Stress-testing of pension fund ALM models with stochastic dominance constraints

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The main goal of a pension fund manager is sustainability. We propose an Asset and Liability Management (ALM) model structured as a multi-stage stochastic programming problem adopting a discrete scenario tree and a multi-objective function. Among other constraints, we consider the second order stochastic dominance with respect to a market portfolio. To protect the pension fund from shocks we test the inclusion of hedge financial contracts in the form of put options. Moreover, we generate contaminated scenarios to test whether the optimal composition pension fund is able to face crisis events. Numerical results show that we can efficiently manage the pension fund satisfying liquidity, return, sponsor?s extraordinary contribution and funding gap targets. We test sensitivity to put option strikes, to stochastic dominance constraints and to the level of contamination.

References

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