Natural Delta Gamma hedging of longevity
and interest rate risk

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Abstract

The paper presents closed-form Delta and Gamma hedges for annuities and death assurances, in the presence of both longevity and interest-rate risk. Longevity risk is modelled through an extension of the classical Gompertz law, while interest rate risk is modelled via an Hull-and-White process. We theoretically provide natural hedging strategies, considering also contracts written on different generations. We provide a UK-population and bond-market calibrated example. We compute longevity exposures and explicitly calculate Delta-Gamma hedges. Re-insurance is needed in order to set-up portfolios which are Delta-Gamma neutral to both longevity and interest-rate risk.

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