MILLIMAN BRIEFING NOTE

The alternative design of the Volatility Adjustment: Is EIOPA successful in removing the overshooting effect?

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As part of the 2020 review of the Solvency II regulations, EIOPA is considering several options to adjust the calculation of the Volatility Adjustment (VA). One of EIOPA's objectives is to remove the overshooting effect of the VA, in cases where the dampening effect of the VA exceeds the effect of a loss in the market value of fixed-income assets.

This briefing note summarises the new design and presents an impact analysis on the effectiveness of the VA under this alternative approach. What is the impact on the dynamics of the VA in times of stress?

The VA is a long-term guarantee measure that was introduced as part of the Solvency II regime. The key objectives of the VA are to prevent procyclical investment behavior, to mitigate the impact of exaggerated bond spreads on own funds and to recognize illiquidity characteristics of liabilities. Over the past few years, a series of deficiencies were identified in the current design of the VA. In this briefing note, we focus on the fact that the impact of the VA may overshoot in the case of spread widening. This overshooting effect is typically the result of differences in asset allocations between the reference portfolio and the company specific portfolio, as well as the mismatches in spread duration.

The alternative design of the VA according to EIOPA

In the consultation paper issued in October 2019, several options to adjust the VA methodology were proposed.[1] Amongst the options were changes which hinted at the use of a company specific portfolio. In the holistic impact assessment, published in March 2020, the currency reference portfolio is still the favored approach.[2] However, two important ratios are introduced to further incorporate company specific information into the calculation of the VA.

KEY CONCLUSIONS

The effectiveness of the proposed new VA is significantly reduced compared to the current design.

In Q1 2020 the Euro VA increased by 39 bps due to the COVID-19 crisis (from 7 bps to 46 bps), with the alternative design this would have been only 20 bps. This difference would have an adverse impact on the solvency ratio of Belgian and Dutch life insurance companies in the order of 10% to 40% in the first quarter of 2020.

The level of spread duration matching becomes more important as it will have a direct impact on the level of the VA as well as the effectiveness in times of stress.

The use of interest rate swaps instead of high-quality government bonds to hedge long-term interest risk can have a negative immediate impact on the Solvency II Ratio and will limit the effectiveness of the VA offset in times of stress.

Application Ratio 4 (AR4) calculates an insurer's mismatches in its fixed income assets and insurance liabilities in terms of spread duration and volume. The change is only calculated for spread driven assets, e.g. interest rate swaps are excluded.[3]

$$AR4 = \frac{PVBP(MV_{FI})}{PVBP(BEL)}, capped\ at\ 100\%$$

[1] See for more details on the consultation paper: https://www.eiopa.europa.eu/content/consultation-paper-opinion-2020-review-solvency-ii_en

[2] See EIOPA's publications on the holistic impact assessment for more background and details around the different formulas and assumptions: https://www.eiopa.europa.eu/solvency-ii-review-information-request-national-supervisory-authorities_en

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Application Ratio 5 (AR5) accounts for the illiquidity characteristics of insurance liabilities in terms of surrender and mortality risk

$$AR5 = \frac{BEL_1 \cdot AR5_1 + BEL_2 \cdot AR5_2 + BEL_3 \cdot AR5_3}{BEL_1 + BEL_2 + BEL_3}, floored\ at\ 60\%, capped\ at\ 100\%$$

Where the three illiquidity categories are defined with the following criteria and resulting application ratio.

ILLIQUIDITY CATEGORY	CRITERIA	AR5i
1 – High	No surrender options or where the take up of the surrender option can never lead to a loss in own funds for the insurer. Low best estimate impact mortality risk.	100%
2 – Medium	Low best estimate impact of permanent increase in lapse rates. Low best estimate impact of mortality risk.	75%
3 – Low	All other products	60%

These two new ratios, in combination with the General Application Ratio (GAR, which is set at 85%), replace the '65% application ratio in the current design. Depending on the company's asset-liability management (ALM) and the characteristics of the liabilities, the new application ratios can have positive or negative one-off impact on the level of the VA.

Finally, there is a new scaling factor which corrects for the other assets in the reference portfolio:

$$Scale_c = \frac{1}{weight_{Gov} + weight_{Corp}}, the\ result\ will\ be\ a\ number \geq 100\%$$

For the EUR currency this results currently in a scaling factor equal to 141%.

Combining the different elements, the new VA formula looks like:

$$VA = GAR \cdot AR4 \cdot AR5 \cdot Scale_C \cdot RC\_S_C$$

EIOPA has also proposed an amendment to the calculation of the risk correction (RC, or fundamental spread). In the current design, the risk correction is based on long-term average spread (LTAS) and the probability of default (PD) of assets and is consequently stable through time. In the alternative design the risk correction is dependent both on the LTAS and on the current level of the spread (S) and will move through time.

$$RC_{Gov} = 30\% \cdot \min(S^+, LTAS^+) + 20\% \cdot \max(S^+ - LTAS^+, 0)$$

$$RC_{Corp} = 50\% \cdot \min(S^+, LTAS^+) + 40\% \cdot \max(S^+ - LTAS^+, 0)$$

Superscript $^+$ denotes the maximum of the number and zero

Note that in the current design the risk correction is 30% of the LTAS for governments in EEA member states and 35% of the maximum of LTAS and PD for all other assets. In practice the formula implies that the RC is strongly related to the current spread levels.

When S is higher than LTAS:	*RC increases with 20% of delta S for government bonds and 40% of delta S for corporate bonds*
When S is lower than LTAS:	*RC increases with 30% of delta S for government bonds and 50% of delta S for corporate bonds*

In the next section we present an estimated impact of this design change on the level of the VA in times of spread widening.

