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Parameter setting for yield curve extrapolation and the implications for hedging

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Abstract

The European Insurance and Occupational Pension Authority (EIOPA) has, in their Solvency II-framework adapted the Ultimate Forward Rate (UFR) methodology to value pension and insurance liabilities. When deriving the interest rate curve the actual market rates until a predefined Last Liquid Point (LLP) are used. Beyond this point the market is assumed to be non-liquid and a poor proxy for liability valuation. EIOPA's solution for valuing long-tailed business is to use the Smith-Wilson extrapolation towards the UFR, and synthetically deriving the rest of the interest rate curve beyond the LLP. Smith-Wilson extrapolation takes no market information into account after the LLP and has a peculiar interest rate sensitivity for shorter choice of LLP parameters. Under the Solvency II-framework, the regulator aims to build a bridge between asset and liability side of an insurance companies' balance sheets, but based on results demonstrated in this thesisthe asset managers will face practical difficulties when hedging companies' liabilities against yield curve movements. It has been disclosed that incorrect parameter setting will increase the interest rate sensitivity and force companies to become more leveraged. Finally, a sub-optimal hedge portfolio framework has been proposed which constrains the asset allocation to long positions in fixed interest rate and provide companies with a practical solution of how to mitigate their interest rate exposure under current regulation.

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