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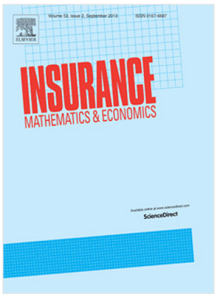


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# Portfolio optimization in a defined benefit pension plan where the risky assets are processes with constant elasticity of variance

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**Abstract**

The paper studies the optimal asset allocation problem of a defined benefit pension plan that operates in a financial market composed of risky assets whose prices are constant elasticity variance processes. The benefits paid to the participants are deterministic. The contributions to the fund are designed by a spread amortization method, which takes into account the size of the unfunded actuarial liability, defined as the difference between the actuarial liability and the fund assets. We address the case where the fund manager wishes to minimize the solvency risk at the final date of the plan when the fund is underfunded, as well as the case where the fund manager wishes to maximize an increasing, constant elasticity utility function of the fund surplus, when the fund is overfunded. The optimal portfolio and contributions are obtained in both scenarios, with the help of the Hamilton-Jacobi-Bellman equation. A numerical illustration shows the evolution of the plan for several values of the elasticity parameter of the CEV price processes and the risk aversion of the manager, yielding some tips on the main properties of the optimal portfolio.

*JEL Classification:* G22, G11, C61

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