

The Extended Logistic Model for Mortality Forecasting and the Application of Mortality-Linked Securities

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Abstract

This paper modifies the logistic model (Thatcher 1999 and Bongaarts 2005) and proposes some extended logistic mortality models. The empirical results show that the fitting and forecasting effects of the proposed mortality models are efficient for the mortality data of United State, England & Wales and Japan, especially for the modified-extended logistic (beta) model which provides the best forecasting above age 50 among these three countries. In addition, we study how to use the longevity bond to manage the longevity risk. We apply the proposed extended logistic mortality model to price the bond. For the purpose of improving the attractiveness of the bond, we design the longevity bond to be more than one tranche by taking the concept of collateral debt obligation. This design allows investors with more choices of different risk preferences.

Keywords: Mortality Model; Logistic Model; Longevity Bond; Collateral Debt Obligation

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