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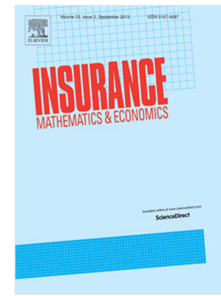
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Evaluation of Credit Value Adjustment in K-forward

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Abstract

We model and quantify counterparty credit risk for K-forward, a newly proposed longevity-linked security. We focus on the evaluation of credit value adjustment (CVA) from the longevity risk hedger's perspective. The modeling involves two folds. First, we use a vector autoregressive integrated moving-average process to model the time series of mortality indexes that is obtained by applying the original Cairns–Blake–Dowd model. Then, the risk-neutral default probability of the hedge provider is obtained by calibrating a reduced-form default model on the market price of bonds issued by the hedge provider. We calculate and compare CVA in K-forwards for different combinations of hedger provider, reference year and recovery rate.

Keywords: credit value adjustment; K-forward; longevity risk
JEL Classification: C13, C15, G22

1 Introduction

Mortality in many countries has been steadily improving for decades thanks to medical improvement and stable social environment. This trend makes longevity risk the main problem that pension funds face nowadays. A new market, the life market, has come into form over the last decade, in which mortality- and longevity-linked securities are traded (Blake *et al.*, 2013). These new products are welcomed by financial market since they could add more diversity to traditional capital market. For instance, longevity risk can be transferred to broader capital market through various securities, such as longevity bond (Blake *et al.*, 2006; Hunt and Blake, 2015), longevity swap (Cairns *et al.*, 2014), and

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