Risk Sharing via Mortality Indexed Annuities with Biometric Guarantees

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Abstract

Retirement income, when paid out in regular installments as a life-long annuity, exposes the providers of such contracts to numerous risks. The terms of such contracts are usually fixed for a long time period and based on projections which have often proven to underestimate future longevity.

To mitigate the risks originating from systematic changes in mortality, indexed annuities, group self annuitization schemes, tontines and similar products have been studied in the literature. In these approaches, in contrast to regular annuities, longevity risk is (completely) retained by the policyholder. [1] have proposed to index annuities with a capped and floored biometric index which allows to construct products that feature a minimal and/or maximal regular payoff. This product design is of particular interest, as it closes the gap between the transfer of risk to the insurance provider and the total retention of risk by the pool of policyholders.

In the present paper we allow for systematic and unsystematic mortality risk. Pricing formulas are derived and the case when the number of annuitants tends to infinity is examined.

The sharing of risks affects the main characteristics of insurance contracts, such as price, expected payoffs, reserves, as well as the risk borne by the annuity provider. We investigate the impact of the capped/floored index from the perspectives of policyholders, annuity providers as well as regulators, illustrated by numerical examples.

Keywords: *Life Insurance, Longevity, Insurance Products, Risk Sharing, Pensions, Stochastic Mortality*

References

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