

## ACTUARIAL ASSOCIATION OF EUROPE SOLVENCY II PROJECT

### FOCUS ON THE VOLATILITY ADJUSTMENT IN THE S2 2020 CONTEXT

September 2020

#### Context

The Volatility Adjustment (VA) plays a central role in the stabilisation of Own Funds when fixed income markets are under stress due to widening credit-spreads. This component is part of the Solvency II 2020 review and is subject to the holistic impact assessment (HIA) including the complementary information request of June 2020, which reflects the COVID-19 crisis situation.

There is now consideration of whether to establish a clearer split between a “permanent component” of the adjustment and a “macroeconomic component” that exists only in times of widened credit-spreads.

The AAE is pleased to take this opportunity to analyse and comment on the desirable properties of the VA for the different stakeholders and how to best ensure appropriate risk management and communication.

#### General components of the permanent VA

As part of the assessment, EIOPA has proposed the following formula for the general components of the VA:

$$VA = GAR \cdot AR4 \cdot AR5 \cdot Scale_c \cdot RC_{S_c}$$

EIOPA has proposed the following approach for each component (see Appendix for further detail):

- **General Application Ratio (GAR)** from 65% (current regulation) to 85% (HIA)
- **Application Ratio 4 (AR4)** – fixed income and duration mismatch inferred from the ratio of basis point sensitivities between fixed income assets and best estimate liabilities
- **Application Ratio 5 (AR5)** – liquidity of liabilities based on qualitative criteria:
  - 100% if policies are not lapsable
  - 75% for policies with limited lapse and mortality
  - 60% for other policies
- **Scaling factor ( $Scale_c$ )** – gross up factor to reflect the liquidity premium of other assets than the ones in the representative portfolio further corrected by AR4
- **Risk Corrected Spread ( $RC_{S_c}$ )**, based on representative portfolio for currency  $c$ <sup>1</sup>

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<sup>1</sup> E.g. EIOPA representative portfolio for the Eurozone.

Risk correction based on a combination of current spread and Long-Term Average Spread (LTAS) rather than LTAS only (current regulation)  
 Subtract for expected risk (government)  $30\% * (\text{Spread} < \text{LTAS}) + 20\% * (\text{Spread} > \text{LTAS})$   
 Subtract for expected risk (corporates)  $50\% * (\text{Spread} < \text{LTAS}) + 40\% * (\text{Spread} > \text{LTAS})$

### Considered approaches for the macroeconomic VA

We note a difference in approach between

- the HIA, where the macroeconomic VA would be calculated immediately at country level, based on excessive spreads and acts as a maximum when triggered; versus
- the complementary information of June where the macroeconomic VA is the country VA with lower trigger and smoothed mechanism acting as an additive component<sup>2</sup>.

### Main objectives, deficiencies and possible solutions

We can identify 5 main objectives in designing the VA:

1. Prevent procyclical investment behavior
2. Mitigate the impact of exaggerations of bond spreads on Own Funds
3. Reflect of the heightened risk of defaults observed during a crisis
4. Capture the relevant investment horizon in the risk correction
5. Ensure simplicity of the VA calculation

The main deficiencies include:

Deficiency	Comments	Possible solutions
Over- or undershooting effect of the VA	<p>The over-shooting/under-shooting effect occurs when the dampening effect of the VA is higher/lower than the losses on the assets. This is an important deficiency that has actually been exacerbated during the COVID-19 crisis.</p> <p>The conditions to have a perfect match would be the following:</p> <ul style="list-style-type: none"> <li>– No basis-risk with the EU representative portfolio, so undertaking specific portfolio (eventually incl. assets that show similar spread sensitivities such as Private Equity or Direct Property)</li> <li>– No basis-risk with risk-correction spread calibrations as is currently</li> </ul>	<p>The main contributor to the over-/under-shooting effect is the use of the EU representative portfolio. Moreover, the EU portfolio composition is updated only on a yearly basis, resulting in a time-lag while extra asset movements are naturally observed in times of crisis due to market volatility.</p> <p>The use of Own Assets Weights or “Undertaking Specific VA” is technically the best solution, only if</p> <ul style="list-style-type: none"> <li>(i) the effectiveness of the VA is sufficient enough;</li> <li>(ii) this represents all the assets of an insurer in an appropriate way<sup>3</sup>.</li> </ul> <p>Allowing for the Undertaking Specific VA in Pillar I calculations has sparked</p>

<sup>2</sup> See appendix for a detailed comparison between the two approaches.

