

Solvency II Reforms and the Prudential Regulation Authority's Quantitative Impact Study

14 February 2022



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Dear Charlotte

Pursuant to our Statement of Work with the Association of British Insurers (“ABI”), dated 5 November 2021, please find enclosed our report on the Solvency II reforms and the PRA QIS.

Attention is drawn to the distribution, reliances and limitations of our work, as set out in Section 4 of our report.

At your request, we consented to the publication of this report. For the avoidance of doubt, Towers Watson Limited (“WTW”, “we” or “us”) does not assume any responsibility, nor accept any duty of care or liability to any third party who may obtain access to a copy of this document; any reliance placed by such party is entirely at their own risk.

We remain available to answer the ABI’s questions that may arise regarding this document. We assume that the reader of this report will seek such explanation on any matter in question via the ABI.

Yours sincerely

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Purpose of this report

WTW is a leading global advisory, broking and solutions company providing data-driven, insight-led solutions in the areas of people, risk and capital.

This document was prepared by the UK insurance practice of WTW for the Association of British Insurers (“ABI”) to use in accordance with the terms of our Statement of Work dated 5 November 2021. This document must be considered in its entirety as individual sections may be misleading if considered in isolation.

This is an independent report prepared by WTW to demonstrate to policymaker and regulatory stakeholders the potential consequences of methodological choices being considered in the 2021 Quantitative Impact Study (“the QIS”) run by the Prudential Regulation Authority (“PRA”). This report contains, in the executive summary and Section 3, the views of WTW. As the QIS focusses on two aspects of review, the Matching Adjustment (“MA”) and Risk Margin (“RM”), so too naturally does our report.

We direct the reader to the Glossary for explanation on abbreviations and technical terms used in this document.

The report provides an explanation of the key challenges of the changes to UK insurance regulation explored in the QIS and summarises the outcomes for a subset of major UK insurers with significant life insurance business. Due to the nature of the PRA’s impact study, this report focuses on specific, technical aspects of the regime, most notably those with significant relevance to annuity providers. While the report does refer to other, more general aspects of the solvency regime, this is only in the context of changes resulting from the specific areas covered in the impact study. Our analysis is not exclusive to the implications for providers of annuities; however, the regulatory changes most clearly affect those firms that write long-term guarantees, such as annuities, so these are the focus in the report. We do not comment on the implications for providers of general (“non-life”) insurance.

Our report contains analyses of selected responses to the QIS from participating UK life and composite^a insurers, using data that covers approximately 75% of the UK life insurance market based on life and health technical provisions (excluding unit linked business). The results are presented in aggregate form only and do not represent the UK insurance market in total. Furthermore, the analysis does not cover the impacts on non-life insurance business. The results of our analysis should not be construed to represent the results of any one firm.

This document was prepared for use by persons technically competent in the areas addressed and with the necessary background information. This document was produced based on information available to us at, or prior to, 14 February 2022, and takes no account of developments after that date. WTW is under no obligation to update or correct inaccuracies which may become apparent in this report.

^a Organisations that write both life and non-life insurance.

Executive summary

Key WTW takeaways

The QIS framework does not satisfy the collective objectives of the HM Treasury review of Solvency II, as it would lead, if implemented, to material reductions in, and increasing volatility of, insurers' Own Funds, prioritising increased prudence to the detriment of competition and growth. The resulting reduced Own Funds and balance sheet volatility will create a more challenging environment for insurers to make long-term investment decisions and to write new long-term business. All else being equal, we would expect plans for future new long-term business volumes to downsize.

Rather than stimulate growth and investment in the UK, these changes could instead force UK insurers to transfer more risk off balance sheet and outside the UK to less onerous regimes. This will hinder, rather than stimulate, growth and investment in the UK, especially for infrastructure and long-term productive assets that the UK Government is keen for insurers to invest more in. The life insurance industry's position as a key long-term investor is much needed to support the growth of the UK economy and the Government's climate change and levelling-up agendas; key HM Treasury objectives of Solvency II reforms.

Higher and more volatile annuity prices could result in lower demand for such products and impact the broader pensions sector through higher protection levies on UK pension schemes, greater demand on employers for pension scheme funding (which is influenced by annuity prices), and an uptick in less secure non-insurance solutions for pension de-risking. This will ultimately lead to reduced income security for pensioners.

Background and introduction

The UK insurance industry is at an inflection point as reforms to its solvency regime are being considered in light of the UK's withdrawal from the European Union ("EU"). Now that it is no longer subject to an EU-harmonised Solvency II approach, the UK is free to tailor certain elements of the regime to the unique features of its insurance market.

HM Treasury has set out three key objectives for the reforms^a, which are in summary to:

- (1) Spur a vibrant, innovative and internationally competitive insurance sector
- (2) Protect policyholders and ensure the safety and soundness of firms
- (3) Support firms to provide long-term capital to drive growth consistent with the Government's climate change and productive finance objectives

An area of longstanding debate is the margin insurers hold to cover the potential costs of transferring insurance obligations to a third party should an insurer fail. This is known in regulation as the Risk Margin ("RM"). The size of this margin and the inherent interest rate sensitivity of the current approach has been a factor in the drive to reinsure UK longevity risks, often overseas to jurisdictions with less

^a HM Treasury, "[Solvency II Review: Call for Evidence](#)":

penal regulatory regimes. Industry and the PRA agree that the RM is too large and interest rate sensitive¹; the important question to be answered is how far will change on the RM go?

The element of regulation that is primarily intended to reflect that annuity writers are not exposed to short-term volatility, named the Matching Adjustment (“MA”), was a UK Government negotiated outcome for the UK during the development of Solvency II as EU regulation. The MA attempts to follow mechanisms available prior to Solvency II to enable a more appropriate treatment for business that has highly predictable cashflows and where the backing assets closely match the liabilities.

The MA is very important to UK insurers that invest for the long term – who are not subject to the same risks as those who need to buy and sell assets over short timeframes – and who look to new, innovative and higher yielding asset classes frequently focussed on the real economy to back their annuity business. In the COVID-19 crisis of April and May 2020, when credit spreads rose temporarily in the face of market overreaction, the MA worked as expected and shielded insurers and their customers from market dislocations resulting in relatively stable insurer balance sheets.

The PRA’s QIS

A quantitative and qualitative information gathering process has been conducted by the PRA. A summary of the QIS is provided in Section 1 and the QIS specification provided in Appendix B.

In this report we provide the results of our analysis of a representative subset of industry responses and our conclusions, based on our analysis of the QIS data, discussions with industry stakeholders and experience in the market. While the focus of the PRA QIS has been the RM and MA, we expect the Solvency II reforms to be broader than these two topics.

