

The impact of alternative extrapolation methods and assumptions in times of decreasing rates

Maarten Ruissaard
Freek Zandbergen



In our briefing note¹ earlier this year, we introduced the alternative extrapolation method as part of the 2020 review of the Solvency II regulations. As interest rates have decreased significantly since the first impact assessment (end 2018), we have analysed the impact of the different extrapolation methods in this follow-up note.

The initial impact assessment was based on FY2018 data, the first run of the holistic impact assessment on FY 2019 and the second run on HY 2020. The market interest rates were considerably different during these dates as can be seen in Figure 1.

In the initial impact assessment, the focus was on using different last liquid points (LLPs), the current 20Y and extending it to 30Y or 50Y. The impact of these assumptions is significantly different through time as visualized in Figure 2, where the market curve represents the option to extend to 50Y.

FIGURE 1: INTEREST RATE CURVES
(SOURCE: REFINITIV, EIKON AND MILLIMAN)

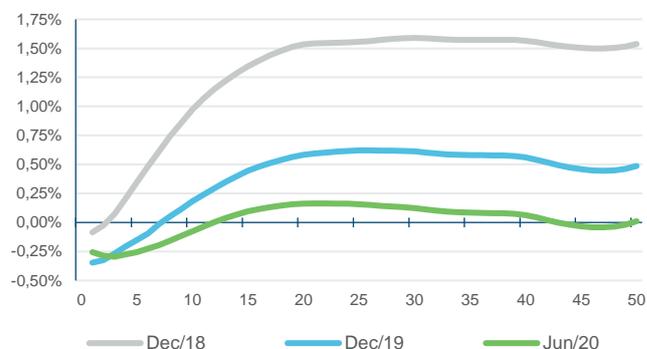
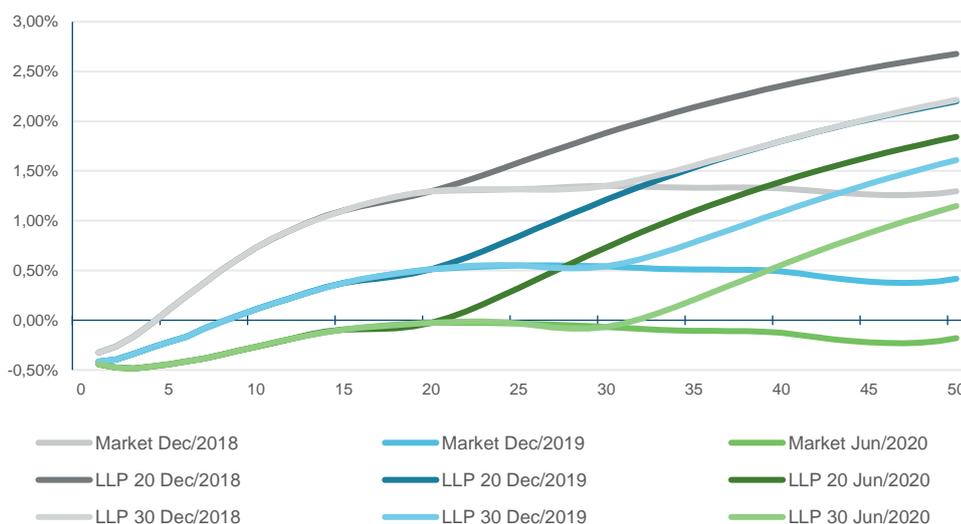


FIGURE 2: EXTRAPOLATED INTEREST RATE CURVES (SOURCE: REFINITIV, EIKON AND MILLIMAN)



¹ Please read our previous note at <https://nl.milliman.com/-/media/milliman/pdfs/articles/briefing-note-on-dynamics-of-alternative-extrapolation-method-vfd.ashx>

As it hard to conclude on the relative impact of the extrapolation assumptions, we have plotted the 50Y rate based on the different assumptions through time in Figure 3.

Note that the 50Y rate is not deemed to be part of the liquid part of the market curve. However, the rate is part of the alternative method and should be recognised accordingly.

FIGURE 3: 50Y INTEREST RATES THROUGH TIME (SOURCE: REFINITIV, EIKON AND MILLIMAN)



From Figure 3 we observe that rates have decreased significantly. The market rates went down from 1.30% to levels below zero, but also when applying extrapolation towards a UFR, the decrease is significant: from 2.70% to 1.80% for the Smith-Wilson method and from 2.50% to 1.50% when applying the alternative method.

To draw conclusions on the impact of the extrapolation assumption, we have plotted the difference between the 50Y rates in Figure 4.

