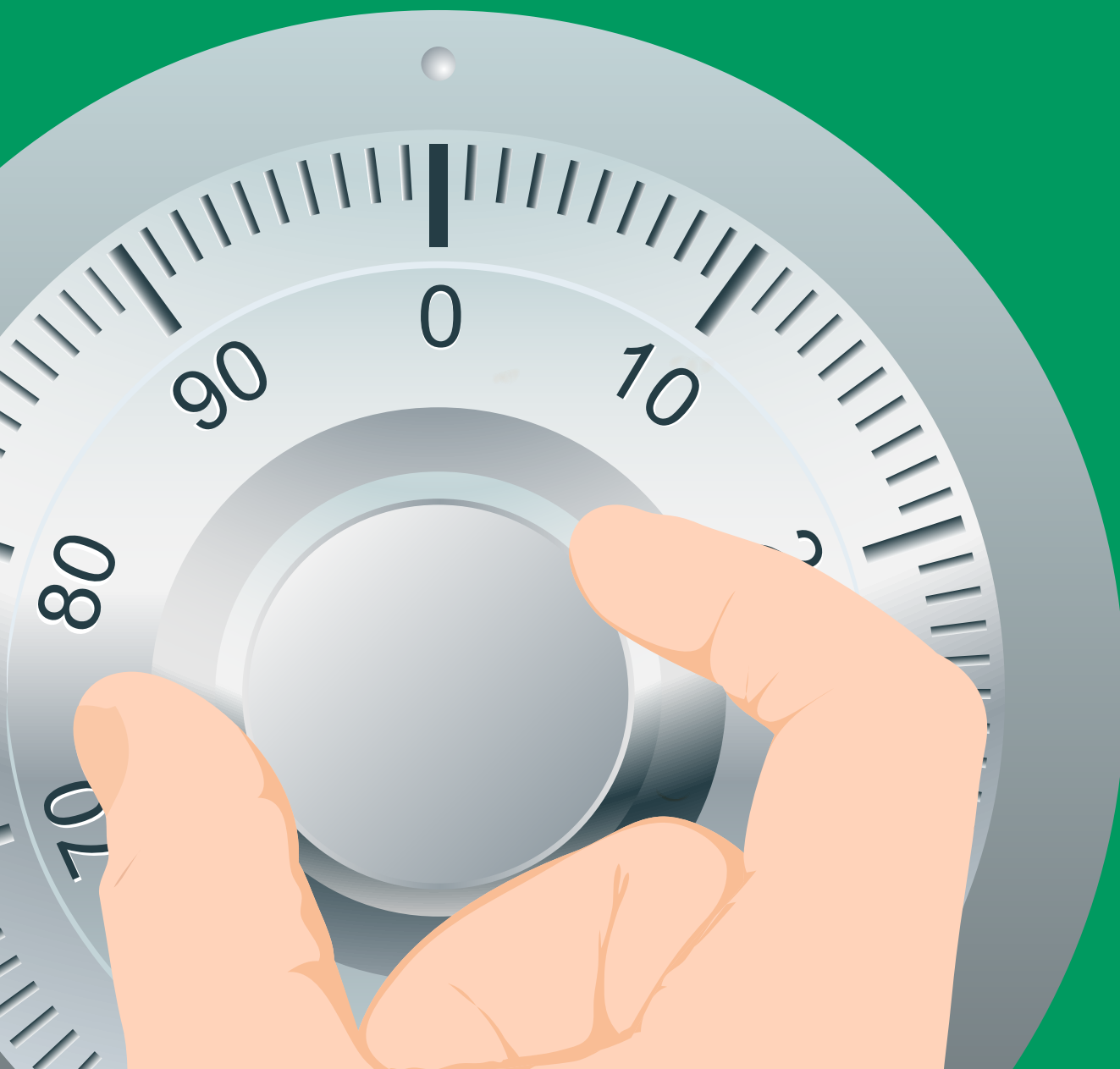


For professional investors - March 2022

SOLVENCY II: ADJUSTING THE DIAL, BUT NO REVOLUTION



BNP PARIBAS
ASSET MANAGEMENT

The sustainable
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INTRODUCTION

A SET OF NEW RULES TO STRENGTHEN THE ROBUSTNESS OF THE INSURANCE SECTOR

In 2019, the European Commission (EC) asked EIOPA (the European Insurance and Occupational Pensions Authority) to review the Solvency II regulation. Introduced in 2016, this created a harmonised prudential framework for insurance firms. It replaced a patchwork of rules in the areas of life insurance, non-life insurance and reinsurance.

EIOPA's review was to take into account the lessons learned during the first years of the regulation's application, the aim being to continue to ensure the insurance sector's robustness and resilience. In particular, the review* aims to:

- Provide incentives for insurers to contribute to the long-term sustainable financing of the economy
- Improve risk-sensitivity and mitigate excessive short-term volatility in insurers' solvency positions
- Improve proportionality and enhance quality, consistency and coordination of insurance supervision across the EU, and improve the protection of policyholders and beneficiaries, including when their insurer fails
- Better address the potential build-up of systemic risk in the insurance sector and improve preparedness for extreme scenarios that may make recovery or the resolution of a failing insurer or reinsurer necessary.

In response, after consulting with the insurance industry, EIOPA put a number of proposals to the EC in December 2020. Last September, the EC issued its final proposed wording, based essentially on EIOPA's recommendations. This new text now awaits approval by the European Parliament and Council and could yet be modified as a result of the negotiations. Final passage into local law is therefore not expected before 2024.

