

The PRA QIS Exercise

What does it cover and what will it mean for firms?

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On the 20 July 2021, the Prudential Regulation Authority (PRA) launched its Quantitative Impact Study (QIS) covering the review of Solvency II in the UK. This forms part of the wider ongoing review of the UK's insurance regulatory environment being led by the UK Government, and in particular HM Treasury (HMT).

Milliman consultants shared a [paper](#) on the information published to date as part of the HMT Review and wider review of the UK insurance regulatory regime in July 2021.

Following on from HMT's [Call for Evidence](#) and its responses, the Government has asked the PRA to model the different options under consideration to better understand the potential impact of any reforms. To achieve this goal the PRA has launched its QIS exercise which focusses on the following areas:

- The Risk Margin
- The Matching Adjustment (**MA**)
- The calculation of the transitional measure on technical provisions (**TMTP**)

The deadline for submitting a response to the QIS exercise is **20 October 2021**, with completion of the exercise being voluntary for firms. The PRA has stated that it encourages and welcomes submissions from any firm that wishes to do so and sets out in its recent [Dear CEO Letter](#) that a number of firms will be contacted directly to ensure a reasonable coverage of the insurance industry. Participants are encouraged to provide feedback and queries within the first few weeks of publication (the publication date being 20 July 2021).

Whilst the PRA has asked particular firms to participate to ensure that they have sufficient breadth of responses, we expect other firms will be paying close attention to this exercise. Although the PRA has stressed that the QIS should not be interpreted as policy proposals, it would be prudent for firms to consider the impact each run within the exercise could have on their own balance sheet. We are aware that the PRA has contacted a number of firms across the industry to strongly encourage them to submit a response to the QIS.

The areas covered by the QIS were highlighted in a speech given by the PRA's Anna Sweeney on 15 June 2021. In this speech, the PRA made it clear that the QIS exercise will require insurers to make significant resources available and, in particular, that they expect high-quality validated responses from firms. The speech also noted that changes to the Standard Formula SCR are not going to be considered as part of this QIS exercise. The need for high quality data from participants was reiterated in the Dear CEO Letter. The letter also acknowledged the tight timescales for completion of the QIS but requested that firms invited to participate should prioritise resourcing accordingly so that submissions are to the standard required for policymaking purposes.

Details of the initial speech given by the PRA can be found [here](#) and the PRA has subsequently set up a [QIS webpage](#) where the details of the QIS and related matters are published.

The key documents for firms taking part in the QIS exercise are:

- The Main QIS template – the Excel template that firms will submit to the PRA;
- The QIS data sheet for MA asset and liability cashflows – an additional Excel template to be completed by firms with MA approval; and
- The QIS Instructions – a document outlining how to complete the template.

In addition to quantitative aspects considered in the QIS, the PRA will also ask firms a series of qualitative questions, on areas such as the eligibility criteria for assets in the MA portfolios and the MA and Internal Model approval processes. These will be issued to firms sometime in August 2021.

This paper is not intended as a step-by-step guide to completing the QIS but to give an overview of what is expected of firms alongside insight into the key considerations and potential challenges for firms. The appendices to this paper do provide high-level information on how the individual runs required should be calibrated.

QIS work can be outsourced to consultants, providing that the required validation and governance is carried out by the firm itself (further details below). Please speak to one of the contacts listed on this paper, or your usual Milliman consultant, to discuss how we can help with the completion of the QIS exercise.

Submissions are made via the Bank of England Electronic Data Submission (**BEEDs**) using the published [Excel template](#).

SCOPE

Solo life firms are within scope of the QIS, but UK groups are out of scope (unless specifically contacted). Some firms have received an invitation via the BEEDs to participate in the QIS, however the PRA welcomes responses from all other UK regulated firms. The QIS exercise covers both life and non-life insurance firms and composite firms should provide data for all lines of business. This paper focusses on the QIS exercise in the context of life insurers.

VALIDATION AND GOVERNANCE

Firms are asked to validate the data they submit. Specifically, the PRA asks that QIS information is consistent with the Quantitative Reporting Templates (**QRTs**), consistent with the MA asset and liability information request (see below) (where relevant) and that reasonableness checks are undertaken on balance sheet movements. Sign-off by an appropriate person under the Senior Managers and Certification Regime (**SM&CR**) is required. Firms are expected to explain where the QIS submission does not reconcile with the year-end 2020 QRTs. We expect that this type of validation and governance is normal practice for firms, but checks may require additional thought and resource given that the required changes to assumptions and modelling may not have been considered previously and are to be undertaken within a relatively short timeframe.

MA DATA REQUEST

Alongside the QIS exercise itself, the PRA has launched an initial data gathering exercise in relation to the MA on 16 June 2021. This data request focused on firms with MA approval and seeks to collect detailed data on asset and liability cashflows relating to insurers' MA portfolios. Milliman shared a summary of the MA Data Request as part of our previous article on the [UK Review of Solvency II](#).

Sensitivity Testing

Across the various required runs for the QIS exercise, participants are asked to vary a number of specified factors and changes to test the sensitivity of their balance sheets. The items firms will be assessing across various combinations include:

- Alternative Risk Margin methodologies;
- Alternative designs for the MA;
- Recalculation of firm's TMTP as at year-end 2020;

- Transition to a Sterling Overnight Index Average (**SONIA**)-based risk-free rate curve;
- Changes to government bond yields and risk-free rates (+200bps and -100bps scenarios);
- Credit spread changes (Moderate and Severe scenarios); and
- Credit downgrades.

All of the items mentioned above are detailed later in this paper.