<sup>3</sup> Some discussions took place w.r.t. Dutch mortgages in order to better reflect their characteristics (not a mapping to corporate bonds). The mortgage market appears however to be quite heterogeneous across Member States given the specific regulations in place and existing options.

Deficiency	Comments	Possible solutions
	<p>the case for some asset classes (e.g. government bonds and mortgages)</p> <ul style="list-style-type: none"> <li>– No Application ratio similar to the matching adjustment</li> <li>– A stable risk correction factor or limited risk correction so that the full asset spread movement can be recognized in the VA</li> </ul>	<p>many reactions given the potential introduction of capital charges on government bonds, the lack of comparability among insurers<sup>4</sup> and the lack of safeguards against wrong investment incentives. The risk of not considering the own VA properly is that undertakings start hedging this basis risk and reproduce the EU portfolio, leading to herd behaviour and additional systemic risk. The entity specific VA should at least be part of the ORSA exercise in case of significant deviation with the underlying assumptions of the standard formula.</p> <p><b>We therefore believe that an Own VA, with appropriate safeguards, should optionally coexist with the EU VA by communicating the ratio with Own VA to the supervisor next to the ratios with the EU VA.</b></p>
Application of VA does not take into account illiquidity characteristics of liabilities	While a higher proportion of the VA should be recognized for illiquid liabilities, the “illiquid characteristic” remains difficult to define. Two approaches were considered in the CP on the S2 2020 review: analysis of illiquid share based on stressed CF or bucketing according to specific criteria.	<b>Determining the share of illiquid liabilities under stressed scenarios has the advantage of being objective and should be part of the liquidity risk management process.</b> As a response to COVID-19, we also note that supervisors have recently requested more reporting on liquidity and EIOPA has been encouraged by the European Systemic Risk Board to further develop a liquidity monitoring framework. The purpose would be to leverage as much as possible on this framework and to perform this calculation on a yearly basis, or more frequently only in exceptional circumstances.
Misestimation of risk correction	The risk correction aims at isolating the expected credit loss component of the spread to infer the liquidity premium or the risk-corrected spread that can actually contribute to the VA given the long-term nature and illiquidity of insurance liabilities. Three risk-correction approaches have	<b>Defining the risk-correction as a combination of “Point In time” and “Through The Cycle” approach for the excessive part</b> helps to maintain the countercyclical potential of the VA while considering current markets. However, it does require the

<sup>4</sup> We note that the lack of comparability will become a fact given the introduction of AR4 and AR5.

Deficiency	Comments	Possible solutions
	<p>been considered so far:</p> <ul style="list-style-type: none"> <li>– Long-term average spread (LTAS) based on 30 year historical data that is through the cycle (TTC) and very stable over time. This current approach is perceived as being too stable and not market consistent enough as a fixed amount calibrated over a long-time horizon is deducted from the market spread at calculation date</li> <li>– Relative risk correction calibrated as a fixed percentage of the spread which has the merit of being Point In Time (PIT) and more market consistent, but reduces significantly the countercyclicality of the VA</li> <li>– A combination of PIT under relatively low spread levels where a TTC component is added when spreads exceed a specific threshold. This approach is currently tested in the holistic impact assessment</li> </ul>	<p>estimation of a number of additional parameters, which could lead to challenges given the scarcity of representative crisis-time liquidity spread data.</p>
Cliff effect of country specific increase	<p>When the country specific VA is triggered because of increased risk correction spread of one specific country compared to the EU zone, there is a “cliff effect” because of the discontinuity in the underlying calculation. This can be tempered by some smoothing mechanism as currently tested in the holistic impact assessment.</p>	<p>We welcome such a smoothing mechanism to stabilize the SII ratio over time due the changes in underlying portfolio. While the country VA reduces the basis risk, there is still some basis risk for the smaller players in one country given their limited contribution to the country representative portfolio.</p> <p><b>In addition to the quicker activation of the smoothed country-specific VA in times of financial crisis under the macro-economic VA, we believe that an additional VA correction should be considered in a stepwise mechanism<sup>5</sup> under exceptional crisis situations,</b> namely where all indicators (not only spread) are stressed and volatile as we are still experiencing with COVID-19. The</p>