The QIS explored two scenarios of differing calibration strengths (Scenario A and Scenario B), and we received the QIS submissions from a sample of 16 firms to analyse. Our analysis shows that:

- The MA (for firms with approval to use it) would almost halve in Scenario A (a 44% reduction) and decrease by 13% under Scenario B, equating to an increase in annuity liabilities of £14.1 billion and £4.3 billion respectively.
- The RM for annuity business would reduce by 56% under Scenario A, while Scenario B would lead to a 21% reduction. The RM for non-annuity life business would reduce by 42% and 18% for Scenario A and Scenario B respectively.
- In aggregate, insurers’ funds available to withstand shocks, “Own Funds”, would reduce by 4.2% under Scenario A and by 1.0% under Scenario B, equating to £3.3 billion and £0.8 billion respectively among the firms for which we have data, making the exercise overall detrimental for the UK life insurance industry.
- For firms with MA portfolios, the average reduction in solvency ratio is 8% and 2% for Scenario A and Scenario B, respectively, based on holding the SCR constant across the scenarios.
- We see that for mono-line firms that specialise in annuities, the average solvency ratio drops by 31% and 11% under Scenario A and Scenario B respectively, again based on holding the SCR constant across scenarios and sensitivities.
- Under an “extreme spread” stress, as specified by the PRA, the MA under the QIS scenarios offset the spread movement by approximately 30% less than the current approach.

A significant limitation of the QIS data is the lack of information on how the capital that firms are required to hold might be impacted by the updated MA methodology which the PRA did not test through the QIS. Solvency capital implications of the scenarios have therefore not yet been analysed; however, for the sample at year-end 2020 the aggregate ratio of Own Funds to the capital required to be held is 145%. Without a corresponding reduction in required capital, the reductions in Own Funds would have possible implications for customer prices, firms' credit ratings, and their ability to raise capital. Any knock-on detrimental impacts on capital requirements would further impact the health and competitiveness of the UK insurance market.

Conclusions and the way forward

In summary, based upon our analysis of a significant subset of QIS submission data we conclude that:

For the Matching Adjustment

Before any revision is considered there should first be some objective analysis that demonstrates whether the current design presents any material deficiency at a total MAP level (i.e., including allowance for credit risk within the SCR) that would warrant reform.

PRA's apparent thinking on the MA is to use short-term signals from market prices as forward-looking indicators for changes in long term downgrade and default losses.² The tested QIS MA reforms re-examine perceived limitations in the existing framework from this one perspective, attempting to account for theoretical concerns about the market price sensitivity of the existing approach as expressed by the PRA.³ We see this approach as conflicting with the design objectives of the MA as described in Recital 31 of the Omnibus II Directive^a.

The PRA's cost benefit analysis within Consultation Paper CP16/14 Transposition of Solvency II Part III⁴ identified i) mitigating the impact of short-term market fluctuations; and ii) avoiding the need for complex and potentially costly derivative management as key benefits of the MA design as introduced by Omnibus II, recognising the risk management benefits of matching asset and liability cashflows. We agree that artificial balance sheet volatility is undesirable in a regulatory framework and that care is needed to avoid a regime that creates it especially at a time when spreads are at relatively low levels. The MA requires assessment of long-term expectations of default and downgrade costs over the lifetime of the asset. For this reason, the QIS approach does not clearly provide a suitable basis for setting an appropriate level of MA reflecting long term expectations.

The QIS also includes a Valuation Uncertainty ("VU") component in the credit loss allowance to reflect the difficulty in valuing assets on the basis that the PRA views this uncertainty as a retained risk.⁵ The VU is in effect a prudent margin added to best estimate ("an adjustment for assets which do not have market quoted prices, where the spread could be underestimated"). It is not clear why it is suitable to have a prudent deduction in the derivation of best estimate liabilities.

There is a need for increasing levels of engagement to develop an approach for the MA that better aligns to the review objectives (1) and (3) on international competitiveness and supporting firms as providers of long-term capital, and which is not to the detriment of objective (2) on policyholder protection and the safety and soundness of firms. This can be achieved through a focus on other

^a "Where insurance and reinsurance undertakings hold bonds or other assets with similar cash flow characteristics to maturity, they are not exposed to the risk of changing spreads on those assets. In order to avoid changes of asset spreads from impacting on the amount of own funds of those undertakings, they should be allowed to adjust the relevant risk-free interest rate term structure for the calculation of the best estimate in line with the spread movements of their assets."

areas such as asset eligibility, rather than unnecessarily making significant amendments to the approach for the calculation of the MA.

If it is decided revision is required, alternative, less severe reforms to the MA with more reasonable outcomes that avoid undesirable artificial volatility should be considered. For example, downgrades presently create a cliff edge for assumed credit losses. Smoothing the impact of downgrades through increased granularity of approach could be explored as a modification to lessen the cliff-edge nature of existing regime.

A successful approach would need to improve the dynamics of the current MA by making it more responsive to long-term and sustained changes ('signals') rather than responding to short term market movements ('noise') as observed in our analysis of the QIS approach. A successful approach would also need to suitably reflect the differing risk characteristics of real, long-term assets whilst retaining the investor reward for holding them.

For the Risk Margin

Given the RM "transfer value" principle set out in Solvency II, accurately measuring it using market activity data (other than through reinsurance transactions^a) is difficult if not impossible.

The percentile approach tested in Scenario A provides more material decreases for annuity business and mitigates the interest risk sensitivity which remains in the tested cost of capital approach in Scenario B, yet these benefits are overshadowed if a more extreme MA formulation is adopted alongside. Some annuity writers also express the view that the reduction (under either scenario) is not enough to remove the incentive to cede longevity risk and also that this risk is materially hedgeable so its contribution to the RM should be reduced.

A limitation of the percentile approach is that for short duration life business the RM can increase from current levels, an unintended consequence of using a pragmatic but simplistic single parametrisation with no variation by product set. A possible amendment to this would be to set the percentile more granularly, i.e. by differing product types. The tapered cost of capital approach could also give RM reductions across all durations and reduced interest rate sensitivity if the lambda factor was suitably decreased. It is the calibration of the chosen approaches that is the key issue.

A significantly reduced and less interest rate sensitive RM will support new long-term business written by UK insurers and result in lower premiums and greater security for customers. This is necessary for UK insurer competitiveness at a time when the European Commission ("EC") is proposing to support investment in Europe's recovery and an interim regime has been introduced for UK pensioners.

More widely

A more complete view is needed with respect to the resulting impact on required capital and volatility of required capital, lest unforeseen and unintended consequences emerge.