Scenario Specifications

Firms taking part in the QIS exercise are required to complete up to **19** different runs. These runs are denoted using IDs 0-18 and are set out across three overarching scenarios:

- **A baseline/BAU scenario**, where the Risk Margin and MA are unchanged from existing methodologies.
The baseline scenario includes runs 0 to 6. Run 0 is the regulatory Solvency II position reported at year-end 2020, Run 1 is the notional TMTP recalculation and Run 2 is the switch to a SONIA based risk-free curve, which informs the revised baseline Solvency II balance sheet and SCR position against which subsequent runs can be compared. Also included in the baseline / BAU scenario are interest rate and credit sensitivities (the latter being applicable only to firms that have approval to use the MA and/or the Volatility Adjustment (**VA**)).
- **Scenario A** where the Risk Margin follows the margin over current estimate (**MOCE**) approach and the MA is based on a Fundamental Spread (**FS**) equal to 25% of current Z-spreads¹ plus 25% of average spreads with caps and floors applied to all but risk-free assets, and the higher Valuation Uncertainty² applied to assets classified as Level 2 and Level 3 under International Financial Reporting Standards (**IFRS**) (all else being broadly similar to the current FS).
Scenario A includes runs 7 to 12. Run 7 is the baseline run and is based on Run 2 allowing for the Risk Margin and MA changes noted above. Runs 8 to 12 are interest rate and credit sensitivity runs (the latter being applicable only to firms that have approval to use the MA and/or VA).
- **Scenario B** where the Risk Margin follows the 'lambda factor' approach and the MA is based on a FS equal to 25% of current Z-spreads applied to all but risk-free assets with floors only (no caps applied), and the lower Valuation Uncertainty applied to assets which are classified as Level 2 and Level 3 under IFRS (all else being broadly similar to the current FS).

¹ The Z-spread or zero-volatility spread of an asset is the constant level of spread above the gilt spot rate curve required for the asset price to equal the present value of the cashflows.

² Valuation Uncertainty is covered in detail in the Matching Adjustment section of this paper.

Scenario B includes runs 13 to 18. Run 13 is the baseline run and is based on Run 2 allowing for the Risk Margin and MA changes noted above. Runs 14 to 18 are interest rate and credit sensitivity runs (the latter being applicable only to firms that have approval to use the MA and/or VA).

The MOCE and lambda factor approaches are covered in detail in the Risk Margin section of this paper. The two MA approaches in Scenario A and B are covered in the MA section of this paper.

The full set of runs spans a variety of potential reforms, confirmed reforms (such as the transition from the London Inter-Bank Offered Rate (**LIBOR**) to SONIA), and sensitivity tests.

A summary of the specifications for each run for is set out in Appendix A of this paper.

Not all firms will be required to carry out all 19 runs depending on the Solvency II long-term guarantee measures (**LTGMs**) the firm has in place. In particular there are:

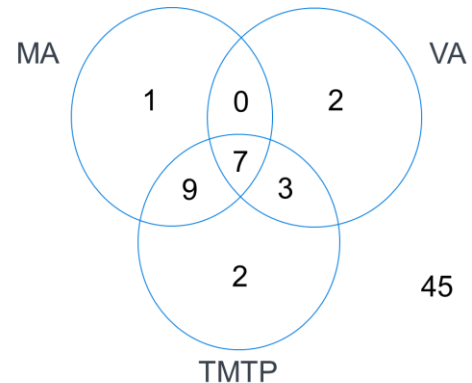
- Nine runs applicable to all firms;
- Nine further runs applicable only to firms with approval to use the VA and/or MA. These runs focus on credit sensitivities; and
- One further run applicable to firms with approval to use the TMTP.

Based on our analysis of year-end 2020 Solvency and Financial Condition Reports (**SFCRs**)³ focusing on sixty-nine solo entities we note that there are:

- 45 firms which would only need to complete the core 9 runs;
- 3 firms which would need to complete 18 runs - all runs excluding the run applicable to TMTP users;
- 2 firms which would need to complete 10 runs – the base 9 runs plus the run applicable to TMTP users; and
- 19 firms which would need to complete all 19 runs.

A detailed breakdown of the number of firms using each LTGM is shown in Figure 1.

FIGURE 1: NUMBER OF FIRMS MAKING USE OF LTGMs (YEAR-END 2020)



The PRA has provided a QIS template, the structure of which is the same for all runs though only the relevant specified sections need to be completed. A summary of these specifications is set out in Appendix B.

Risk Margin

INTRODUCTION

The Risk Margin is likely to be the key focus of the QIS for many firms, particularly where firms do not make use of the MA or TMTP.

As part of the QIS exercise, participants will need to model two different potential methodology changes for the Risk Margin:

- In Scenario A, the Risk Margin will be calculated using a method comparable to the MOCE methodology outlined by the International Association of Insurance Supervisors (**IAIS**) as part of the Insurance Capital Standard (**ICS**).⁴
- In Scenario B, the Risk Margin is to be calculated using a risk tapering approach (also referred to as a 'lambda' approach) equivalent to that outlined in the EIOPA Solvency II 2020 Review.⁵

In the following sections, we examine the two alternative methodologies in more detail.

MARGIN OVER CURRENT ESTIMATE

The MOCE methodology has been put forward by the IAIS as part of the ICS⁶ and fulfils a similar function to the Risk Margin under that regime. Just like the current Solvency II Risk Margin, the MOCE is an additional margin held above the liabilities to provide some protection against the uncertainty in future cashflows related to the non-financial risks attached to them.

