Utility maximization of DC pension schemes with stochastic contributions".

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Abstract

We consider an optimal investment problem for a defined contribution pension scheme in the accumulation phase by allowing for a stochastic contribution process. For instance, the contribution can be dependent on a random salary and/or may exhibit a mean-reverting property. We assume that the salary is not traded in the market, but driven by a Brownian motion which is correlated with the one driving the risky asset available on the market. We deal with the problem by maximizing the power utility of the terminal wealth of the pension beneficiary. The problem is solved via an HJB approach. In certain special situations we show that explicit solutions can be achieved. In the case of contributions modelled by a (possibly time-inhomogeneous) geometric Brownian motion, we rely on the properties of the value function to reduce the HJB equation by one dimension. We illustrate the use of numerical algorithms working in the reduced case. Finally, we discuss the asymptotics of the obtained strategies.