To satisfy the review objectives we believe a more holistic approach should go beyond the balance sheet alone and include governance, risk management and reporting considerations (the so called "Pillar 2" and "Pillar 3" aspects of the solvency framework). The QIS has naturally focussed on the level of insurer capital; however, some of the apparent concerns of the PRA are already addressed

^a We note that reinsurance transactions would by nature contain a margin for profit.

through risk management, governance and disclosures in Pillar 2 and Pillar 3, with a much lower level of cost and disruption to the industry.

We strongly support working together in a constructive dialogue between policymakers and industry that progresses development on these important areas.

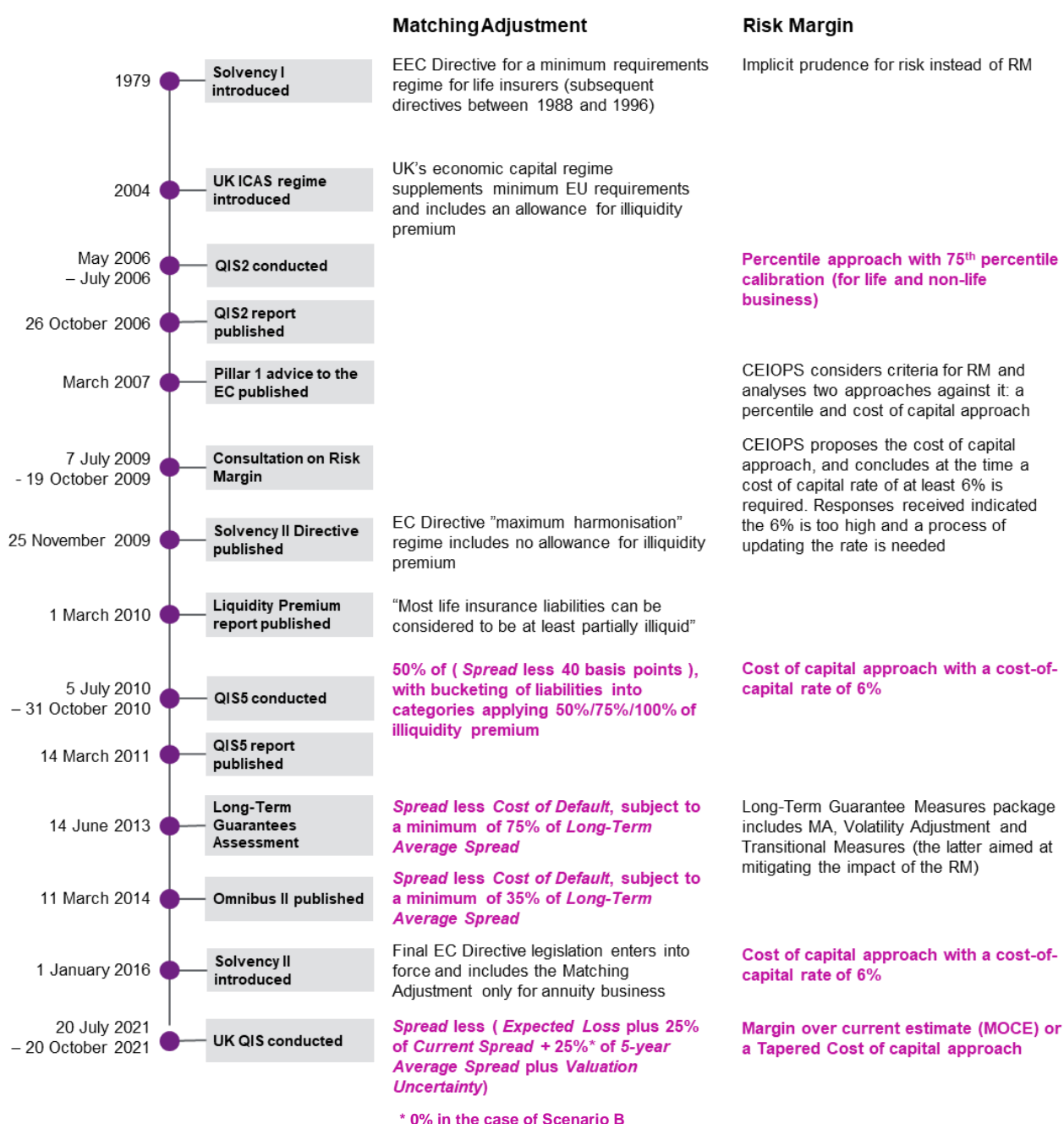
Section 1: Background

History of the regulatory regime

Figure 1.1 charts the development of the insurance solvency regime in the UK, including milestones related to key features of the prudential requirements: the Matching Adjustment (“MA”) and the Risk Margin (“RM”), as they came to be known under Solvency II.

We provide more detail on the regulatory developments highlighted in Figure 1.1. in Appendix A.

Figure 1.1: Timeline charting the development of the solvency regime as applicable to annuity providers and milestones in the development of the MA and RM



* 0% in the case of Scenario B

UK's withdrawal from the European Union

On 31 January 2020, following on a public vote held in June 2016, the UK formally left the EU. As a result, EU legislation as it applied to the UK prior to leaving the EU, became a part of UK domestic legislation, under the control of the UK's Parliaments and Assemblies.

The EU legislation was transferred onto the UK statute book by the European Union (Withdrawal) Act 2018 ("EUWA"). Under the "onshoring" programme, HM Treasury and the regulators undertook a significant programme to ensure that the body of retained EU law relating to financial services would operate effectively following withdrawal from the EU, by making the necessary amendments to address any deficiencies arising as a result of exit or the end of the transition period. As part of the onshoring programme, responsibility for making some types of delegated legislation was transferred to the regulators, but the majority of financial services regulation now sits on the UK statute book.

On 19 October 2020, HM Treasury embarked on the second phase of the Future Regulatory Framework ("FRF") Review⁶, which considers how the regulatory framework for financial services needs to adapt to be fit for the future. The subsequent FRF Review Proposals for Reform⁷ published in November 2021, states that the onshoring approach provided stability and continuity in the immediate period after EU withdrawal, but it was not designed to provide the optimal, long-term approach for UK regulation of financial services. HM Treasury's proposal is that the Prudential Regulation Authority ("PRA") and the Financial Conduct Authority ("FCA") will be responsible for designing and implementing the regulatory standards that apply to financial services firms and markets using rule-making powers in the Financial Services Markets Act 2000 ("FSMA 2000"). This will involve the transfer of regulatory requirements in onshored legislation to the regulators.

HM Treasury's proposals also set out that the government intends to provide for a greater focus on growth and international competitiveness by introducing new, statutory secondary objectives for the PRA and the FCA. In our view, for the PRA, the new objective would sit alongside its existing secondary objective to facilitate effective competition in the markets for services provided by PRA-authorized persons.