³ A full report covering Milliman's analysis of UK life insurers' year-end 2020 SFCRs will be published in the latter part of 2021. Past years' analysis can be found on the [Milliman website](#).

⁴ IAIS, *Level 1 Document: ICS Version 2.0 for the monitoring period*, Section 5.3

⁵ Milliman's summary of EIOPA's proposals as part of the Solvency II Review can be found [here](#)

⁶ Milliman's paper on the background of the ICS and which firms it will impact can be found [here](#)

The MOCE approach represents a shift away from the cost of capital approach that underpins the current Risk Margin calculation and replaces it with the confidence level approach used under the ICS.

The calculation of the MOCE is based on the 85th percentile of a normal distribution for life insurance business with the 65th percentile used for non-life business. The normal distribution used to calculate the MOCE is defined by:

- Mean - equal to the current estimate of the business obligations (the best estimate liability (**BEL**) under Solvency II including an allowance for MA and/or VA where applicable for firms); and
- 99.5th percentile - equal to the SCR for non-hedgeable risks.

This means the MOCE can be calculated formulaically from the above two inputs using the following method:

$$MOCE_p = SCR'_0 \times \frac{\Phi^{-1}(p)}{\Phi^{-1}(0.995)}$$

Where:

- $MOCE_p$ denotes the pth percentile MOCE i.e. the 85th or 65th dependent on the type of business
- SCR'_0 denotes the SCR for non-hedgeable risks at the valuation date; and
- Φ^{-1} refers to the inverse of the cumulative distribution function of the standard normal distribution.

This formulaic approach is reasonably simple but may require some consideration from firms to ensure the parameterisation is correct. However, once firms have a method for calculation it should be straightforward to replicate the calculations across all the runs under Scenario A.

When considering the non-hedgeable SCR for the MOCE calculation the PRA has stated that firms should include the same risks as would be captured under the existing Risk Margin methodology. In particular, the non-hedgeable SCR should allow for:

- Underwriting risks covering life, health, and non-life;
- Counterparty default risks;
- Operational risks;
- Diversification between the risks, with the exception that no diversification should be allowed between life and non-life insurance activities within a single firm;
- The impact of the MA and the VA on the discount rate and subsequent impact on the non-hedgeable SCR;

- The loss absorbing capacity of technical provisions (**LACTP**); and
- The presumption that the business will continue on a going concern basis and cover the existing business as well as future business expected to be written over the following twelve months. We discuss this further in 'Our Observations' section.

Firms should make no allowance in the MOCE calculation for the TMTP, transitional measures on interest rates, or the loss absorbing capacity of deferred tax (**LACDT**).

RISK TAPERING 'LAMBDA'

Scenario B for the Risk Margin uses a 'risk tapering' or 'lambda' approach that is equivalent to the method proposed by EIOPA in its 2020 Review of Solvency II. This is similar to the current Risk Margin framework with an added allowance for a time-dependent cost of capital in the form of a floored, exponential and time-dependent element λ .

If we denote the cost of capital by CoC , then the Risk Margin, (denoted as RM) under this approach is given by:

$$RM = CoC \times \sum_{t \geq 0} \frac{SCR_t \times \max(\lambda^t, 0.5)}{(1 + r_{t+1})^{t+1}}, \text{ where } \lambda = 0.975$$

The SCRs used in the calculation of the Risk Margin at each future timestep are multiplied by the lambda factor, λ^t , which reduces exponentially at each future timestep; however, this is subject to a maximum SCR reduction of 50%, which would bite in projection year 28. Overall, this approach will reduce the Risk Margin for all insurers relative to the current Solvency II Risk Margin methodology.

The QIS instructions note that the Risk Margin under this approach should be calculated without any allowance for the MA, the VA, the TMTP or the transitional measures on interest rates. Credit sensitivities will therefore not apply for the calculation of the Risk Margin under the risk tapering approach. This differs from the approach specified for the MOCE methodology under Scenario A where the MA and VA are included in the calculation.

In addition, firms that apply one of the Risk Margin simplifications set out in Guideline 62 and in the Technical Annex IV of the EIOPA Guidelines on the Valuation of Technical Provisions⁷ are required to adapt the QIS Risk Margin calculation as follows:

- Firms using Method 1 or 2 should carry out the full calculation defined above.
- Firms using Method 3 are required to use a lambda factor of $\lambda^{\frac{Duration}{t}}$; and

⁷ EIOPA-BoS-14/166

- Firms using Method 4 should multiply the percentage of the best estimate technical provisions by λ to estimate the risk margin.

Matching Adjustment

INTRODUCTION

Alongside the Risk Margin, the MA is another key area being assessed under the QIS.

On the MA, the PRA acknowledges that Solvency II was designed as a “one-size-fits-all” regime to apply across Europe, and as a result was only ever a partial fit to the UK market.

Additionally, the UK market has changed significantly since Solvency II was designed. At that time, annuity writers tended to hold mostly traditional assets such as corporate bonds, consistent with the assets used to calibrate the MA, and a small proportion in mortgages and loans. These firms now hold a much wider range of assets, with illiquid assets estimated to make up approximately 40% of the assets in MA portfolios at year-end 2020. There is also a risk of inconsistencies and inappropriate mappings being used by firms to set credit ratings for these alternative assets, with the MA calculation being heavily reliant on these ratings which are internally derived.

There is consequently a case for the MA to be reformed, and the QIS is designed to provide the PRA with the necessary data on the impact to insurers under a wide range of economic scenarios. The regulator will then use this information to design potential policies and in particular the QIS will help the PRA to understand how well these policies might perform with changes to economic conditions, to ensure that the level of benefit achieved by the MA is appropriate.

