Longevity and life annuities reserving in Algeria: Comparaison of some mortality models

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Abstract

Our framework consists in construction of a dynamic life table for Algerian population to be used for life annuities reserving in Algeria. For this, we will use the annual life tables published by the Office of National Statistics for the period 1977-2013. The obtained mortality surfice is not complete. Some years are missing and also some life-tables were closed out earlier than the age group [80 and +[. The missing data was estimated in a previous work (FLICI, 2014). Here, we will principally compare between to two models and variants : Lee-Carter model (LC: M1, M2, M3) and Cairns-Blak-Dowd model (CBD: M5-M8). Nan, Lee and Tuljapurkar (2004) proposed a method allowing forcasting specific-age mortality pattern using inperfect historical mortality data. This method will be applied and results will be compared to those obtained with the process presented above. The quality of the mortality trend forecasting depends on the stability of the observed mortality trend. The mortality evolution in Algeria was greatly affected by the terrorism events during 90'th. The effect of this period must be corrected before forecasting. Lee (2000) demonstrated the impact of the jump-off point observed on the historical data on the forecasting qualitya. An comparison of the results obtained in the original Lee & Carter application (Lee & Carter, 1992) where the 1918 peak was taking in account, and the results obtained without jump-off years corrected (Bell, 1997), shows the advantage of the jump-off correction on the projection quality. The second element that we will deal in the present paper is the old age mortality extrapolation. The proposed models in this issues (Tchatcher, 1999. Coale & Guo, 1989; Coale & Kisker, 1990) assume that the mortality increase differently starting from the age of 80 or 85. The unavailability of old ages data for the Algerian population that reduces the applicability for these models, or in least the evaluability of the results. Starting from 2010, Algerian life tables are closed out at the age group [85 and +[. This age slice will be used to compare and evaluate the old age mortality extrapolation models. In final, results will be used for estimate mathematical reserves for a portfolio of the National Insurance Compagny (Algeria).

key-words: reserving, life annuity, longevity, old age mortality, Lee-Carter, CBD, dynamic life tables,, forecasting Algeria.

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