<sup>5</sup> Without having a clear view at this stage, a similar yearly variation as applicable under the UFR (e.g. max 15bp annual variation) could be introduced to stabilize VA evolution.

Deficiency	Comments	Possible solutions
		<p>calculation based on whole country spread (see method 2 of option 8) has the merit of recognizing that excess spread in those circumstances is not only due to increased default risk but also to a shock on the economy as a whole. Working at country level is appropriate when looking at the recent Covid-19 crisis as every EU member was facing a specific situation in terms of propagation rate, testing and hospital capacity resulting in country specific measures with different impacts on the economy. Comparing options 7 and 8 as part of the complementary information would give interesting insights.</p> <p><b>The additional stepwise macro-economic VA on top of the activated country VA could be considered for both the EU VA and Own VA after EIOPA and local supervisor approvals with appropriate Solvency, Financial and Liquidity safeguards. This should be calibrated consistently with the country VA.</b></p>
Underlying assumptions of VA unclear	<p>It is not always clear whether the VA represents a “compensation for exaggerations in bond spread” or “an additional illiquidity premium on assets that replicate the liabilities”.</p> <p>Next to the definition of the essence of the VA, the interaction between the different application ratios (general, ALM mismatch, illiquidity, scaling factor) do not ensure there is no GAP or overlap or ensure global consistency of the VA framework.</p>	<p>It is essential from a risk management perspective to have a thorough understanding of the VA calibration before communicating properly to the stakeholders and contributing to financial stability. While some margin can be built into the VA framework, we encourage EIOPA to provide all relevant information to allow undertakings to contribute to the financial stability while protecting policyholders.</p>

### Key takeaways

We believe that the undertaking specific VA can coexist with the EU VA by communicating the resulting ratio to the supervisor at each reporting date and should at least be covered in the ORSA exercise.

We support the definition of the risk correction spread as a combination of “Point-in-Time” approach supplemented by a “through-the-Cycle” approach in times of excessive spreads as it allows for both market-consistency and countercyclicality.

In the case of the EU VA, the quicker activation of the smoothed country VA following heightened spreads in one specific country has the merit of stabilizing the SII ratio over time due to the temporary change in underlying representative portfolio (country versus EU). We welcome the qualification of country VA as macroeconomic VA in the complementary information request.

In exceptional circumstances, as experienced during COVID-19 crisis, the permanent VA plus activated country VA should be completed by a stepwise additional macro-economic VA recognizing the extraordinary shock on the economy at country level. This additional macro-economic VA should only exist at EIOPA initiative and after local supervisor approvals based on Solvency, Financial and Liquidity safeguards.

Finally, we recommend EIOPA should give as much information as possible on the underlying assumptions of the VA to allow undertakings to contribute to financial stability while managing their solvency and financial positions.