DESIGN VARIATIONS BEING CONSIDERED

While the PRA acknowledges insurers’ ability to recognise upfront excess spreads (illiquidity premium), it also notes that some of the illiquidity premium may relate to future credit losses, a feature of the current design of the MA that the PRA wishes to address in the future.

As the proportion of illiquid and long-term assets on insurers’ balance sheets continues to grow, the PRA’s proposed reforms to the MA are a key part of ensuring that insurers who are long-term investors are able to invest in ‘long-term productive assets’ and ‘assets consistent with the government’s objectives on climate change’.⁸

The PRA proposes two alternative possible design variations to the MA, both of which will be based on the following structure for the Portfolio FS:

- Expected loss;
- Adjustment for sovereign, supranational and quasi government exposures;
- Credit risk premium (**CRP**) which includes a floor such that it does not fall below a given level in bps; and
- Valuation Uncertainty (**VU**).

The two design variations represent switching on and off elements for the CRP, and changes to the size of the VU in basis points.

The application of the components within the FS is summarised in the following table:

TABLE 2: APPLICATION OF FS IN THE QIS SCENARIOS

Fundamental Spread component	Scenario A	Scenario B	Notes
Expected loss	Yes	Yes	Similar to current SII framework. Required to establish the ‘assigned portfolio of assets’ only (i.e. not added to FS)
Sovereign, supranational and quasi government	Yes	Yes	Similar to current SII framework
CRP	25% Z-spread plus 25% of 5-year average Caps: some Floors: yes	25% Z-spread Caps: no Floors: yes	5-year average index by credit quality and sector Caps and floors by credit quality and sector
VU	Yes	Yes	By credit quality and sector

In the following sections, we examine the four components of FS in more detail.

EXPECTED LOSS

Expected Loss is similar to the probability of default (**PD**) component of the FS in the current Solvency II framework. The PRA requires firms to use the PD published at year-end 2020 to risk adjust the cashflows of assets in Component A of the Matching Adjustment Portfolio (**MAP**). Other relevant inputs are also consistent with the current Solvency II framework—such as a

⁸ Anna Sweeney [speech](#) on Solvency II Review: protecting policyholders while improving the regime

30% recovery rate parameter and the formula for the de-risking of cashflows.⁹

As with the PD component of the FS, Expected Loss is used for determining the 'assigned portfolio of assets', i.e., Component A of the MAP balance sheet, and for the calculation of PRA Tests 1 and 3.¹⁰

ADJUSTMENT FOR SOVEREIGN, SUPRANATIONAL AND QUASI GOVERNMENT EXPOSURES

As with Expected Loss, the PRA requires that the FS treatment of sovereign, supranational and quasi government exposures is similar to that under the current Solvency II framework. To the extent that such assets are equivalent to government bonds, the FS is set equal to 30% of the long-term average spread (**LTAS**).

CREDIT RISK PREMIUM

The PRA sets the CRP as a percentage of spread at the level of individual assets, and it is made up of the following two components:

- A percentage (25% in both Scenarios A and B) applied to the current Z-spread of the asset, plus
- A percentage (25% in Scenario A and 0% in Scenario B) applied to the 5-year average spread on an index of the same sector and credit quality as the asset.

We summarise the methodology to calculate the CRP in the Table 3:

TABLE 3: METHODOLOGY FOR THE CALCULATION OF THE CRP

CRP component	Scenario A	Scenario B	Notes
Individual asset Z-spread	25%	25%	For each individual asset
<i>plus</i>			
5-year average spread	25%	0%	As given, by credit rating and sector
Floors applied?	Yes	Yes	As given, by credit rating and sector

⁹ See the formula in Paragraph 266 of EIOPA's Technical Documentation, available [here](#).

VALUATION UNCERTAINTY

VU is a new element in the design of the FS. As the name suggests, it is an addition to the FS for assets whose valuation may be subject to uncertainty. VU applies at the level of individual assets (except sovereign, supranational and quasi government exposures) and is expressed in basis points depending on the credit rating and IFRS fair value hierarchy level of the asset in question.

The IFRS fair value hierarchy levels are defined in *IFRS 13: Fair Value Measurement*. Under the standard, all financial instruments are measured at fair value and are classified into the following three-level hierarchy based on the lowest level of inputs that are significant to the fair value measurement of the financial instrument concerned:

- Level 1: quoted price (unadjusted) in active markets for identical assets and liabilities.
- Level 2: inputs other than quoted prices included within Level 1 that are observable from markets either directly or indirectly.
- Level 3: significant inputs for the asset or liability that are not based on observable market data.

The VU is set as follows (assets with a nil VU are not included below):

- Level 2 all credit ratings and Level 3 investment grade rated assets:
 - 7.5bps for Scenario A, and
 - 3.75bps for Scenario B.
- Level 3 sub-investment grade rated assets:
 - 25bps for Scenario A and
 - 12.5bps for Scenario B.

PORTFOLIO MATCHING ADJUSTMENT

The QIS instructions require the portfolio MA for Scenarios A and B to be calculated, in basis points, as the internal rate of return that equates the present value of the liability cashflows to the market value of the assigned portfolio of assets (i.e. the Component A assets) minus the portfolio FS for each of the three components discussed above (sovereign, supranational and quasi government exposures, CRP, and VU). The proposed methodology is broadly similar to the current Solvency II framework.

We note the PRA's expectation in the QIS instructions that a 'gross of reinsurance' treatment is their preferred approach.

