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Time-consistent investment and reinsurance strategies for mean-variance insurers with jumps[☆]

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Abstract

This paper studies an optimal investment and reinsurance problem incorporating jumps for mean-variance insurers within a game theoretic framework, and aims to seek the corresponding time-consistent strategies. Specially, the insurers are allowed to purchase proportional reinsurance, acquire new business and invest in a financial market, where the surplus of the insurers is assumed to follow a jump-diffusion model and the financial market consists of one risk-free asset and one risky asset whose price process is modeled by a geometric Lévy process. By solving an extended Hamilton-Jacobi-Bellman system, the closed-form expressions for the time-consistent investment and reinsurance strategies and the optimal value function are derived. Moreover, some special cases of our model and results are presented, and some numerical illustrations and sensitivity analysis for our results are provided.

Keywords: Time-consistent strategy, Investment and reinsurance, Insurer, Mean-variance criterion, Geometric Lévy process.
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