

Pricing and hedging of mortality-linked cash flows

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Abstract

The uncertain future development of mortality and financial markets affects every life insurer. In particular, the joint distribution of mortality and investment returns is crucial in determining capital requirements as well as in pricing and hedging of mortality-linked securities and other life insurance products. We propose simple stochastic models that are well suited for numerical analysis of mortality-linked cash flows. The models are calibrated with a data set covering six countries and 56 years. Statistical analysis supports the known dependence of old-age mortality on GDP which, in turn, is connected to many sectors of financial markets. Our models allow for a simple quantitative description of such connections. Particular attention is paid to the long-term development of mortality rates, which is an important issue in life insurance markets. Finally, some illustrative simulations are given.

Keywords: Stochastic modelling, mortality, investment returns.

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