¹⁰ Components A, B and C, and PRA cashflow matching tests are defined in *SS7/18 Solvency II: Matching Adjustment*, available [here](#).

Credit Spread and Downgrade Sensitivity

As part of the sensitivities required for the MA, the PRA also asks firms to perform three credit spread and downgrade sensitivities, which are applicable only to firms that have approval to use the MA and/or VA:

- A **‘moderate spread widening’** sensitivity

These stresses are defined in basis points, by credit rating and sector, and firms are required to apply the spread widening stresses to all individual assets’ Z-spreads (assets in MAP and non-MAP)
- An **‘extreme spread widening’** sensitivity

These stresses are defined in basis points, by credit rating, and firms are required to apply the spread widening stresses to all individual assets’ Z-spreads (in MAP and non-MAP).
- An **‘extreme spread widening and downgrade’** sensitivity

These stresses are defined as per the ‘extreme spread widening’ stresses above, and in addition firms are required to downgrade their asset portfolios (in MAP and non-MAP). The QIS instructions define the downgrade scenario in probabilities, representing the proportion of assets assumed to downgrade by one credit quality step.

The QIS instructions require firms to apply first the credit spread widening sensitivity, followed by the downgrade sensitivity; firms should not assume any diversification benefit. It should be noted that the downgrade sensitivity will not push firms into a higher spread stress due to the ordering of the requisite changes.

For the ‘moderate’ and ‘extreme’ spread widening sensitivities, the QIS instructions require that only the spot asset spread element of the portfolio FS be updated (i.e., the Z-spread). All other components of the portfolio FS should remain unchanged.

For the ‘extreme spread widening and downgrade’ sensitivity, the QIS instructions require that all portfolio FS components are updated to reflect the new credit quality for the proportion of assets that are assumed to have downgraded.

The QIS instructions also require participating firms to recalculate the portfolio MA in basis points and the MA benefit in GBP, including the update to all relevant portfolio FS components, rebalancing actions and/or asset injections that may be required to restore matching within the MAP.

LIBOR to SONIA Transition

On 3 June 2021, the PRA published Policy Statement (PS) 12/21, ‘Solvency II: Deep, liquid and transparent assessments, and GBP transition to SONIA,’ confirming that for the purpose of

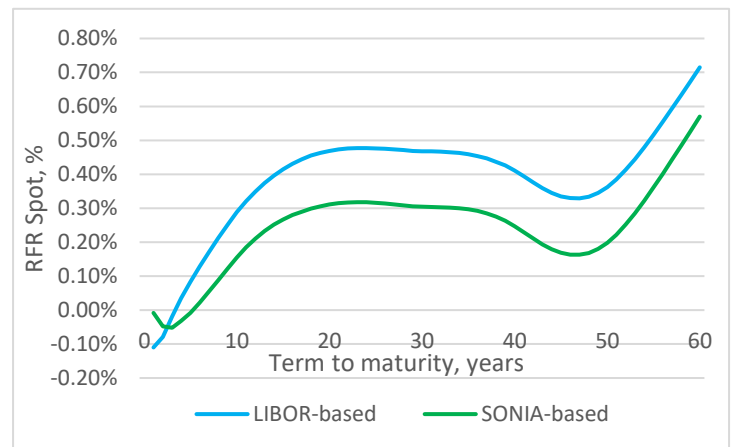
¹⁰ Speech by Anna Sweeney, Bank of England, at the JP Morgan European Insurance Conference, 15th June 2021.

Solvency II reporting starting from 31 July 2021, UK insurers should use the SONIA-referenced risk-free rate (RFR) curve for the GBP curve. Given the transition date, it is in line with our expectations that the PRA has proposed to use a SONIA-referenced RFR curve as the baseline curve for the majority of the QIS exercise. This allows the PRA to assess the potential impact on insurers of any possible regulatory policy to be put forward for consultation, and subsequently settled in 2022¹¹ (or possibly later) following the QIS exercise. Essentially, for all runs from Run ID 2 onwards, the baseline RFR curves are SONIA-based.

Our paper covering the transition of the UK Solvency II discount curve to SONIA can be found [here](#).

The chart below compares the LIBOR-referenced RFR to a SONIA-referenced RFR, provided by the PRA as part of the QIS, as at 31 December 2020.

FIGURE 4: GBP SOLVENCY II SPOT RATES AS AT 31 DECEMBER 2020



Term, yrs	1	5	10	15	20	25	30	35	40	45	50	55	60
LIBOR minus SONIA, bps	-10.2	9.1	13.4	14.8	15.8	16.0	16.3	16.2	16.4	16.6	16.4	15.5	14.5

Transitional Measure on Technical Provisions

The PRA wishes to understand how the TMTP is impacted under the various scenarios considered in the QIS. Participants with approval to use a TMTP are required to provide information on the breakdown of the TMTP as at the most recent recalculation date, as well as to recalculate the TMTP after carrying out each of

the scenario runs under the Baseline, Scenario A and Scenario B categories.

For each run, firms must provide details of the technical provisions (split out into BEL and Risk Margin) subject to the TMTP, as well as the technical provisions on a Solvency I basis.

The information on the most recent TMTP calculation is provided in the baseline Run 0 (as provided in the year-end 2020 regulatory submissions), and in baseline Run 1 firms are required to recalculate the TMTP as at year-end 2020, which may be identical to the information provided for Run 0 if that was the most recent recalculation date.