## References

1. EIOPA (2019), "Consultation Paper on the Opinion on the 2020 review of Solvency II", 2.4 *Volatility Adjustment*, [https://www.eiopa.europa.eu/content/consultation-paper-opinion-2020-review-solvency-ii\\_en](https://www.eiopa.europa.eu/content/consultation-paper-opinion-2020-review-solvency-ii_en)
2. EIOPA (2020), "Technical Specification of the information request on the 2020 review of Solvency II – Holistic Impact assessment", 5.1.2. Volatility Adjustment, [https://www.eiopa.europa.eu/solvency-ii-review-information-request-national-supervisory-authorities\\_en](https://www.eiopa.europa.eu/solvency-ii-review-information-request-national-supervisory-authorities_en)
3. EIOPA (2020), "Technical specification of the complementary information request on the 2020 review of Solvency II", [https://www.eiopa.europa.eu/browse/solvency-ii/2020-solvency-ii-review/complementary-information-request-holistic-impact\\_en](https://www.eiopa.europa.eu/browse/solvency-ii/2020-solvency-ii-review/complementary-information-request-holistic-impact_en)
4. de Leval D., Garston G. & R. Meli (2020), "Reviewing the fundamentals of the volatility adjustment- The risk-correction under the loop", <https://www.linkedin.com/pulse/reviewing-fundamentals-volatility-adjustment-daphn%25C3%25A9-de-leval/?trackingId=gAfTLhGaemi00%2FMuVB7Jvw%3D%3D>
5. Loon, V., Frank, P. (2017). "Empirical studies in corporate credit modelling : liquidity premia", factor portfolios & model uncertainty.

## APPENDIX

### Evolution of the permanent VA

Below table gives an overview of the different components of the permanent VA as considered under the Holistic Impact Assessment versus current regulation:

Component	Definition	New formula: $VA = GAR \cdot AR4 \cdot AR5 \cdot Scale_c \cdot RC\_Sc$	Curent formula: $VA = GAR \cdot RC\_Sc$
General Application Ratio (GAR)	While the exact calibration remains unclear, the purpose of the GAR is to account for the remaining mismatch between assets and liabilities in case liabilities are not fully replicated by assets	85%	65%
Application Ratio 4 (AR4)	Fixed income and duration mismatch inferred from the ratio of basis point sensitivities between fixed income assets and best estimate liabilities	Undertaking specific: $AR4 = \min\{(PVB(P(MV_{i,c}^{FI}) / PVB(P(BEL_{i,c}))), 1\}^6$	N.A.
Application Ratio 5 (AR5)	Ratio depending on the liquidity of liabilities based on qualitative criteria	Undertaking specific: $AR5 = \max(\min(\frac{BEI \cdot AR5, I + BEII \cdot AR5, II + BEIII \cdot AR5, III}{BEI + BEII + BEIII}; 100\%); 60\%)$ <ul style="list-style-type: none"> <li>•100% if policies are not lapsable (AR5,I)</li> <li>•75% for policies with limited lapse and mortality (AR5,II)</li> <li>•60% for other policies (AR5,III)</li> </ul>	N.A.
Scaling factor ( $Scale_c$ )	Gross up factor to reflect the liquidity premium of other assets than the ones in the representative portfolio for currency $c^7$ further corrected by AR4 <sup>8</sup>	Currency specific: $Scale_c = 1 / (W_{gov,c} + W_{corp,c})$ <ul style="list-style-type: none"> <li>•<math>W_{gov,c}</math> : weight of government bond portfolio in the representative portfolio for currency <math>c</math>;</li> </ul>	N.A.

<sup>6</sup>  $MV_{i,c}^{FI}$  = the market value of undertaking's  $i$  investment in fixed income investments in currency  $c$  (fixed income investments identified on basis of their CIC)

$PVB(P(MV_{i,c}^{FI})) = \frac{MV_{i,c}^{FI}(CS) - MV_{i,c}^{FI}(CS + GAR \cdot Scale_c \cdot RC\_Sc)}{GAR \cdot Scale_c \cdot RC\_Sc}$  as proxy for assets duration inferred from the price value of a basis point of the fixed income investments of undertaking  $i$  in currency  $c$ .

$PVB(P(BEL_{i,c})) = \frac{(BEL_{i,c}(RFRc) - BEL_{i,c}(RFRc + GAR \cdot Scale_c \cdot RC\_Sc))}{GAR \cdot Scale_c \cdot RC\_Sc}$  as proxy for liabilities duration inferred from the price value of a basis point of the best estimate of the liabilities of undertaking  $i$  in currency  $c$

<sup>7</sup> E.g. EIOPA representative portfolio for the Eurozone.

<sup>8</sup> This factor was introduced during the complementary information request of June 2020.



