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Optimal reinsurance and investment in a Markovian regime-switching economy with delay and common shock. (Chinese. English summary) [Zbl 07494974]


Summary: This paper studies the optimal reinsurance and investment problem for an insurer in a Markovian regime-switching economy with the delayed system, in which the market modes are divided into a finite number of regimes, and all the key parameters change according to the value of different market modes. It is assumed that the insurance risk process of the insurer is modulated by a compound Poisson process while the price process of the risky asset is governed by a jump-diffusion model, and that the two jump processes are correlated through a common shock. Under the criterion of maximizing the expected mean-variance utility of terminal wealth, explicit expressions for the optimal strategies and the value function are obtained within a game theoretic framework by using the technique of stochastic control theory and the corresponding extended Hamilton-Jacobi-Bellman equation. The existence and uniqueness of the solutions are also verified. Finally, numerical examples are presented to show the impacts of some parameters on the optimal results.

MSC:
91G05 Actuarial mathematics
91G10 Portfolio theory
62P05 Applications of statistics to actuarial sciences and financial mathematics
93E20 Optimal stochastic control

Keywords:
mean-variance; reinsurance and investment; dependent risk; extended Hamilton-Jacobi-Bellman equation; Markovian regime-switching

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