Additionally, participants are required to set out a breakdown of the TMTP (before the application of the Financial Resources Requirement (**FRR**) cap) at the date of its last recalculation, into its components including the Risk Margin, contract boundaries, the risk-free rate, the MA and the VA. Participants must also provide information on key drivers that affect the components of the TMTP such as relationships with factors like interest rates or property prices, as well as describing the differences between the approach and/or assumptions used under both Solvency I and under Solvency II for each component. This breakdown into components must be updated for most of the scenario runs; however, in some cases the breakdown only needs to be provided if the calculation of the overall TMTP requires recalculation of the individual components, otherwise the split into BEL and Risk Margin is sufficient.

Other Considerations

VOLATILITY ADJUSTMENT

The VA, unlike the MA, is not being tested for significant changes under the QIS exercise with the only changes in the VA being secondary impacts as a result of other changes in the individual runs.

The QIS instructions provide the VA for runs where the credit spread and downgrade sensitivities are applied. The VAs and stressed VAs are provided by currency, for some of the more common currencies seen in the market.

The amount of the VA only changes as a result of the use of SONIA-based risk-free rates and under the specified credit spread sensitivities. We note that the GBP VA changes from 11bps to 15bps at year-end 2020 due to the change to a SONIA based risk-free rates.

SCR RECALCULATION

The QIS instructions require participating firms to recalculate their SCR for all relevant runs—interest rate, spread widening and spread widening and downgrade runs.

The instructions also clarify that Internal Model firms should not make any adjustment to reflect the proposed FS designs.

Our Observations

In preparing this summary paper of the PRA's QIS exercise, Milliman consultants have made a number of observations and developed some key questions based upon the QIS Instructions. The following section outlines these observations and questions across the different topics we have covered in this paper.

RISK MARGIN - MOCE

As noted earlier, the specifications for the MOCE approach outlined by the PRA are similar to those defined under the ICS including the exclusion of market risks. One major difference, however, is that the PRA's specification uses the SCR for non-hedgeable risks as the 99.5th percentile while the ICS MOCE uses the life or non-life risk charge. Notably the latter are only in respect of underwriting risks and so no allowance is made in the ICS MOCE for counterparty or operational risks. This means that the MOCE calculated as part of Scenario A would likely be higher than the equivalent ICS MOCE under equivalent market conditions.

There are also items in the PRA's MOCE methodology for Scenario A which differ from the existing Solvency II Risk Margin calculation, namely that the PRA's MOCE methodology:

- Allows for the impact of the MA and the VA on the discount rate and subsequent impact on the non-hedgeable SCR. The current Solvency II Risk Margin must be calculated using a discount rate which does not allow for the MA or the VA.
- Presumes the business will continue on a going concern basis and cover both the existing business and future business expected to be written over the following twelve months. It is our understanding that many Standard Formula firms do not include twelve months of future new business in the existing Risk Margin calculation. Therefore, this requirement may present an issue for firms where they do not allow for this future new business in their calculations.

MATCHING ADJUSTMENT

Any eventual reforms around the MA are likely to include considerations regarding asset eligibility rules and the MA approval process—two areas which are often relevant to illiquid assets—alongside other reforms which are more technical in nature, such as the removal of the automatic restriction on the MA benefit that can be earned on sub-investment grade assets. However, these areas are not referenced in the QIS exercise, and we expect will be the focus of the questionnaire to be launched in early August.

Expected Loss

The PRA's proposal for Expected Loss may be an approach welcomed by firms, as it should not require any re-hypothecations

to determine the assigned portfolio of assets for the QIS. However, impacts from other changes proposed as part of the QIS exercise on the PRA's cashflow matching tests (such as the change of the risk-free rate to be SONIA-based) may require considerations for re-hypothecation.

Adjustment for Sovereign, Supranational and Quasi Government Exposures

There may exist sovereign, supranational and quasi government exposures which are not equivalent to government bonds (in which case they are likely treated similarly to corporate bonds), and the PRA's instructions for firms to set the FS similar to that under the current Solvency II framework will most likely be welcomed by firms as it should ensure consistency with the treatment of these assets at year-end 2020.

Credit Risk Premium

The methodology for the CRP would require firms to ensure the Z-spread be available for each asset in the MAP (Component A assets only); we would expect this to be case, as the Z-spread is a measure widely used in asset and investment management.

It is also worth mentioning that although in the QIS Instructions, the second component of the CRP refers to an index, this component is provided by the PRA.

In the current Solvency II framework, for a typical corporate bond, the equivalent of the CRP is given by the FS for corporate bonds:

$$FS \text{ corporate bonds} = \max(35\% \times LTAS, PD + CoD)$$

where the PD and Cost of Downgrade (**CoD**) varies by credit quality, sector and term, with the $35\% \times LTAS$ factor biting for the majority of these factors.¹² Simplistically, the difference between the proposed CRP and the current FS methodologies is the difference between 25% of Z-spread (with or without 25% of the five-year average spread component) and 35% of LTAS.

Valuation Uncertainty

The reference to the IFRS fair value hierarchy under the VU is a new area for the FS, and we believe it would benefit firms to ensure that the mapping of assets in the MAP to the IFRS fair value hierarchy is approved internally in time for completing the QIS exercise. This is also the first time, as far as we are aware, that an IFRS input has been included in the Solvency II calculations.

Effective Value Test for Lifetime Mortgages/ERMs

We note that the QIS instructions make no reference to the Effective Value Test, as defined in *SS3/17 Solvency II: Illiquid unrated assets*, and the (minimum) deferment rate parameter that

¹² See Monthly technical documentation for December 2020, available [here](#).

underpins it. The minimum deferment rate parameter is monitored by the PRA with reference to real interest rates.