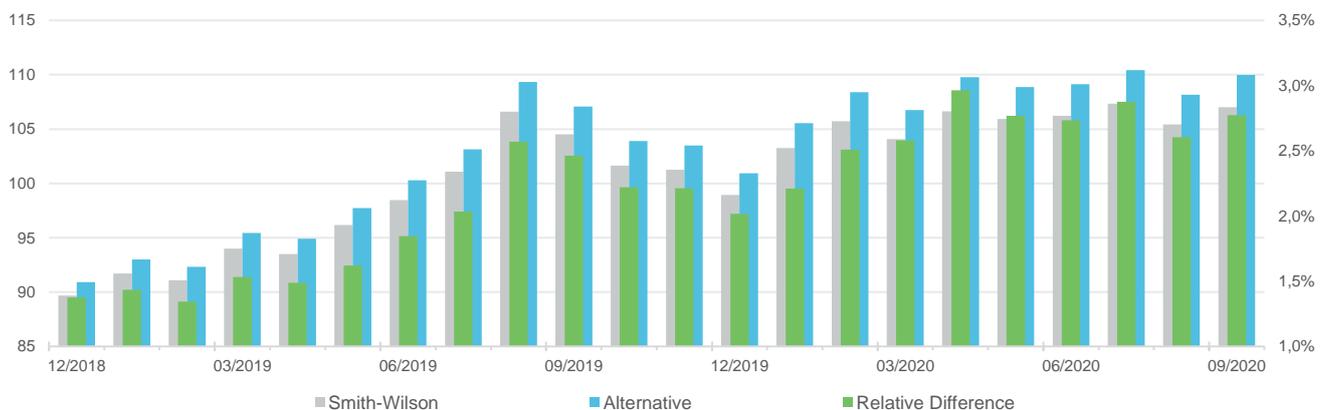
FIGURE 4: EXTRAPOLATED INTEREST RATE CURVES (SOURCE: REFINITIV, EIKON AND MILLIMAN)



From Figure 4 we clearly conclude that the “UFR balloon”, representing the impact of the current extrapolation method, has increased due to the lower interest rates (light grey dotted line). The same would have hold for the alternative extrapolation method, but significantly less severe (dark grey dotted line). Consequently, the impact of moving from the current extrapolation method to the alternative method has increased (green dotted line). The difference in the 50Y interest rate when applying the two methods increased from 20 bps in Q4 2018 to almost 38 bps in Q3 2020.

This increase in the difference can best be shown by comparing the present value of a typical Dutch insurance liability as shown in Figure 5.²

FIGURE 5: PRESENT VALUE OF TYPICAL DUTCH INSURANCE LIABILITY THROUGH TIME (LEFT-AXIS) AND THE RELATIVE DIFFERENCE BETWEEN THE TWO MAIN EXTRAPOLATION METHODS (RIGHT-AXIS)³



² A proxy cash flow, internally constructed, representing an average Dutch Life insurance company is used for the calculations. The cash flow is calibrated to represent a present value of 100 when applying the Solvency II curve including the VA at the end of 2019, with a duration of 16.

³ No VA is applied in the calculation of the present values in this analysis. The cash flow is kept constant through time and hence does not represent any run-off of liabilities, risk margin or time value of guarantees (TVOG).

First, we observe the increasing values due to the lower interest rates environment. The impacts in January are including the reduction of the UFR from 4.05% in 2018 to 3.90% in 2019 and to 3.75% in 2020. Second, we learn that the relative impact of the switch to the alternative extrapolation method has increased from approximately 1.5% at the end of 2018 to almost 3.0% during 2020.

To put things into perspective, we have made a comparison between the impact of a switch at the end of 2018, 2019 and mid-2020 in Figure 6.

A switch to the alternative method nowadays has a comparable impact as the switch to an LLP of 30Y at the end of 2018, which was deemed to be too big to absorb by certain markets (in particular the Dutch, German and Austrian markets). This comparison shows that conclusions can never be drawn on a single point in time and that scenario analyses are required to understand the impact through time in different circumstances.

The feedback⁴ from Insurance Europe is clear that the industry would like to avoid changes to the extrapolation method or its assumptions. The verdict is expected to come in December 2020 when the European Insurance and Occupational Authority is publishing its final advice to the European Commission.

FIGURE 6: IMPACT OF A SWITCH OF DIFFERENT EXTRAPOLATION ASSUMPTION OR METHODS ON THE PRESENT VALUE OF A TYPICAL DUTCH INSURANCE LIABILITY

Impact on present value of liability			
(duration between parenthesis)	Q4 2018	Q4 2019	Q2 2020
Switch to Smith-Wilson using LLP 30Y	3,6% (15,3)	5,1% (15,9)	6,8% (16,6)
Switch to Smith-Wilson using LLP 50Y	6,0% (16,6)	9,1% (18,0)	12,1% (18,8)
Switch to Alternative Method	1,4% (14,2)	2,0% (14,8)	2,8% (15,4)

⁴ Read the full feedback from Insurance Europa at <https://www.insuranceeurope.eu/key-positions-2020-review-solvency-ii>



Milliman is among the world's largest providers of actuarial and related products and services. The firm has consulting practices in life insurance and financial services, property & casualty insurance, healthcare, and employee benefits. Founded in 1947, Milliman is an independent firm with offices in major cities around the globe.

milliman.com

CONTACT

Maarten Ruissaard
maarten.ruissaard@milliman.com

Freek Zandbergen
freek.zandbergen@milliman.com