Review of Solvency II

Released simultaneously with the FRF Review on 19 October 2020, HM Treasury's Call for Evidence kicked off the activities to review and re-shape the UK's insurance regulatory regime following its withdrawal from the EU. This followed the Treasury Committee's 2016 call for evidence on Solvency II in light of Brexit.

The three objectives stated as underpinning the HM Treasury review are:

- To spur a vibrant, innovative and internationally competitive insurance sector;
- To protect policyholders and ensure the safety and soundness of firms; and
- To support insurance firms to provide long-term capital to underpin growth, including investment in infrastructure, venture capital and growth equity, and other long-term productive assets, as well as investment consistent with the Government's climate change objectives.⁸

The second of HM Treasury's three objectives is the same primary objective that is held by the PRA in its supervision of insurance firms. The two others are not primary objectives of the PRA, although the Governor of the Bank of England, Andrew Bailey, has indicated growth in the economy will enhance the primary objectives.⁹

The topics covered in the Call for Evidence were wide-ranging and included specific questions on the RM and MA, which for the latter included eligibility of assets for the MA, its calculation and approval process, climate change risks and infrastructure investment and managing risks within the MA.

Overall, HM Treasury's Call for Evidence received 64 written responses¹⁰ in addition to a number of bilateral meetings with stakeholders. WTW was one of the respondents to HM Treasury's Call for Evidence and our public response is available online.¹¹

Notably, on 22 September 2021, the European Commission proposed a comprehensive review package for EU insurers and reinsurers to promote their investment in the economy and meet the EU's political priorities. This initiative is expected to release up to EUR 90 billion of insurer capital in the short term.¹²

HM Treasury's Call for Evidence alluded to potential technical consultations by the PRA and a "comprehensive package of reforms" for consultation in early-2022.

Quantitative Impact Study ("QIS")

On 20 July 2021, the PRA launched a QIS and subsequently, on 13 August 2021, a qualitative questionnaire, with responses due by 20 October 2021.

A more detailed summary of the QIS is provided in Appendix B.

The QIS focuses on the following three key areas, on which the PRA has gathered a large volume of granular data to carry out its own modelling and which we address in Section 3:

1. Risk Margin: two different approaches have been tested – a percentile-based approach identical to the Margin Over Current Estimate ("MOCE") used under the Insurance Capital Standard ("ICS") and the other following a cost of capital approach (the "lambda" or "tapering" approach) similar to the existing approach but returning a lower value with less sensitivity to future interest rates.^a
2. Matching Adjustment: an approach is being tested using a proportion of the current spreads on the assets plus the average five-year historical spreads alongside the percentile-based RM approach and another scenario (which drops the five-year average spreads from the calculation) alongside the tapered cost of capital RM.
3. Transitional Measures on Technical Provisions ("TMTPs"): a recalculation of TMTPs at the valuation date is requested alongside switching to the Sterling Overnight Index Average

^a As previously mentioned, the EC has proposed a review package which contains an alternative tapering approach with a lower cost of capital rate and no floor on the cumulative taper.

(“SONIA”) curve for the basic risk-free rate instead of the London Interbank Offered Rate (“LIBOR”).

Impacts on SCR were not tested as part of the QIS.^a Changes in the RM and MA will likely impact capital requirements. While there are no changes to Standard Formula (which is used to calculate the Solvency Capital Requirement (“SCR”) by firms who do not have an approved internal model) Charlotte Gerken, Executive Director at the Bank of England, gave a speech¹³ within the QIS submission period that indicated that a review of the Standard Formula would take place at a subsequent stage.

Gareth Truran, Director of Prudential Policy at the Bank of England, gave a speech¹⁴ less than a month before the QIS submission deadline. The speech described how the regulator will use the QIS exercise as an opportunity to draw on the extensive data being provided to assess a wide range of potential policy options from which a reform package will be chosen and consulted upon. At the time of writing the qualitative measures that form the rest of the package remain unknown, so consideration cannot yet be given to this.

Our report on Solvency II reforms and the QIS

This report covers the elements of the insurance regulatory regime which have been in the spotlight for the 2021 QIS, namely the MA and RM (including the impacts of TMTP).

The report contains the following sections:

- Section 2 provides our analysis of the QIS data to which we have access, using the responses provided by a selection of participating life insurers.
- Section 3 contains our conclusions, based on our analysis of the QIS data, discussions with industry stakeholders and experience in the market.
- Section 4 includes the terms of distribution of this report and its reliances and limitations.
- Appendix A covering more detail on the regulatory background pertaining to MA and RM.
- Appendix B covering more of the details on the PRA QIS.
- Appendix C covering the MA, which sets out:
 - An introduction to the MA, including its rationale and importance in the UK market,
 - A description of the current approach to the MA and the methodology and calibrations being explored in the QIS, and
 - An analysis of the performance of the current approach and the QIS approach under selected scenarios. We use an illustrative MA portfolio to make assessments which we have validated using firms’ QIS submission data in Section 2.
- Appendix D covering the RM, which sets out:

^a Impacts on solvency are not being sought in the quantitative part of the exercise but are covered in the qualitative questionnaire.

- An introduction to the RM, including its rationale and impact,
 - A description of the current approach to the RM and the approaches being explored in the QIS, and
 - An assessment of the calibration of the current approach relative to the QIS approaches and alternative calibrations. We use illustrative liability portfolios to make assessments which we have validated using firms' QIS submission data in Section 2.
- The References and Glossary sections at the end of this report provide a means to look up the cited materials and to understand the terms that we have used.

Section 2: Analysis of quantitative and qualitative data

Overview

There are two parts to the data request that the PRA made to UK insurers.¹⁵

- A quantitative section (the QIS) which was released on 20 July 2021, and
- A qualitative questionnaire (“QQ”) released on 13 August 2021.