Participating firms with exposure to equity release mortgages (**ERMs**) may wish to seek clarification from the PRA regarding whether the deferment rate parameters used in the Effective Value Test (**EVT**) are subject to interest rates stresses as part of the QIS.

CREDIT SPREAD AND DOWNGRADE SENSITIVITY

We note there are no references in the QIS instructions to credit spread stresses being applied to sovereign, supranational or quasi government bonds. We also note that there could be practical aspects to consider in the 'extreme spread widening and downgrade' sensitivity (e.g. simplifications for downgrading individual assets). Firms may wish to discuss their approaches and simplifications with the PRA.

LIBOR TO SONIA TRANSITION

For firms with approval to use the TMTP, the TMTP recalculated in Run ID 2 should be consistent with the principle applied by the PRA in PS 12/21. We do not believe that it is clear, as part of the QIS exercise, to what extent insurers are required to allow for other consequent impacts, such as basis risk, within their (partial) internal models following the transition to a SONIA-referenced RFR curve. If the approach taken by insurers varies under the QIS, this may become a possible limitation of the QIS results due to the lack of comparability. However, given that we are very close to the actual transition date, i.e. 31 July 2021, as set out by the PRA, it is our expectation that many firms should already have a view or plan for the SCR calculation after transition to SONIA. Hence, where appropriate and possible, firms may attempt to allow for some impact on their SCR calculation in order to provide a more realistic view of the solvency position as a result of moving to a SONIA-referenced RFR curve.

As a result of using the lower SONIA-based RFR curve for GBP compared to the LIBOR-based curve, the total spread of assets in the MAP, relative to the RFR curve, will become larger making the MA a more significant component on some firms' balance sheets. This may have certain knock-on impacts on insurers when assessing alternative approaches proposed by the PRA, as part of Scenarios A and B. In particular, this may impact the calibration of the FS for Component A assets within the MA portfolio.

TMTP

We note that as the TMTP is being recalculated as at year-end 2020 for Run 1 and then is required to be recalculated again for each of the scenario runs. The impact on technical provisions from some of the scenarios would be negated by a corresponding

impact to the TMTP, therefore the technical provisions after allowing for the impact of TMTPs may be unchanged/reduced.

Recalculating the TMTP is not always a straightforward process for firms and consequently the requirement to recalculate the TMTP across a number of runs could prove one of the more onerous and time-consuming components for firms taking part in the QIS exercise. This topic was flagged in a number of responses to HMT's Call for Evidence on the UK review of Solvency II where firms noted that the current process for recalculating the TMTP was excessively long, complex and time-consuming.

Firms may also have recently undertaken, or be part way through, a recalculation of their TMTP as at 30 June 2021 to make an allowance for the transition from LIBOR to SONIA. This is an additional recalculation allowed by the PRA¹³ due to other recent movement in interest rates. Moreover, this optional recalculation, and the required recalculations for a number of the QIS runs are in addition to the PRA's compulsory two-yearly recalculation of the TMTP, the next of which is due as at 31 December 2021.

SIMILAR REGULATORY LED MARKET RISK SENSITIVITIES

Firms participating in the QIS may wish to consider synergies with similar regulatory led market risk sensitivities, such as those required under *SS7/17 Solvency II: Data collection of market risk sensitivities*, which requires firms to submit results for a range of market risk sensitivities including changes to interest rates, credit spreads and downgrades. Market risk sensitivity results at year-end 2020 will likely have been submitted to the PRA by this time.

GOVERNANCE AND RISK MANAGEMENT

Building on experience from previous market-wide scenario tests, such as the Life Insurance Stress Test 2019, firms participating in the QIS may wish to consider a number of governance and risk management related aspects, such as:

- Documentation of basis and assumptions, including sign off from appropriate individuals and governing bodies within the organization. This could further include agreement with the PRA on the overall approach, along with any simplifications and limitations.
- Documentation of results, including obtaining sign off from the appropriate individuals and governing bodies. This could include sign off from any Board-level committee, benefiting firms to ensure results are understood, and that appropriate sign off is obtained in time for submission to the PRA.

The processes noted would be above the specified requirements to sense check all the results and have an appropriate individual under the SM&CR sign off on the results. The checking and sign

¹³ PRA statement on the recalculation of the TMTP

off of the results could be a significant task for firms, particularly those who are required to complete all 19 runs.

How Milliman Can Help

Participation in the Solvency II QIS is voluntary; however, it is expected that many companies will be keen to submit responses or at least to understand the potential impact any changes to the Solvency II regime may have on their balance sheets.

Milliman would be happy to discuss with firms how best to approach the QIS exercise and can offer a wide range of services to assist firms, including:

- Performing the QIS exercise, including:
 - Performing part or all of the exercise
 - Working on a consulting or seconded basis
 - Quantifying balance sheet impacts using Milliman's sample business portfolios
 - Reviewing the work carried out by the firm's internal teams
 - Sense checking results for consistency, and knock-on implications
- Providing "backfill" resource to free up team members to carry out the exercise
- Training on the changes covered in the QIS and other PRA publications, including to Boards and Senior Management
- Providing general support on the changes that may impact the firm more widely, including on:
 - Asset-liability matching
 - Reinsurance arrangements
 - Risk management
 - Cross-border arrangements

Please get in contact with your usual Milliman consultant if you wish to discuss further.

