

An Optimal Strategy of Natural Hedging for a General Portfolio of Insurance Companies

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ABSTRACT

The mortality rate of human being has decreased year by year due to the improvement of medical and hygienic techniques. With the mortality improvement over time, life insurers may gain a profit and annuity insurers may suffer losses because of longevity risk. In this paper, we investigate the natural hedging strategy and try to find an optimal collocation of insurance products to deal with longevity risks for life insurance companies. Different from previous literatures, we use the experienced mortality rates from life insurance companies rather than population mortality rates. This experienced mortality data set includes more than 50,000,000 policies which are collected from the incidence data of the whole Taiwan life insurance companies. On the basis of the experienced mortality rates, we demonstrate that the proposed model can lead to an optimal allocation of insurance products and effectively apply the natural hedging strategy to a general portfolio for life insurance companies.

Keyword: longevity risk, natural hedging, effective duration and convexity.

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