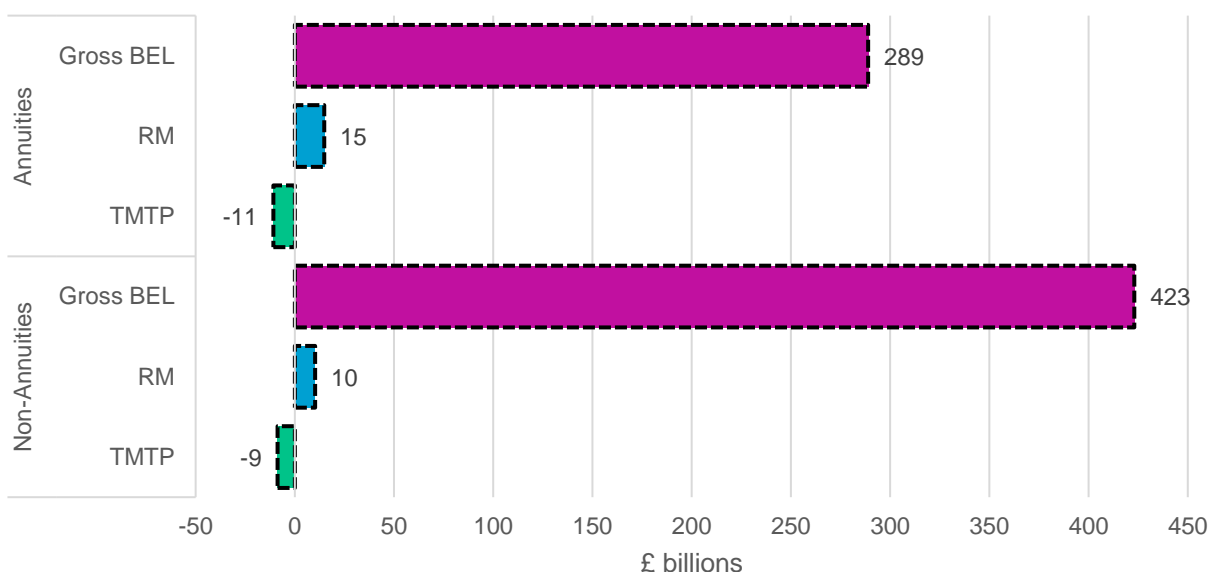
Responses to both parts were due by 20 October 2021.

The QIS compares the balance sheet of an insurer from a baseline scenario to Scenario A and Scenario B with the basic risk-free rate transitioning from being based on LIBOR to being based on SONIA in the baseline (Scenario A and Scenario B are only ever SONIA-based). Sensitivities under the scenarios are requested for shifts in yield curves and widening credit spreads and downgrades.

The QQ covers a broader analysis of areas for reform such as gathering information on proposals to make the regime more streamlined and/or flexible, to understand business impacts of potential policy options and to understand cost of complying with the current regime and the potential design options.

Our analysis covers the quantitative data of 16 UK insurance companies, 11 of which hold one or more approved MA portfolios and 12 use TMTPs. We also reviewed the qualitative information provided by 12 of these firms. Figure 2.1 provides a breakdown of the total liabilities in our QIS data.

Figure 2.1: Total liabilities covered by the QIS analysis split by annuity and non-annuity business at year-end 2020 position



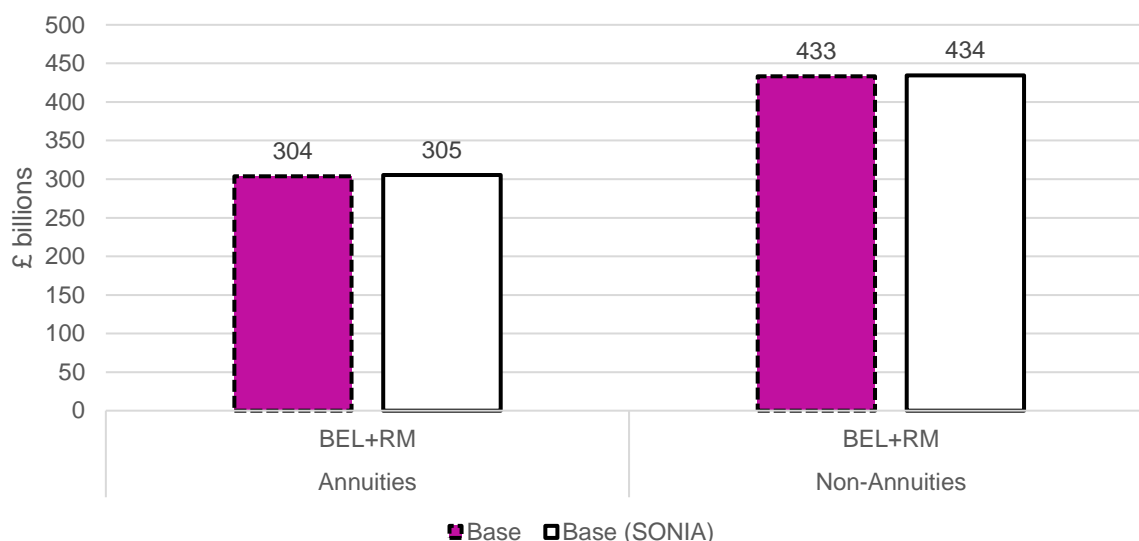
The total annuity BEL plus RM net of TMTP of £293 billion represents approximately three quarters of total annuity technical provisions^a. We estimate that the QIS data we received for the total life and health business (excluding unit linked business), totalling £530 billion, represents over three-quarters of the total industry as at year-end 2020.¹⁶

Quantitative responses

Transition to SONIA

The QIS requested that firms provide results on the assumption that a SONIA-based basic risk-free rate curve had been effective as at year-end 2020. Figure 2.2 shows the impact on the technical provisions caused by the transition to the SONIA-based interest rates.

Figure 2.2: Technical provisions^b under year-end 2020 discount rates and on transition to using SONIA-based year-end 2020 basic risk-free rates



The SONIA-based rates are approximately 15 basis points lower than those based on LIBOR.

The impact of the interest rate transition is limited for both the annuity and non-annuity business. For the annuity business, we would expect limited impact as a result of the absorbing effect of the current MA (which we will come to again in the economic sensitivities). We also note that there is some further offset provided by the recalculation of TMTPs (by approximately £1 billion for each of the annuity and non-annuity business, as indicated by the QIS results). The total changes in Figure 2.2 mask more significant step ups in BEL among individual firms, particularly among writers of non-annuity business.

The SONIA-based basic risk-free rates are used for the two scenarios and all of the economic sensitivities in the QIS, so this result provides the baseline of comparison from here onwards.

^a Based on the £373 billion in annuity technical provisions reported by firms at year-end 2019 per the KPMG-ABI Report.

^b Technical provisions does not consider any offsetting TMTP

Matching Adjustment

The MA portfolios in our sample have a total risk-free BEL of £285 billion and a surplus of £11 billion under the SONIA scenario. The average duration of liabilities (weighted by BEL) in the MA portfolios is 12.8 years.

In aggregate, the annuity BEL held by firms in our sample rose by 4.9% under Scenario A and 1.5% under Scenario B, representing increases of £14 billion and £4 billion, respectively.

In Figure 2.3 we present the breakdown of MA portfolio spread by FS and MA. The figures in this chart use weighted averages where the weights are BEL multiplied by duration. The Scenario A FS uses the uncapped CRP here (there is little difference between capped and uncapped when credit spreads are unstressed – the capped version returns an average MA that is approximately 2 basis points higher).

