Optimal proportional reinsurance for a risk model with thinning dependence

Kam Chuen Yuen

Department of Statistics and Actuarial Science,
The University of Hong Kong, Pokfulam Road, Hong Kong

Abstract

In this paper, we study the optimal proportional reinsurance problem for a book of insurance business under the thinning-dependence structure. The thinning dependence assumes that stochastic sources associated with the underlying insurance risks can be classified into different groups, and that events in each group may cause a claim with a certain probability in each insurance class of the book. Under the criterion of minimizing ruin probability, we use the martingale approach to derive explicit expressions for the optimal proportional reinsurance strategy and the corresponding minimized ruin probability in the diffusion approximation risk model. We also present some numerical examples to show the impact of the model parameters on the optimal strategies.