The EC proposal does not revolutionise Solvency II; rather, it introduces a number of amendments. In our view, eight of these are particularly important. We detail our reasoning in this document. We address this paper primarily to practitioners in the insurance industry. The amendments have the following objectives:

- To better align Solvency II with:
 - The market reality (low return environment and its associated risks): Amendments 1, 2 and 5
 - Insurers' long-term investment horizon and their significant role as contributors to the economy: Amendments 4 and 7
 - Some specificities linked to each insurer: Amendment 3
- To reduce sensitivity to market fluctuations: Amendment 6
- To better take into account certain risks, such as those linked to climate change: Amendment 8.

The aim of the Solvency II review is certainly not to undermine the insurance industry's solvency position, which is reasonably strong and has weathered the Covid-19 crisis well. Globally, the EC expects the proposed measures to free up EUR 90 billion of capital in the short term. Nevertheless, as some of the measures – such as amendments 1 and 2 concerning the discount curve and interest-rate shocks – will engender an increase in insurers' capital requirements, the actual amount of freed capital will be reduced to EUR 30 billion over the long term, as the measures will be applied over a transition period.

*Source: [Risk management and supervision of insurance companies \(Solvency 2\)](#) | European Commission (europa.eu)

SUMMARY OF THE PROPOSED NEW MEASURES

Adjustment type	Impact on the free capital of the industry	Other comments
1 Modification of the discount curve: Discount curve moves down	↓	Increase of the value of the liabilities and change of the liability sensitivities
2 Change relating to interest-rate shocks: more symmetry between downward and upward shocks	↓	Increase of the SCR mainly on downward shocks, and for insurers with a large duration mismatch between assets and liabilities
3 New approach to calculating the volatility adjustment Now more dependant on each insurer's situation	Depends on the level of the risk-corrected spread	In the current conditions, the new rules will reduce the SCR of insurer with a high credit sensitivity ratio
4 Long-term equity investments Eligibility conditions simplified	↑	The simplified conditions should increase the use of this module. This would therefore reduce the SCR for the same equity investment level
5 Adjustment of the correlation matrix Reduction of the correlation between spread and interest-rate risks in downward shock scenario	↑	The impact will be more significant on insurers with a high interest-rate SCR and a high spread SCR
6 Equity symmetric adjustment Increase of the bandwidth	Depends on the equity movements	This will reduce further the pro-cyclicality of the equity investments
7 Reduction of the risk margin	↑	This will reduce the capital needed to face risk margins and stimulate investment in the industry
8 Scenario analysis on climate change	-	This will ensure that climate risks are better taken into account by the industry

THE EIGHT MAIN AMENDMENTS

1 MODIFICATION OF THE DISCOUNT CURVE

One of the key elements among the EC Solvency II revisions is a new Risk Free Rate (RFR) curve to discount insurers' liabilities. The main driver of this change is the extrapolation method used to define the different points of the curve between the FSP (First Smoothing Point, which is the 20-year point for the euro curve) and the UFR (Ultimate Forward Rate).

Until now, the extrapolation was based on the Smith Wilson methodology. The consequence of using Smith Wilson is that there is no interest-rate sensitivity beyond the FSP with a sensitivity of long-dated liabilities concentrated at the 20-year point and with a reduced sensitivity at the 15-year point compared to a market curve. This means that if an insurer wants to hedge its long-term liabilities from a regulatory perspective, it has to concentrate the sensitivity of its portfolio at the 20-year point.

The proposed new extrapolation method takes into account information on longer-term market interest rates beyond 20 years. It also results in a more natural distribution of interest-rate sensitivities over the curve for liabilities.

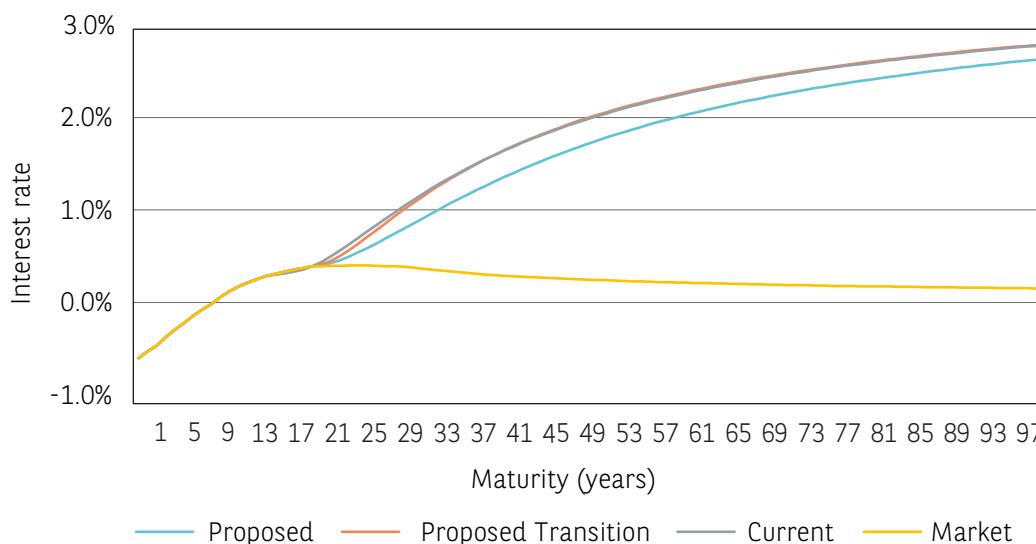
In general, it will increase the sensitivity at the 15-year point, reduce the sensitivity at the 20-year point and introduce sensitivity to interest rates beyond the 20-year point. The new methodology will better align 'regulatory' sensitivities over the curve with the true 'market' curve than does the current method.

The regulation allows for a transition from the existing curve to the new one, over a period to the end of 2031. The envisioned transition mechanism will initially have no impact on the curve's level, but it will affect the interest-rate sensitivity of liabilities from day one.

During the ensuing transition years (until the end of 2031), assuming similar market conditions, we would expect to see the new RFR curve at a lower level than it is currently. The main impact will be an increase in the discounted liabilities value and a reduction in the solvency ratio of insurers with long-term liability cash-flows.

