Lin, Xiang; Qian, Yiping; Ren, Yuhao
The excess-of-loss reinsurance strategy selection game between an insurer and a reinsurer.

Summary: In this paper we investigate the excess-of-loss reinsurance strategy selection game problem between an insurer and a reinsurer for a diffusion approximation risk model. Suppose that both the insurer and the reinsurer take the increase of expected terminal surplus utility as the conditions for purchasing the excess-of-loss reinsurance and underwriting reinsurance. By invoking the use of the dynamic programming principle and solving the corresponding Hamilton-Jacobi-Bellman equations, we obtain closed-form solutions of the excess-of-loss reinsurance selection game problems between the insurer and the reinsurer under three cases for the insurer and the reinsurer with an exponential utility function. The results show that the excess-of-loss reinsurance contract can be signed between the insurer and the reinsurer under some appropriate conditions. Finally, sensitivity analyses are also provided to illustrate how the optimal excess-of-loss strategy and the reinsurance premium and the utility profit change when some model parameters vary.

MSC:
91G05 Actuarial mathematics
91A80 Applications of game theory

Keywords:
excess-of-loss reinsurance; underwriting reinsurance; exponential utility function; Hamilton-Jacobi-Bellman equation; utility profit and loss