Component	Definition	New formula: $VA = GAR \cdot AR_4 \cdot AR_5 \cdot Scale_c \cdot RC\_Sc$	Curent formula: $VA = GAR \cdot RC\_Sc$
		<ul style="list-style-type: none"> <li>• <math>W_{corp,c}</math> : weight of corporate bond portfolio in the representative portfolio for currency c</li> </ul>	
Risk correction spread ( $RC\_Sc$ )	Result after subtracting from the full spread the part that is not related to expected credit risk (Risk Correction -RC) and that contributes to the VA. Risk correction can based either based on a combination of current spread and Long-Term Average Spread (LTAS) rather than LTAS only (current regulation)	<ul style="list-style-type: none"> <li>• <math>RC\_Gov = 30\% \cdot (\text{Spread} &lt; LTAS\_G) + 20\% \cdot (\text{Spread} &gt; LTAS\_G)</math></li> <li>• <math>RC\_Corp = 50\% \cdot (\text{Spread} &lt; LTAS\_C) + 40\% \cdot (\text{Spread} &gt; LTAS\_C)</math></li> </ul>	<ul style="list-style-type: none"> <li>• <math>RC\_Gov = 30\% \cdot (\text{Spread} &lt; LTAS)</math></li> <li>• <math>RC\_Corp = \max(35\% \cdot LTAS\_C, PD + CoD)</math></li> </ul> <p>Where PD &amp; CoD represent the Probability of Default and Cost of Downgrading<sup>9</sup></p>

## Evolution of the macroeconomic VA

### Approach used in the complementary information<sup>10</sup>

The total VA applicable for an undertaking i located in country j is:

$$VA_{perm}^i + VA_{macro,j}^i$$

The macro-economic VA is an additive component to the permanent VA, which depends on the level of the risk corrected (RC) spread in each country j, relatively to the currency RC spread:

$$VA_{macro,j}^i = GAR \cdot AR_4 \cdot AR_5 \cdot \omega_j \cdot \max(RC\_Sc,j \cdot Scalec,j - 1.3 \cdot RC\_Sc \cdot Scalec; 0)$$

where

- $Scalec,j$  denotes the scaling-factor for country j using currency c;
- $RC\_Sc,j$  denotes the risk-corrected spread of the reference portfolio for country j using currency c;
- $\omega_j$  is a component designed to ensure a gradual and smooth activation of the country component and mitigating the cliff effect ( $\omega_j = 0$  if  $RC\_Sc,j \leq 60$  bp;  $(RC\_Sc,j - 60)/30$  if  $60$  bp  $< RC\_Sc,j \leq 90$  bp;  $1$  if  $RC\_Sc,j > 90$  bp)

### Approach used in the Holistic Impact Assessment

In case the permanent VA is calculated based on the EU representative portfolio rather than undertaking specific portfolio (approach 1 of the HIA), the macro-economic VA can be considered.

<sup>9</sup> In most cases, the first term based on 30 year Long-Term Average Spreads would be higher and be retained for the risk-correction factor.

<sup>10</sup> See para 61 of the Technical specification of the complementary information request.



The maximum between the permanent VA and macro-economic VA defines the final VA for undertaking I in currency c provided the macro-economic VA is triggered:

$$VA_{i,c} = \max(VA_{i,c}^{perm}; VA_{i,c}^{macro}) \text{ in case } VA_{i,c}^{macro} \text{ is triggered}$$

The macro-economic VA is defined as:

$$VA_{i,c}^{macro} = GAR * AR_{i,c}^{macro} * \max(S_{JURi} - \bar{S}_{JURi}^{60} - \text{corridor}; 0)$$

where

- $AR_{i,c}^{macro}$  is an application ratio for the liabilities of undertaking I in currency c which is set to 1;
- $S_{JURi}$  is the country spread for the jurisdiction/country of undertaking i;
- $\bar{S}_{JURi}^{60}$  is the average spread over the last 60 months for the jurisdiction of undertaking i;
- Corridor is the corridor by which the risk-corrected country should exceed its average before the macro-economic VA is activated, set at 20 bp.