Valuation of Equity-Linked Insurance Using Risk Measures

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Abstract: In this talk, we consider the pricing of equity-indexed annuities using risk measures and present dynamic hedging strategies underlying these valuations. Since these products involve mortality as well as financial risks, we combine the actuarial and financial approaches to protect insurance companies against the unhedgeable mortality risk. First, risk measures are used to determine loaded premiums for equity-indexed annuities. Capital requirements are defined by applying the risk measure on the discounted future losses of the equity-linked insurance contract. Then, using the arbitrage-free theory we seek martingale mortality probabilities such that the fair value of the contract is equal to the capital requirement at time 0. Hence, given the martingale probabilities we can extract the underlying dynamic hedging strategy for the equity-linked products. However, these replicating portfolios are based on certain assumptions and produce discrete hedging errors since the underlying hedging strategies are not self-financing. Thus, the different risk measures obtained will be compared using their respective hedging errors.