Issues with the Smith-Wilson method

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Abstract

The objective of the present paper is to analyse various features of the Smith-Wilson method used for discounting under the EU regulation Solvency II, with special attention to hedging. In particular, we show that all key rate duration hedges of liabilities beyond the Last Liquid Point will be peculiar. Moreover, we show that there is a connection between the occurrence of negative discount factors and singularities in the convergence criterion used to calibrate the model. The main tool used for analysing hedges is a novel stochastic representation of the Smith-Wilson method. Further, we provide necessary conditions needed in order to construct similar, but hedgeable, discount curves.

Keywords: Smith-Wilson, Discount curve, Yield curve, Interpolation, Extrapolation, Hedging, Totally positive matrix, Stochastic process, Solvency II.

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