

Hedging the longevity risk: a study of longevity basis risk in Switzerland

Ljudmila Bertschi¹ and Cheng Wan²

April 2015

Abstract

With declining interest rates across all maturities Swiss pension funds suffer from a significant exposure to longevity risks than earlier and hedging their longevity risk is becoming an increasingly important topic. The dearth of instruments available to transfer longevity risks in Switzerland is explained by inability to estimate the longevity risk exposure specific to a pension fund population or large annuity portfolios due to the lack of mortality experience records. Up to now there were no officially announced longevity swaps or index-based transactions in Switzerland. Due to the fact that the majority of Swiss pension funds are small the case for longevity risk transfer (LRT) may be relatively strong as such funds tend to have a larger longevity risk exposure as a result of undiversified idiosyncratic longevity risk. Taking into account the size of the Swiss pension market, we believe that index-based solutions could be a possibility for a pure LRT. One key issue by such transactions is the unknown basis risk which depends on the socio-economic groups represented in the pension fund. Various mortality forecast models have been created in recent years to help market participants develop a liquid longevity market. Models which help evaluate a potential pension fund specific longevity basis risk are necessary to promote development of LRT in Switzerland.

In this publication, we illustrate a procedure for Swiss medium pension funds to estimate the potential basis risk in relation to the Switzerland national population based on available information. The sensitivities to the choice of several stochastic mortality models and the length of their calibration windows are investigated. At the end we provide a case study for a hypothetical pension fund and discuss the hedge effectiveness with hedging instruments based on the total Swiss population.

Keywords: Longevity risk, basis risk, stochastic mortality model, longevity risk transfer.

JEL-Classification: C18, C22, C51, C11

¹ Dr. Ljudmila Bertschi, SAV, Swiss certified pension actuary, is a Senior Benefits Consultant at Towers Watson AG, Talstrasse 62, 8021 Zurich, Switzerland. E-mail: ljudmila.bertschi@towerswatson.com

² Cheng Wan, is a research associate in Towers Watson RAS, Youkeyuan Road 88, 430074, Wuhan, China. E-mail: cheng.wan@towerswatson.com