Exhibit 1 shows the current curve (grey), the new proposed curve after transition at the end of 2031 (blue), the new proposed curve at the start of the transition (orange) and the market curve (yellow).

Exhibit 1: Solvency II revisions: Evolution of the basic risk-free curve



Source: BNP Paribas Asset Management, December 2021

To calculate the new proposed curve, the forward rates beyond the First Smoothing Point (kept at the 20-year point for the euro) will be a weighted average of the Last Liquid Forward Rate (LLFR) and the UFR. The UFR was at 3.6% at the end of November 2021.

$$f_{FSP, FSP+h} = \ln(1 + UFR) + (LLFR - \ln(1 + UFR)) * B(a, h)$$

$$B(a, h) = \frac{1 - e^{-ah}}{ah}$$

The LLFR itself will be a weighted average of market forward rates based on the 15, 20, 25, 30, 40 and 50-year swap rates, with weights proportional to the traded volume on each point.

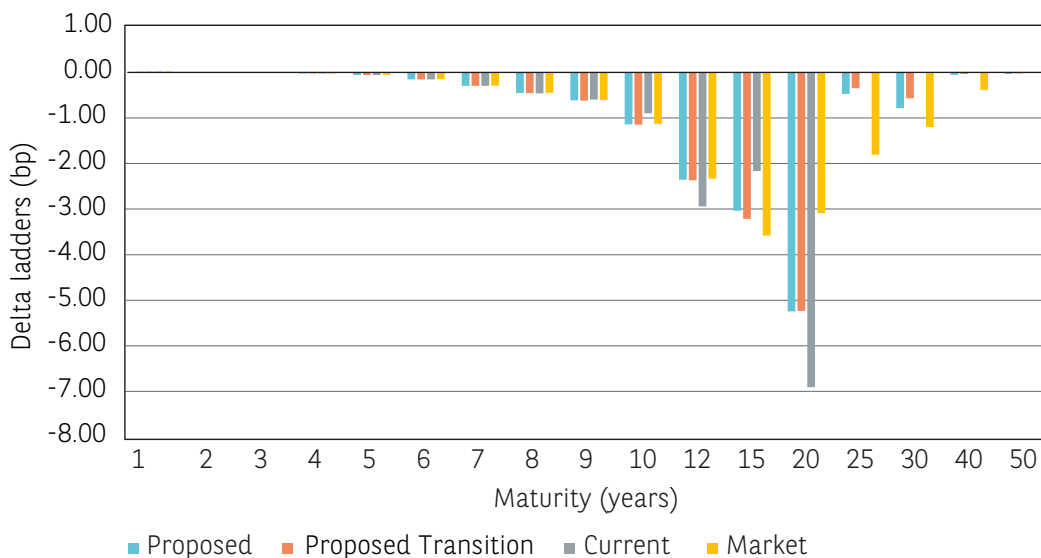
$$LLFR = w_{20} * f_{15,20} + w_{25} * f_{20,25} + w_{30} * f_{20,30} + w_{40} * f_{20,40} + w_{50} * f_{20,50}$$

We have approximated the weights (w) based on EIOPA's background analysis.

In addition, to take into account the transition period, a parameter, 'a', is used to calibrate the convergence speed of the LLFR to the UFR. This factor is expected to be set initially at between 10% and 20%. To minimise disruption, it will be calibrated to match, as closely as possible, the current Solvency II curve. The objective is then to decrease this parameter linearly over time to reach 10% at the end of the transition period. This reduces the convergence speed from the LLFR to the UFR.

In terms of the interest-rate sensitivity of liabilities, the situation has evolved. This is shown in Exhibit 2, which illustrates the sensitivity of a typical liability cash-flow of an insurance company running both life and non-life activities with a duration of 15 years. The sensitivity is illustrated by the delta ladders (which is the change in the value of the liabilities resulting from a one basis point increase in the interest-rate term structure) for each point of the curve. The blue bars (based on the proposed curve) shows a sensitivity spread over different points, including beyond the 20-year point, while for the grey bar (current curve), the sensitivity at the 20-year point is much larger, with that of the 15-year point being reduced. We also see that the proposed curve at the start of the transition (orange) shows some sensitivities beyond the 20-year point, meaning that the change of sensitivity appears on day one of the transition, even if it is not reflected in the level of the orange curve (see Exhibit 1).

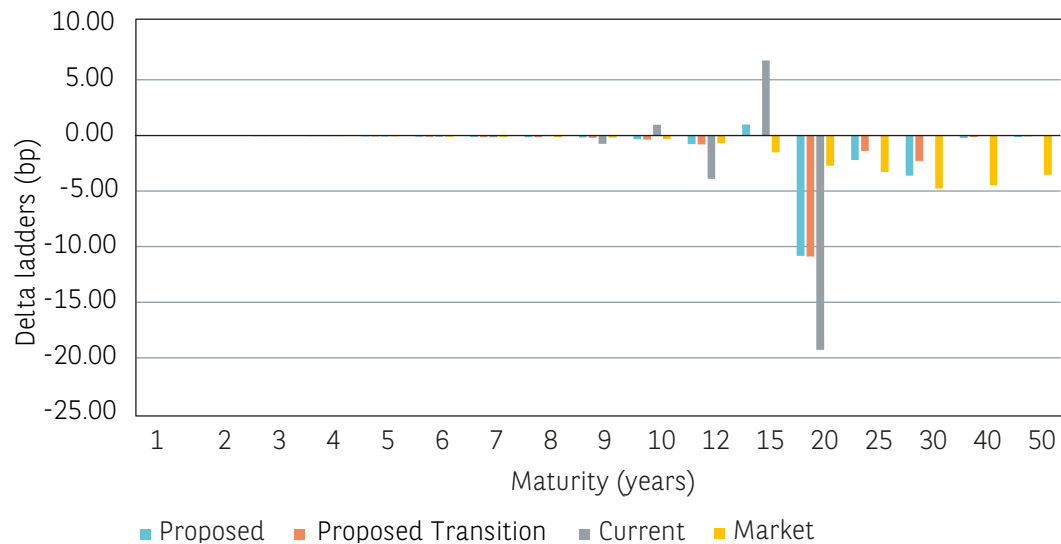
Exhibit 2: Illustrative delta ladder - Insurance cash-flows
(combination of both life and non-life activities)