Appendix A – Overview of Required Runs

TABLE A.1 BASELINE RUNS OVERVIEW

RUN ID	Description	Risk free rates (RFR) used (all as at Year End 2020)	Government bond yields	Credit spreads & downgrades
0	Baseline information at year-end 2020	PRA RFR	No change	No change
1	TMTP recalculation	PRA RFR	No change	No change
2	Change from LIBOR to SONIA	SONIA	No change	No change
3	Rates up sensitivity	SONIA +200bps	+200bps	No change
4	'Moderate' spread sensitivity	SONIA	No change	'Moderate'
5	'Extreme' spread sensitivity	SONIA	No change	'Extreme'
6	'Extreme' spread and downgrade sensitivity	SONIA	No change	'Extreme' with downgrades

TABLE A.2 'SCENARIO A' RUNS OVERVIEW – RISK MARGIN CALCULATED USING MOCE APPROACH

RUN ID	Description	Risk free rates (RFR) used (all as at Year End 2020)	Government bond yields	Credit spreads & downgrades
7	Scenario A Baseline	SONIA	No change	No change
8	Rates up sensitivity	SONIA +200bps	+200bps	No change
9	Rates down sensitivity	SONIA -100bps	-100bps	No change
10	'Moderate' spread sensitivity	SONIA	No change	'Moderate'
11	'Extreme' spread sensitivity	SONIA	No change	'Extreme'
12	'Extreme' spread and downgrade sensitivity	SONIA	No change	'Extreme' with downgrades

TABLE A.3 'SCENARIO B' RUNS OVERVIEW – RISK MARGIN CALCULATED USING LAMBDA FACTOR APPROACH

RUN ID	Description	Risk free rates (RFR) used (all as at Year End 2020)	Government bond yields	Credit spreads & downgrades
13	Scenario B Baseline	SONIA	No change	No change
14	Rates up sensitivity	SONIA +200bps	+200bps	No change
15	Rates down sensitivity	SONIA -100bps	-100bps	No change
16	'Moderate' spread sensitivity	SONIA	No change	'Moderate'
17	'Extreme' spread sensitivity	SONIA	No change	'Extreme'
18	'Extreme' spread and downgrade sensitivity	SONIA	No change	'Extreme' with downgrades

Appendix B – Reporting Requirements

RUN ID	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
QIS TEMPLATE ITEM/SECTION																			
1. Solvency II balance sheet (S.02.01.01)																			
2. Own Funds (s.23.01.01)																			
3. Summary balance sheet ¹																			
4. Technical provisions																			
5. Risk margin																			
5.1 Basic Information																			
5.2 Capital requirements underlying MOCE								2			2	2	2						
5.3 (Net) Future undiscounted SCRs for risk margin																			
5.4 (Gross) Future undiscounted SCRs for risk margin																			
6. Ring-fenced funds and MA portfolios								2			2	2	2						
7. Matching adjustment																			
7.1 Additional information on MAPs (QRT SR.22.03.01)																			
7.2 Additional information on credit risk SCR																			
7.3 Detailed information on MAPs (separate template)																			
8. TMTP																			
8.1 Overall calculation of the TMTP (S.22.05.01)																			
8.2 Additional information on TMTP				3	3	3	3		3	3	3	3	3						
9. Long-term guarantees measures and transitionals (S.22.01.01)																			

NOTE 1:

No adjustment should be made to firms existing SCR models to reflect the Fundamental Spread design and calculation being tested in the base scenarios (runs 0-6) when running the calculations for Scenario A (Runs 7-12) and Scenario B (Runs 13-18).

NOTE 2:

Information to be provided both with and without application of the CRP caps.

NOTE 3:

The item is optional and only needs to be updated where the TMTP has been recalculated in order to complete the overall calculation reported in Section 8.1 of the QIS template.

Appendix C – Scenario Specifications

The table below outlines the specification for each run required by the QIS exercise and gives an indication to readers about how they might go about setting up the various runs. For example, [2]<[1] means that to set up run 2 take the run 1 set up and make the relevant change(s) indicated in the description column (in this case move to the SONIA-based RFR).

	Key item	Description	Baseline scenario	Scenario A	Scenario B	Other notes
Baseline Run Baseline Scenario	Year-end 2020 regulatory balance sheet	Reported year-end 2020 balance sheet	[0]			
	Year-end 2020 (notional) TMTP recalculation	Recalculation of TMTP	[1] < [0]			If TMTP recalculated at year-end 2020, then [1] = [0]
	Year-end 2020 SONIA	SONIA-based RFR	[2] < [1]			
Baseline Run Scenarios A and B	Risk Margin	MOCE approach		[7] < [2]		Discount at risk free plus MA / VA
		'Lambda factor' approach			[13] < [2]	Discount at risk free
	Matching Adjustment	25% of current Z-spreads		[7] < [2]	[13] < [2]	Caps and floors apply
		25% of average spreads		[7] < [2]		
		The higher Valuation Uncertainty		[7] < [2]		Applies to Level 2 and Level 3 assets (IFRS fair value hierarchy).
		The lower Valuation Uncertainty			[13] < [2]	
Sensitivities Runs All Scenarios	Interest Rate Sensitivities	SONIA (and government yields) +200bps	[3] < [2]	[8] < [7]	[14] < [13]	
		SONIA (and government yields) -100bps		[9] < [7]	[15] < [13]	
	Credit Sensitivities	Mild spread	[4] < [2]	[10] < [7]	[16] < [13]	
		Severe spread	[5] < [2]	[11] < [7]	[17] < [13]	
		Severe spread and downgrades	[6] < [2]	[12] < [7]	[18] < [13]	

Starting Run

Use the setup for Run 2 as the starting point to set up this run.

Use the setup for Run 7 as the starting point to set up this run.

Use the setup for Run 13 as the starting point to set up this run.



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