Title: Comparisons of hedge performances for insurance portfolios using matching strategies of size-free and size-independent mortality durations and convexities.

Authors: Cary Chi-Liang Tsai and Xinying Liang

Presenter: Cary Chi-Liang Tsai

Department of Statistics and Actuarial Science

Simon Fraser University, Burnaby, BC V5A 1S6, Canada

Tel.: 778-7827044; e-mail: cltsai@sfu.ca

Abstract:

The size-free mortality durations and convexities are respect to an instantaneously proportional change or an instantaneously parallel shift in mortality rates of some form, and implicitly assume equal proportional or parallel changes between realized and projected mortality sequences for the periods from time zero to time k, k=1, 2,…, which are not realistic. In this paper, we propose mortality durations and convexities depending on different sizes of the proportional and/or parallel changes in the force of mortality for all periods, and apply them to mortality immunization - determine the weights of a portfolio of two life insurance and annuity products for hedging mortality and longevity risks. Then we evaluate and compare VaR (Value-at-Risk) values and HE (hedge effectiveness) of the surpluses of the underlying portfolios with simulations using matching strategies of size-free and size-independent mortality durations and convexities.