Source: BNP Paribas Asset Management, December 2021

Of course, such sensitivities are dependent on each insurance company’s cash-flow pattern. For companies, such as life insurers, with longer-duration liabilities (with, for instance, a duration of 22 years), the sensitivities beyond the 20-year point will increase, while the sensitivity at the 20-year point will decrease more (as depicted in Exhibit 3) compared to an insurer with shorter duration liabilities.

Broadly, the consequence of this change in the RFR curve is that insurers hedging some of their liabilities to contain their SCR will have to adjust their hedging strategy.

Exhibit 3: Illustrative delta ladder - Life insurer cash-flows

Source: BNP Paribas Asset Management, December 2021

2 AMENDMENT RELATING TO INTEREST-RATE SHOCKS

The second big change in the proposed regulation concerns interest-rate shocks. Under the existing Solvency II regulation, such shocks are based on a matrix that provides a relative percentage variation to apply to the interest rate for each maturity (between Year 1 and Year 90). This matrix is different depending on whether interest rates move suddenly higher or lower. The percentages also decrease with the maturities. For maturities of less than one year, the percentage is aligned to the percentage of Year One; for maturities above Year 90, the percentage is aligned to that of Year 90. There are two other constraints:

- On upward shocks, the interest-rate increase (in absolute terms) for any maturity should be at least 1%
- On downward shocks, there is no shock if the interest rate is negative.

This approach creates an asymmetry between the curves relating to upward and downward shocks. EIOPA and the EC are thus seeking to bring this SCR module more in line with current market conditions. EIOPA's proposal includes a number of new elements:

- An absolute percentage shock is added to the relative percentage shock per maturity applied to the current level of interest rate for maturities of between 1 and 20 years. There is a different matrix for upward and downward shocks, according to the following formulas:

- On the upward shock: $r_t^{up}(m) = r_t(m) \cdot (1 + s_m^{up}) + b_m^{up}$

- On the downward shock: $r_t^{down}(m) = r_t(m) \cdot (1 - s_m^{down}) - b_m^{down}$

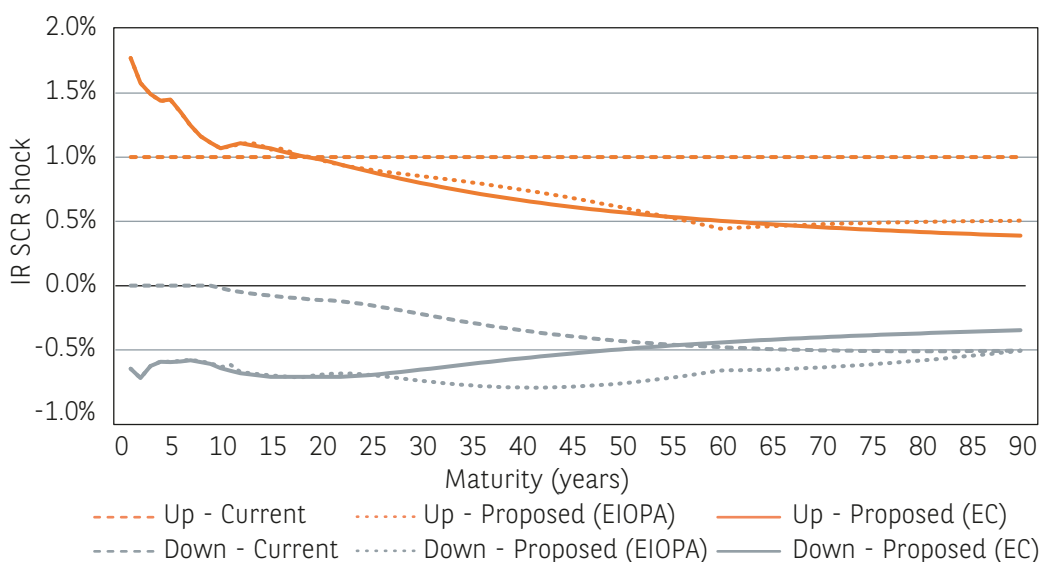
Where:

- $r_t(m)$ is the current risk-free rate for a maturity m
 - s_m^{up} and b_m^{up} are respectively a relative and absolute shock on the upside, calibrated for each maturity
 - s_m^{down} and b_m^{down} are respectively a relative and absolute shock on the downside, calibrated for each maturity.
- For maturities below 1 year, the parameters s_m and b_m are the same as for the 1-year maturity. For maturities of between 20 and 90 years, an interpolation methodology is used.
 - On the downward shock, the shocked interest rate for any maturity cannot be below -1.25%.
 - On the downward shock, there is a shock applied even if the interest rate is negative.

The EC proposal is to retain the main elements proposed by EIOPA up to the FSP, but also to shock the UFR by +15bp and -15bp to compute the shocks for maturities above 20 years using the curve extrapolation method instead of an interpolation.

These changes bring about significant adjustments to the size of the shocks, as depicted in Exhibit 4, where the EC proposal is based on our own interpretation of the EC’s communication.

Exhibit 4: Current and proposed IR SCR shocks using proposed RFR curve



Source: BNP Paribas Asset Management, December 2021

This translates into very different upward and downward shocked curves in EIOPA’s proposal (see Exhibit 6), for instance, compared to the current situation (see Exhibit 5). The proposed upward and downward curves exhibit more symmetry compared to the current shocked curves.