The impact on the dynamics of the VA

The table below gives an illustrative example for government and corporate bonds of the VA calculations in the current and alternative design.

FIGURE 1: ILLUSTRATIVE EXAMPLE FOR GOVERNMENT AND CORPORATE BONDS OF THE VA CALCULATIONS IN THE CURRENT AND ALTERNATIVE DESIGN

		GOVERNMENT		CORPORATE	
		CURRENT	ALTERNATIVE	CURRENT	ALTERNATIVE
Δ Spread	*Δ S+*	50	50	50	50
Δ Long Term Average Spread	*Δ LTAS*	0	0	0	0
Δ Risk Correction	*Δ RC*	0	10	0	20
Δ Risk Corrected Spread	*Δ RC_S*	50	40	50	30
General Application Ratio	*GAR*	65%	85%	65%	85%
Spread Duration Matching	*AR4*		55%		55%
Liability Characteristics	*AR5*		75%		75%
Portfolio Scaling	*Scale*		141%		141%
Δ Volatility Adjustment	*Δ VA*	33	20	33	15
Δ Spread	*Δ S+*	50	50	50	50
Effectiveness		65%	40%	65%	30%

The relatively low AR4 is the result of the fact that we assume a 95% interest rate duration matching, of which 40% is done with interest rate swaps (IRS). The fact that IRSs have no spread duration implies that the VA is lower and that the effectiveness decreases in times of spread movements. For AR5 we have applied an average portfolio of 20% Category I, 50% Category II and 30% Category III.

The main finding is that the effectiveness of the VA in times of spread widening is strongly reduced in the alternative design, from 65% to 40% for government bonds and from 65% to 30% for corporate bonds. If we increase AR4 (the ALM related metric) to 90%, the effectiveness for government bonds increases to the current level of 65%, but the effectiveness of corporates remains below the current figures at only 49%. In the remainder of this briefing note, we continue with the assumptions of AR4 and AR5 set at 55% and 75% respectively.

Real world examples

In addition to the stylized example in the previous section, we can look at the difference in dynamics between the current and proposed alternative design on the total VA. We have analyzed a general spread widening, as well as the impact of the Global Financial Crisis (2008-2009) and the COVID-19 crisis (2020Q1). In the table you can observe that the dampening effect of the VA under the alternative design is significantly lower than the current design. In a regular spread widening scenario of 50 basis points on all asset classes, the reduced impact of the VA is 11 basis points. In times of crisis this impact would be 20 basis points in Q1 2020 and up to 46 basis points when looking back at the markets during the Global Financial Crisis in 2008.[4,5]

FIGURE 2: DELTA VA (IN BPS)

SCENARIO	CURRENT DESIGN	ALTERNATIVE DESIGN	DIFFERENCE
+ 50 bps	+ 23	+ 12	- 11
GFC 2008	+ 82	+ 36	- 46
COVID-19	+ 39	+ 19	- 20

Impact on solvency ratios

By using the information from the previous section, we can translate the difference in offsetting effect of the VA into an impact on the Solvency II Ratios of insurance companies. As a proxy, we have investigated the sensitivity to the VA of several companies in the Benelux region. For the Netherlands in particular, where insurers typically have long dated liabilities, the VA has a significant impact on the Solvency II Ratio. In Luxembourg where the businesses are predominantly Unit-Linked, the impact is less severe.

In the following table we estimate the adverse impact of a 20 basis points reduction in VA, as estimated in the previous section, on the Solvency II Ratio of several of the local life insurance companies. For simplicity, we have ignored the different starting position and potential change in sensitivities from the introduction of a revised Solvency II framework.

FIGURE 2: ESTIMATED IMPACT OF THE ALTERNATIVE DESIGN DURING THE COVID-19 CRISIS (-20 BPS VA)

COUNTRY	COMPANY	DIFFERENCE IN SOLVENCY II RATIO
Belgium	AG	-20%
	Baloise	-20%
	Belfius	-14%
	KBC	-12%
	P&V	-26%
The Netherlands	Achmea	-26%
	Aegon	-34%
	asr	-26%
	NN	-40%
	Vivat	-38%
Luxembourg	Cardif Vie	-6%
	La Mondiale	-8%

* Based on 2018 SFCR of the local life companies, sensitivity caused by eligible own funds reduction only.

For the Dutch and Belgian markets, it could imply a 10% to 40% drop (or reduced increase) in the Solvency II ratio in the current situation of COVID-19.

[4] For the GFC 2008 scenario, we used annual change in the difference between swap rates and ECB yields averaged over all maturities for the government spread; similarly, we used an annual delta of market spreads averaged over all maturities per issuer for the corporate bond spreads.

[5] For the COVID-19 scenario, we used the observed deltas in the first quarter of 2020.

Conclusions

In the previous section we have observed that the change in methodology could lead to a significant drop in Solvency II Ratios in volatile markets compared to the current methodology. This is in line with EIOPA's ambition to reduce the overshooting effects, which effectively means reducing the dampening effect of the VA, such that it no longer exceeds the effect of a loss in the market value of fixed-income assets.

Given that there are very limited disclosures in Q1 2020 and that the VA effect is usually not disclosed in isolation, it is hard to conclude whether EIOPA has succeeded or not – or if they have overshot in their correction. It is up to the insurance companies to understand the dynamics of the alternative design at an early stage. Not only to manage expectations in disclosures, but also when reviewing investment strategies and executing strategic asset allocation (SAA) studies. Under this new design companies will have to pay increased attention to spread duration matching in order to gain the full benefit of the VA, following the direct link between the level of the VA and the effectiveness over time.

The fact that the use of interest rate swaps will have a negative immediate impact on the Solvency II Ratio and will limit the offset in times of stress compared to high-quality government bonds is something that all insurers need to understand and bear in mind.

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