Figure 2.3: Weighted average FS and MA under SONIA base, Scenario A and Scenario B^a

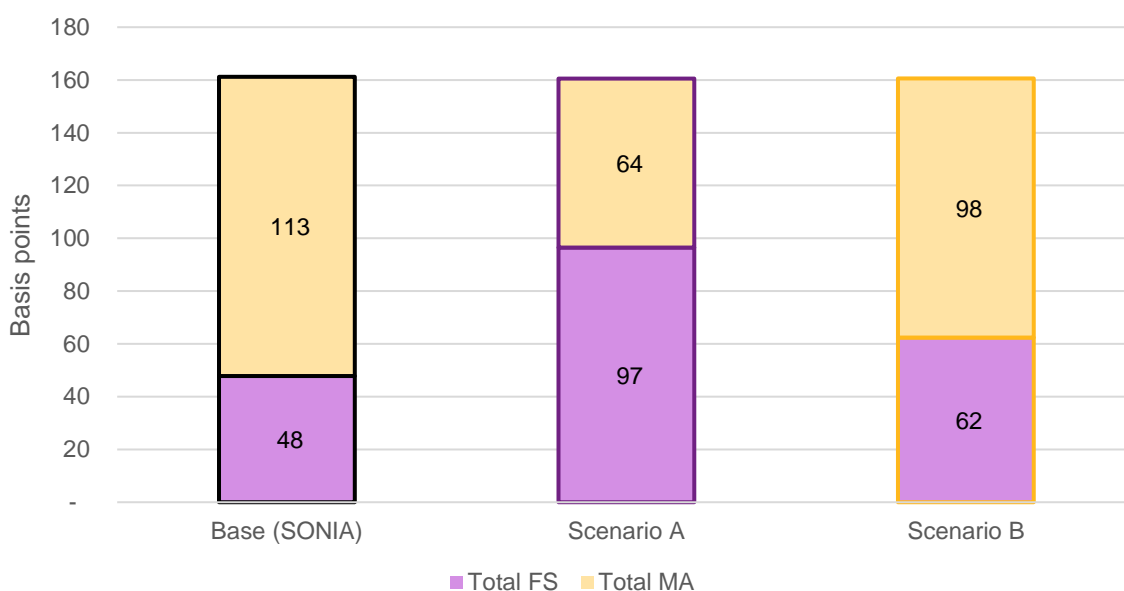


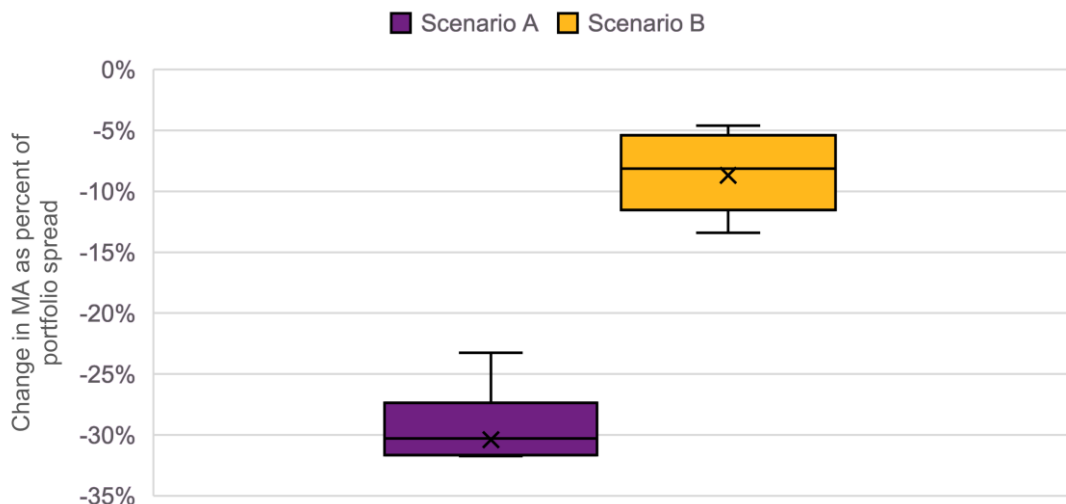
Figure 2.3 shows that the FS approximately doubles under Scenario A and increases by around 30% in Scenario B, with commensurate reductions in the MA. The MA reduces from a weighted average of 113 basis points under the baseline to 64 basis points in Scenario A and 98 basis points under Scenario B. These results bear a very close resemblance to those we estimate using our own analysis in Table C.3. The expected default loss (the PD element of FS) remains unchanged as the QIS approach in Scenario A and B retains this element in the calculation. The difference is mostly attributed to the difference in the biting LTAS floor in the SONIA scenario versus the CRP in the two scenarios.

The distribution of the relative reduction in the MA as a proportion of MA portfolio spread is shown in Figure 2.4. below. The box and whisker plot below shows the interquartile range (the box marks the range between the 25th and 75th percentiles) and full range (horizontal bars indicate maximum and

^a The average FS and MA are weighted by BEL multiplied by duration

minimum values), the median (bar within the interquartile range representing the 50th percentile) and the mean (the cross) for all companies included in our analysis.

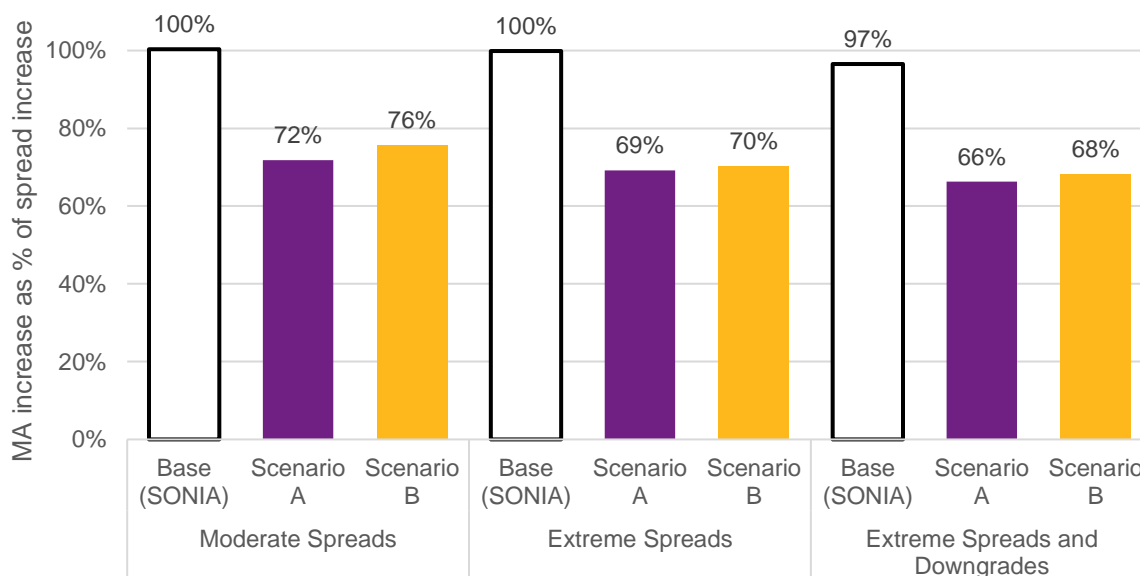
Figure 2.4: Distribution of MA changes as percentage of MA portfolio spread under Scenario A and Scenario B relative to the SONIA base