Exhibit 5: Current RFR and shocked RFR curves

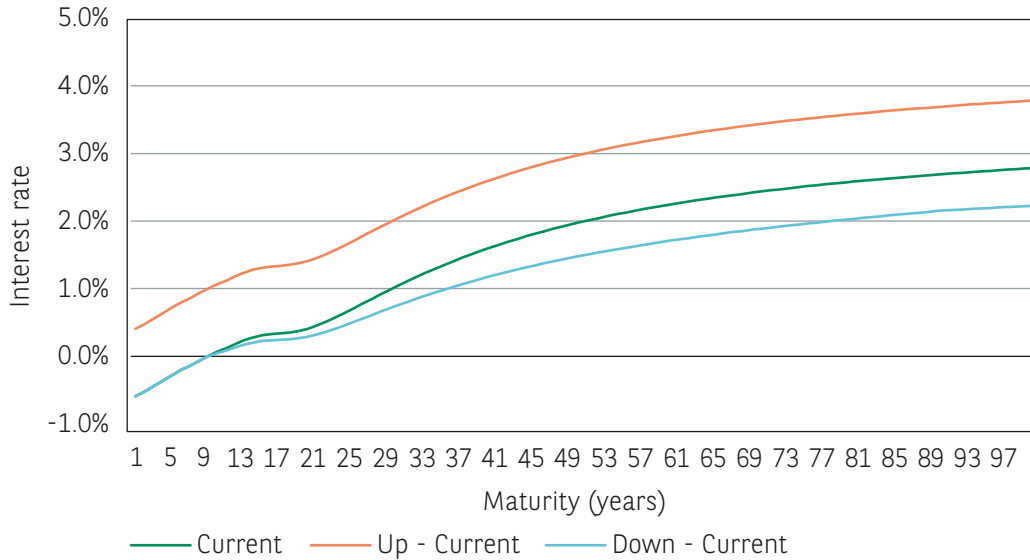
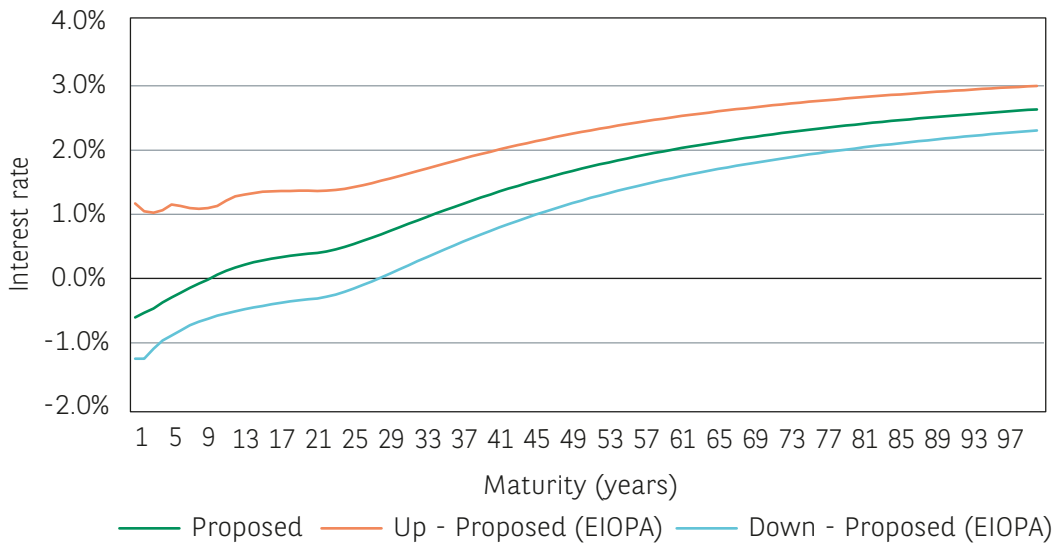


Exhibit 6: Proposed RFR and shocked RFR curves



Source: BNP Paribas Asset Management, December 2021

The impact of these changes will mainly concern:

- Life insurers with long-duration liabilities and a marked duration mismatch between their assets and liabilities. Their Interest Rate (IR) SCR is usually impacted by a downward shock, which under the new proposal will be much larger. This will result in a larger IR SCR. In particular, life insurers with some cash and short-term exposures will have a high capital charge, unlike now.
- More generally, insurers with a duration mismatch. Nevertheless, insurance companies with short liabilities (such as health insurers) could continue to have a longer duration portfolio. Indeed, if the solvency margin permits, upward interest-rate shocks would not differ so much in the five to 10-year maturity segment, which is where a better yield could be accessed.

As an illustration, assuming an insurer with a liabilities duration of 15 years and an assets duration of seven years, the IR SCR would be multiplied by more than five-fold under the EC's proposal compared to the current situation:

	SCR IR (% assets)
Current	-1.2%
Proposed (EC)	-6.6%

Source: BNP Paribas Asset Management, December 2021

This should naturally push insurers to hedge more of their interest-rate risk if they want to reduce their SCR, assuming no other considerations are taken into account (e.g. accounting reasons or market views).

It is important to note that the transition from the current treatment of interest-rate shocks to the proposed approach will be spread over five years. The gradual implementation suggested by EIOPA in its background analysis is to only implement the downward shock gradually by blending the SCR using the proposed shock with that produced when using the current shocks with an initial weight of 1/5 on the SCR using the proposed shock. This weight will increase each year to fully reach the proposed shock after five years.

③ NEW APPROACH TO CALCULATING THE VOLATILITY ADJUSTMENT

The volatility adjustment (VA) is intended to mitigate the short-term volatility of insurers' solvency. The VA takes into account insurance companies' long-term perspective. It reduces the impact of short-term changes in credit spreads on the valuation of insurance liabilities, thus helping to make capital resources less volatile.

