

Canonical Valuation of Mortality-linked Securities

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Abstract

A fundamental question in the study of mortality-linked securities is how to place a value on them. This is still an open question, partly because there is a lack of liquidly traded longevity indexes or securities from which we can infer the market price of risk. This paper develops a framework for pricing mortality-linked securities, on the basis of the theory of canonical valuation. This framework is largely non-parametric, helping us avoid parameter and model risk, which may be significant in other pricing methods. The framework consists of two components: (1) a method that allows us to generate an empirical distribution of future survival rates without an assumption of a stochastic process for the evolution of mortality; (2) a transformation of the real-world empirical distribution into its risk-neutral counterpart for pricing purposes. The framework is then applied to a mortality-linked security, and the results are compared against those derived from the Wang transform and some model-based methods.

Keywords: Longevity risk; Non-parametric methods; Securitization