Quickest Detection of Changes on Mortality Trend.[*]

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Abstract

The evolution of longevity is of remarkable importance to life insurance, reinsurance companies and pension funds. There are several components of risk for an insurance company: financial risks, including interest rate risk and credit risk (difficult to handle because the long-run durations), risks that longevity for the portfolio oscillates around the average trend, or shows a trend that is different from the one observed over the past historical data.

The latter is the main component of the insurance part of longevity risk, and it is hard to handle for insurance and reinsurance companies as it is complex: long-term and systemic (not diversifiable on contrary to some other insurance risks).

In this paper we construct a probabilistic proxy that a risk manager can establish to allow online detection of any deviation of the longevity trend from the current assumed trend. The optimal detection rule is assumed to be optimal with regard to an optimisation criterion and permit to sound an alarm of change in the drift as quick as it occurs.

The effectiveness of the methodology is assessed using real world data depending on the available information.

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