The EC has decided to change the methodology to calculate the VA. Its main objective is that the size of the VA should be more dependent on the situation and credit sensitivity of each insurer rather than using a default VA for all insurers.

Under the current Solvency II regulation, the VA is defined per currency and can allow for a country-specific adjustment under explicit conditions. The currency VA is equal to 65% of the risk-corrected currency spread (S_{crncy}^{RC}). This risk-corrected currency spread is equal to the spread earned from a reference portfolio over the basic risk-free interest rate, minus a risk correction which corresponds to the portion of the spread attributable to expected losses and costs of downgrades.

$$VA_{crncy} = 65\% * S_{crncy}^{RC}$$

The country-specific adjustment is applicable only when the risk-corrected country spread is greater than 100bp and higher than twice the risk-corrected currency spread. In such a case, the difference between the risk-corrected country spread and twice the risk-corrected currency spread is added to the risk-corrected currency spread.

$$VA_{total} = 65\% * (S_{crncy}^{RC} + \max(S_{country}^{RC} - 2S_{crncy}^{RC}; 0)) \text{ if } S_{country}^{RC} > 100bps$$

Under the EC's new proposal, the VA will benefit from:

- An increase of the 65% coefficient to 85%...
- ...but with an undertaking-specific adjustment to capture the insurer's actual assets sensitivity to changes in credit spreads against the technical provisions sensitivity to changes in the interest rate.

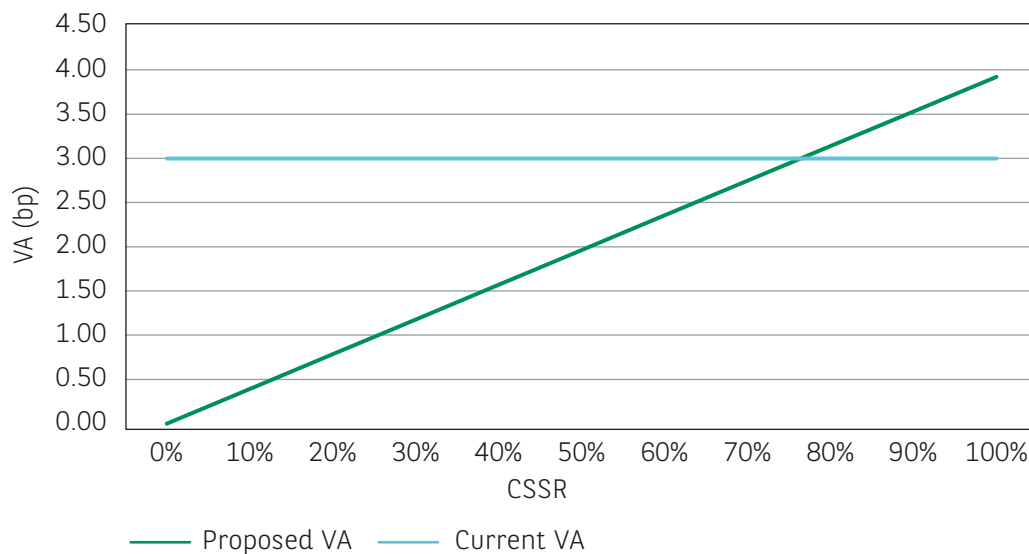
$$VA_{crncy} = 85\% * CSSR_{crncy} * S_{crncy}^{RC}$$

Where $CSSR_{crncy}$ is the ratio of the credit sensitivity of the assets to the interest-rate sensitivity of the liabilities of an insurer, it should be positive, but not exceed 1.

This means that the new ratio of credit sensitivity needs to be above 76% for an insurer to reach a higher VA compared to today ($76\% * 85\% = 65\%$), as shown in Exhibit 7. So, under the new regime, insurers with a high credit sensitivity compared to the interest-rate sensitivity of their liabilities will benefit from a higher VA as well as a lower valuation of their liabilities.

Please note that a country-specific adjustment is maintained under the new proposals, but has been revisited.

Exhibit 7: Volatility adjuster (VA) for euro



Source: BNP Paribas Asset Management, December 2021

4 CHANGES TO THE ELIGIBILITY CONDITIONS FOR LONG-TERM EQUITY INVESTMENTS (LTEI)

The EC has reviewed the eligibility criteria for the long-term equity investments (LTEI) module (detailed in Article 171a of the delegated act) giving access to a reduced SCR (22% instead of 39% for Type 1 equity). The main objective of the LTEI is to better take into account the long-term nature of insurers' activity and help the sector to finance the economy.

Until now, the complexity of the criteria had inhibited the use of this module. The EC has therefore followed EIOPA's recommendations to review the criteria so as to make LTEI more attractive to insurers. The proposed new eligibility conditions for LTEI are:

- The equity pocket (which includes the LTEI module) has to be clearly identified and managed separately from the insurer's other activities.
- The equity pocket is assigned to cover the obligations corresponding to one or several of the insurer's identified businesses.
- The equity pocket has to be made up of listed equities from the European Economic Area (EEA), or unlisted equities of companies that have their head offices in EEA countries. A new condition is that the portfolio has to be sufficiently diversified to avoid excessive risk on a specific issuer.
- A policy covering the long-term investment management of the equity pocket is required and must ensure a commitment that the global equity exposure will be held on average for five years. This seems to be a change compared to the previous conditions where it was clearly specified that the holding period had to be on average five years. Therefore, no operations in the equity pocket were authorised until the equity pocket's average holding was five years.
- The insurer must demonstrate either that its assigned life insurance liabilities are relatively illiquid (Type 1 or 2, as defined in the regulation) and have a Macaulay duration¹ of more than 10 years, or, that it has a sufficiently large liquidity buffer for its assigned non-life liabilities and assigned equity portfolio.

