

Optimal funding of a defined benefit pension plan

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ABSTRACT

In this paper, we address the issue of determining the optimal contribution rate of a stochastic defined benefit pension fund. The affiliate's mortality is modelled by a jump process and the benefits paid at retirement are function of the evolution of stochastic salaries. Assets of the fund are invested in cash, stocks and a rolling bond. Interest rates are driven by a Vasicek model. The objective is to minimize both the quadratic spread between the contribution rate and the normal cost, and the quadratic spread between the terminal wealth and the mathematical reserve required to cover benefits. The optimization is done under a budget constraint that guarantees the actuarial equilibrium between the current asset and future contributions and benefits. The method of resolution is based on the Cox and Huang's approach and on dynamic programming.