As Scenario A assumes a larger Valuation Uncertainty component and includes an additional 25% of five-year average spreads for the CRP compared to Scenario B, the FS is consequently more onerous and the MA is lower for all firms when compared to Scenario B.

The chart below shows the MA offset (MA increase as a percentage of spread increase) for the spread widening scenarios included in the QIS. Here “Base (SONIA)” reflects the move in the current MA (reset to use the SONIA-based basic risk-free rate) under these economic sensitivities.

Figure 2.5: Change in MA offset for SONIA base, Scenario A and Scenario B under the economic sensitivities



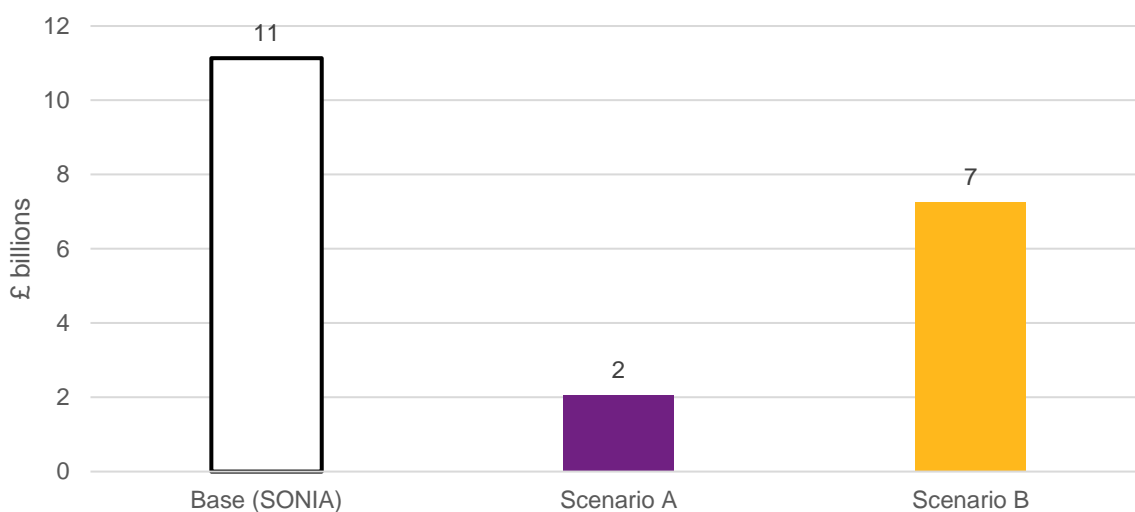
The MA benefit as a proportion of spreads drops substantially under the spread widening and downgrade sensitivities for the Scenario A approach and, to a slightly lesser extent, the Scenario B approach. These drops represent significant proportions of the weighted average portfolio spread changes under the economic sensitivities. As the current approach is designed not to react to spread movements, there is limited to no impact on the MA for the base results under the economic sensitivities.

The results here validate the estimated results using our own analysis in Figure C.4. We note that the results in Figure C.4 allow for changes in the five-year average spreads due to the spread shocks and hence show greater variation between Scenario A (which includes the five-year average) and Scenario B (which does not include the five-year average). For the QIS exercise the five-year average spreads were assumed to remain unchanged in the sensitivities.

The results above used the uncapped CRP for Scenario A. For Scenario A applying the cap, the MA under the extreme stress is 44 basis points higher than the uncapped version and the MA offset is 85% (compared to 69% in the case without cap). The MA offset for the moderate spread widening and extreme spread widening with downgrades sensitivities is 80% in both cases.

Total MA surplus at year-end 2020 – which represents the market value of assets that are held in excess of those used to match the MA BEL (and is also known as “Component C”) – is shown in Figure 2.6.

Figure 2.6: Total MA surplus under SONIA base, Scenario A and Scenario B



From Figure 2.6 we can see that if all firms were to attempt to maintain MA surplus at levels similar to current (as the submissions for some firms indicated they did) then this would require a substantial injection of assets to the value of £9 billion in Scenario A and £4 billion in Scenario B which would further dilute the MA and reduce Own Funds relative to the QIS results submitted. The QIS results may therefore underestimate the true impact of managing the balance sheet under the QIS Scenarios.

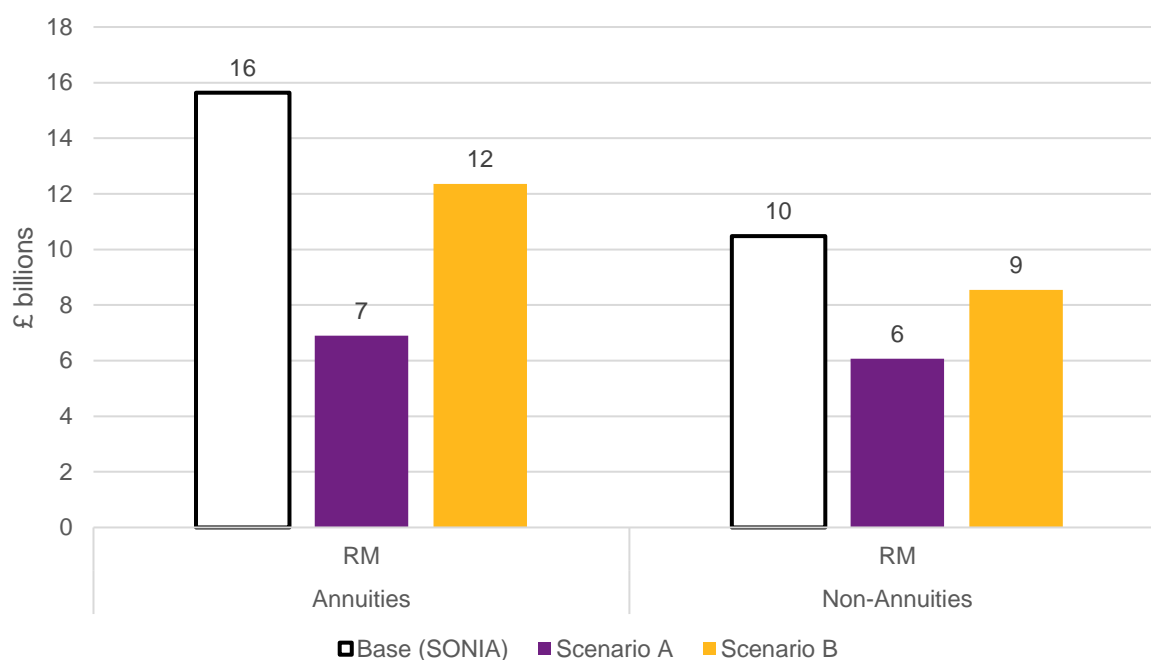
We note further that two firms have not restored any level of MA surplus when it becomes nil or negative under the scenarios, and the surpluses for these firms are included in the totals. This is