The main idea is to ensure that the equity pocket covers either long-term liabilities or that there will be no forced sale to fulfil the liabilities. This condition has changed as, until now, the insurer had to demonstrate that under stress conditions, it could avoid forced sales from the equity pocket for at least 10 years.

These two last conditions have the objective of simplifying the application for the LTEI module.

In addition to the eligibility conditions, the regulation specifies that:

- For an investment in a fund, the different eligibility conditions apply at the fund level, not at the level of the underlying investments in the fund.
- If an insurer cannot meet the above conditions, it will lose the benefit from the favourable SCR treatment of the LTEI and will not be able to re-apply for it for a period of 36 months.
- The EC added a new element in its latest review, which excludes participations from the LTEI module.
- Diversification of LTEI will be partly limited as the LTEI equity risk charge will be added to the Type 1 and Type 2 equity charge and no diversification with short-term equity risks would apply.

¹ The Macaulay duration is the weighted average term to maturity of the cash flows from a bond.

5 ADJUSTMENT OF THE CORRELATION MATRIX

EIOPA proposes only changing the correlation matrix in cases of downward interest-rate shocks. The change concerns exclusively the correlation between the spread and the interest-rate risks, which has been reduced from 50% to 25%. This will broadly reduce the total market SCR for insurers with a large interest-rate and spread SCR.

To illustrate the impact of this, let us assume a total market SCR split as follows for the downward shock:

	Interest	Equity	Spread	Currency
Market SCR	6%	7%	4%	3%

Source: BNP Paribas Asset Management, December 2021

In this case, the total market SCR would be reduced from 15.6% to 15.2% when using the new correlation matrix for the downward shock.

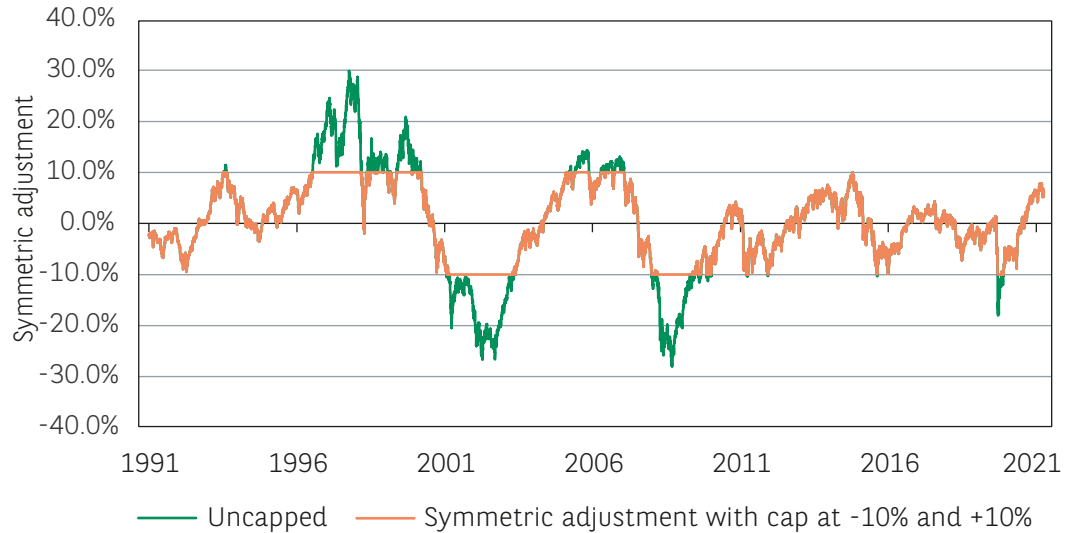
6 BROADENING OF THE SYMMETRIC EQUITY ADJUSTMENT BANDWIDTH

The symmetric equity adjustment is used to reduce the procyclical character of an insurer's equity investment. The objective is to make equities less expensive in terms of SCR after a market drop and more expensive after a market rise. This symmetric adjustment is based on the current level of a reference portfolio compared to its average level over the last three years. The regulation initially defined a minimum of -10% and a maximum of +10% for this symmetric adjustment, which is applied to both Type 1 and Type 2 equities having respectively an SCR shock of 39% and 49% (before symmetric adjustment). The symmetric adjustment is communicated each month by EIOPA. At the end of December 2021, it stood at 6.88%.

In reviewing Solvency II, both EIOPA and the EC advised broadening this -10% to +10% bandwidth to -17% to +17%. Again, the main objective is to reduce procyclicality and avoid the insurance industry having to sell equity positions at the worst time (for instance, after a market drop and when the solvency ratio has suffered), when such an investment usually has a longer-term investment horizon and helps to finance the economy.

This change will have a real impact in very strong bull markets (like in the 1990s or the period from 2005 to 2007) where the symmetric adjustment has until now been capped at +10%. The same applies in bear markets or crisis periods (like the dotcom bubble, the Global Financial Crisis or the Covid pandemic), when the symmetric adjustment has under the existing regulation been capped at -10%, as shown in Exhibit 8.

