abstract

This work is a contribution to the determination of the asymptotic probability of finite-time risk. We deal with a problem of risk of occurrence of a claim from the Cramer-Lundberg model in which there is some by-claim (more or less zero) and integrating a Brownian oscillation at the level of the reserve at time t given. We have considered this Brownian oscillation with a view to take into account the fluctuation of the initial reserve linked to contingencies environmental.

We evaluate the probability of ruin in finite time by considering that the laws of claims and of by-claims are respectively modeling by α-stable and β-stable distributions. We show that these laws are also of the sub-exponential family. This allows us to use related properties from asymptotic estimation to determine a closed formula, integral, of the probability of ruin in finite time, easily exploitable.

This formula will make it possible to estimate the probability of the multivariate risk by use copulas in order to account, in the most beautiful way, of the natural evolution of environmental, economic and health phenomena that we meet every day.