

# **A Comparison of Hedging Strategies against Longevity Risk under Alternative Risk Measures**

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## **Abstract**

By incorporating the mortality nature hedging strategy of Cox and Lin (2007) and the two-factor stochastic mortality model of Cairns et al. (2006b), this paper analyze the hedging strategies against longevity risk under alternative risk measures, including ruin probability, expected shortfall, and Conditional Value at Risk (CVaR) models. We further integrate the risk premium loadings of systematic risk into the proposed model with the Sharpe ratio pricing principle, as suggested by Milevsky et al. (2006), to reflect the importance of risk-adjusted pricing. In a multiple liabilities framework, we compare the hedging results of different risk measures to those using the duration matching method and analyze which risk measure has a better distribution risk reduction effect when the mortality shifts are non-parallel and the mortality process of parameters uncertainty is included.

Keywords: mortality systematic risk, liability management, duration match, parameter risk, ruin probability, expected shortfall, Conditional VaR.

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