

# A comparative study of two-population mortality models for the assessment of basis risk in longevity hedges

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## Abstract

Longevity swaps have been one of the major success stories of pension scheme de-risking in recent years. However, with some few exceptions, all of the transactions to date have been bespoke longevity swaps based upon the mortality experience of a portfolio of named lives. In order for this market to start to meet its true potential, solutions will ultimately be needed that provide protection for all types of members, are cost effective for large and smaller schemes, are tradable, and enable access to the wider capital markets. Index-based solutions have the potential to meet this need; however, concerns remain with these solutions. In particular, the basis risk emerging from the potential mismatch between the mortality of the index reference portfolio and the pension fund/annuity book being hedged is the stand out issue that has, to date, prevented many schemes progressing their consideration of index-based solutions. Two-population stochastic mortality models offer an alternative to overcome this obstacle as they allow market participant to compare and project the mortality experience for the reference and target populations and thus assess the amount of demographic basis risk involved in an index-based longevity hedge. In this presentation, we systematically assess the suitability of several multi-population stochastic mortality models for assessing basis risks and provide guidelines on how to use these models in practical situations.

*Keywords:* Multipopulation mortality models; basis risk; mortality-linked derivatives.

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