Market-Consistent Valuation of Insurance Liabilities with special emphasis on illiquidity risk premium and Insurance ALM in Japanese context

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Abstract

Solvency II QIS5 documents issued by CEIOPS recently pointed out the importance of considering the liquidity (risk) premium (hereafter LP) on market-consistent valuation of insurance liability. In this study, we adopt ALM procedure to explore whether LP works also in Japanese case in the same manner as CEIOPS indicated. First, we estimate interest rate term structure from JGB, swap rate, and corporate bond data by usual way, and point out possible difficulty arising in LP adjustment procedures described in CEIOPS(2010a) by the idiosyncrasies of Japanese interest rate. Next we compare LP estimates from the distribution of liability market-consistent value generated by Monte-Carlo simulation, estimate possible LP model for Japanese case, and evaluate surplus shortfall risk with historical/Monte-Carlo simulation.

Our aim is to make clear the problems in existing method for LP estimation and explore implications of illiquidity risk, together with interest risk and credit risk, under extreme situations.

Keywords: illiquidity risk premium, QIS5, term structure of risk-free interest rate, insurance liabilities, financial crisis, asset-liability management

1 Introduction

Solvency II QIS5 documents issued by CEIOPS(2010a) emphasized the importance of considering the (il)liquidity premium on market-consistent valuation of insurance liability.

Illiquidity premium issues have been discussed in application of discount interest rates to the calculation of market-consistent valuation of liability or embedded value disclosure. During financial crisis caused by Lehman Brothers shock, apparent liquidity dryup has taken place throughout global financial markets, prices of low-graded

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