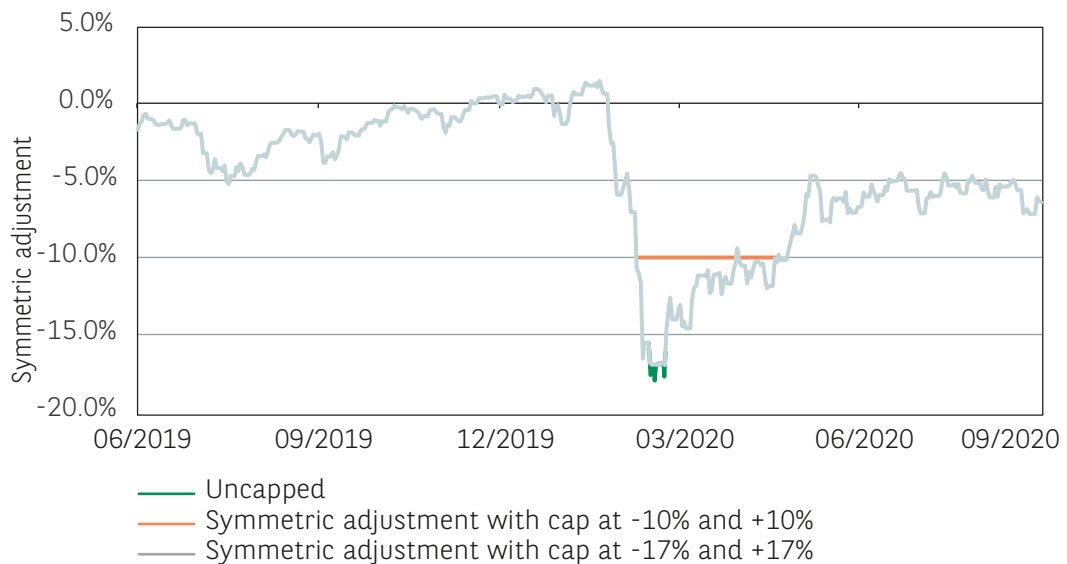
Exhibit 8: Symmetric adjustment



Source: BNP Paribas Asset Management, data as at December 2021

Under the proposed changes to Solvency II, when strong bull or bear markets occur, the symmetric adjustment will not typically be capped so quickly. This is illustrated in Exhibit 9, which shows how, under the new proposal, the symmetric adjustment would have evolved in 2020 (in grey), with the floor of -17% triggered in March 2020.

Exhibit 9: Proposed symmetric adjustment (focus on 2020)



Source: EIOPA, BNP Paribas Asset Management, data as at December 2021

Today, for this larger bandwidth of the symmetric adjustment to be triggered, the current level of the reference portfolio should be at least 28% higher (or 12% lower) than its average level over the last three years.

7 RISK MARGIN REDUCTION

The risk margin regulated by Solvency II is designed to cover non-hedgeable risks should an insurer's activity be transferred to a third party. The objective is to ensure that the value of the technical provisions is sufficiently high for the third party to take over the liabilities and meet its new obligations. The method used to do so is based on a cost-of-capital approach.

The revision proposed by the EC aims to reduce the size and volatility of the risk margin as the current formula is viewed as being too conservative (i.e. the initial margins are too large) compared to what is expected to be the case in actual transactions. The EC (following to some extent EIOPA's recommendations) proposes:

- Reducing the cost of capital (CoC) from 6% to 5% to better reflect the reduction of cost of capital seen in the insurance industry over recent years.
- Introducing a time factor (λ), which would reduce the risk margin associated with long-term liabilities and therefore reduce its interest-rate sensitivity.

This risk margin reduction is expected to translate into a reduction in the amount of capital needed to cover the risk margin and an increase in the solvency ratio; both these factors should stimulate investment in the industry.

The risk margin is the cost of mobilising capital that a third party would support by acquiring new liabilities. The proposed formula for the risk margin is:

$$\text{Risk margin} = \text{CoC (5\%)} * \sum \text{SCR}(t) * \frac{\lambda^{t+1}}{(1+r_{t+1})^{t+1}} \text{ with } \lambda = 0.975$$

Example: Assuming a discount rate r of 1%

Maturity (t)	Best estimate liabilities	SCR of the liabilities	λ^{t+1}	SCR * λ^{t+1}	Discounted SCR * λ^{t+1}	Discounted SCR * λ^{t+1} * CoC
1	100	20	0.950625	19.0	18.8	0.9
2	80	17	0.926859	15.8	15.4	0.8
3	60	15	0.903688	13.6	13.2	0.7
4	40	10	0.881096	8.8	8.5	0.4
5	40	10	0.859068	8.6	8.2	0.4
6	30	7	0.837592	5.9	5.5	0.3
Total risk margin						3.5

Source: BNP Paribas Asset Management, December 2021

8 INTRODUCTION OF CLIMATE CHANGE SCENARIO ANALYSIS

With the world seeking solutions to the challenges of climate change, the insurance industry is exploring how its contribution to financing a low-carbon economy could be further increased. One element of the review of Solvency II was thus to analyse whether the regulation could be amended to introduce differentiated capital requirement treatments for 'green' versus 'brown' assets. At this stage, no decision has been taken but the EC has mandated EIOPA to make an assessment for June 2023 in relation to dedicated treatment of green and brown assets and activities. There is a debate in the industry with some industry members considering the aim of the solvency capital requirement is to protect insurers against financial risks. In their view, such financial risks and potential default risks are not necessarily reduced by the green characteristics of an issuer, making it difficult to justify why a 'green' investment should benefit from an SCR reduction.

However, in its text, the EC has decided to introduce a requirement for insurers to conduct climate change scenario analyses to assess the impact of climate change on their activities and financial results. This will be part of Pillar 2 of the ORSA (Own Risk and Solvency Assessment) regulation conducted by insurers. The analysis will be based on two long-term climate change scenarios:

- Where the global temperature increase remains below 2°C
- Where the global temperature increase is equal to or higher than 2°C.

The objective is to ensure that the insurance industry better takes into account and manages climate risks and the associated systemic risks.

AUTHORS

Within BNP Paribas Asset Management, we have a dedicated insurance team. These experts closely monitor changes to the regulatory and accounting frameworks impacting insurers.

Our objective is to accompany insurance companies as these evolve. We seek to build and manage the best investment solutions corresponding to our clients' specific needs.

As at the end of December 2021, BNP Paribas Asset Management managed over EUR 100 billion of assets for insurers.



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