

The Gerber-Shiu discounted penalty functions for a perturbed risk model with two classes of claims and a constant dividend barrier strategy

Stathis Chadjiconstantinidis Apostolos Papaioannou
stch@unipi.gr papaion@unipi.gr

Department of Statistics and Insurance Science
University of Piraeus, Greece

Abstract

In this paper we consider the Gerber-Shiu expected discounted penalty functions for a risk model involving two independent classes of insurance risk perturbed by diffusion. We assume that the claim number processes are independent Poisson and generalized Erlang(n) process, respectively. Systems of integro-differential equations for the expected discounted penalty functions at ruin caused by claim and oscillation are established, respectively, and a generalized Lundberg's equation is obtained. When the generalized Lundberg's equation has distinct roots with positive real parts, explicit results for the Gerber-Shiu functions due to a claim and oscillation are given when both claim amount distributions belong to the rational family. Moreover, we consider the same two classes perturbed risk model in the presence of a constant dividend barrier strategy. Systems of integro-differential equations for the Gerber-Shiu functions due to claim and oscillation with certain boundary conditions are derived and solved for rational distributed claim amounts. Also the moments of the dividend payments until ruin are obtained. Finally, numerical examples are considered to illustrate the applicability of our main results.