perhaps not a valid representation and may understate the impact of the scenarios. Assets would either need to be injected into the MA portfolio or liabilities taken out the MA portfolio to restore a suitable level of surplus which will further dilute the MA benefit. There would also likely be challenges as firms sought to restore their MA surplus at the same time with increased competition for the same assets.

Risk Margin

For the annuity business, total RM represents 5.1% of the total gross BEL in the base scenario. The proportion is 2.4% for the non-annuity business. Figure 2.7 shows how the RM changes under the percentile-based approach (Scenario A) and the tapered cost of capital approach (Scenario B).

Figure 2.7: Total RM under SONIA base, Scenario A and Scenario B for annuity and non-annuity business

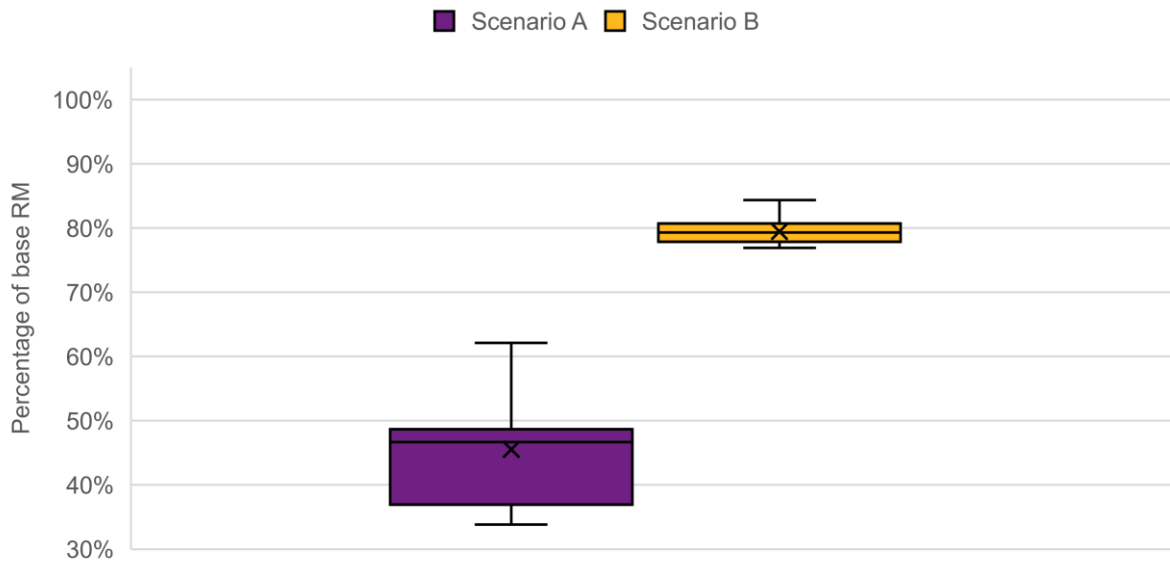


For annuities, Scenario A leads to a 56% reduction in the RM, while Scenario B leads to a 21% reduction. For non-annuities, the reductions are 42% and 18% for Scenario A and Scenario B respectively. The annuity results confirm the estimated results we produced using our own analysis in Table D.2.

We were also able to use the QIS results to determine the RM under the European Commission's proposed formulation. The EC's method sets the cost of capital rate to 5% and removes the cumulative floor of 50%. Based on firms in our sample, the total decrease in RM implied by the EC changes is 34% relative to the current RM and 17% relative to the RM under the Scenario B approach. Reducing the lambda factor (and also removing the cumulative floor) from 97.5% to 85% results in a decrease in the RM of 61%.

The box and whisker plot of the distribution of RM change for annuity business is shown in Figure 2.8.

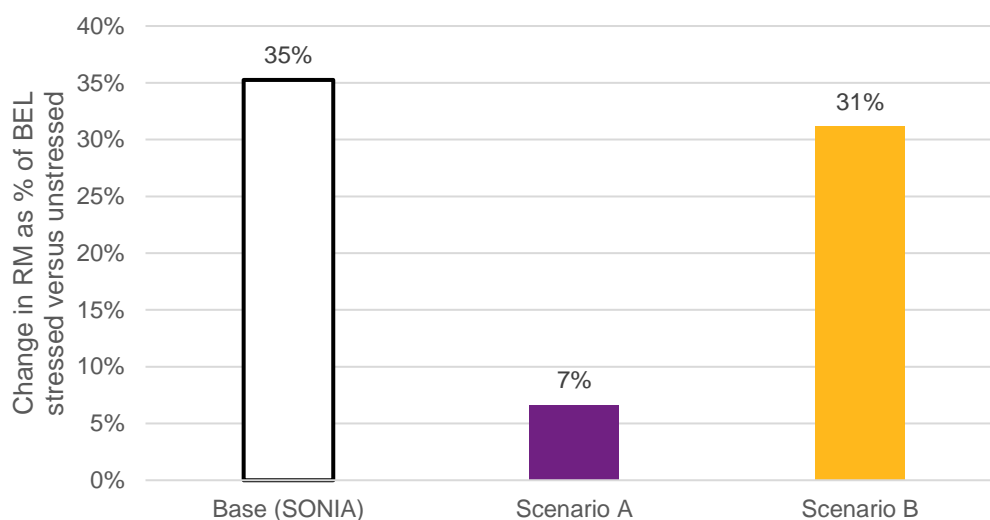
Figure 2.8: Distribution of RM as a percentage of SONIA base RM under Scenario A and Scenario B for annuity business only



For annuity business, the median RM under Scenario A is 46% of the current amount, while the Scenario B median is 79%. For non-annuity business, the median is 66% and 82% for Scenario A and Scenario B, respectively.

Figure 2.9 shows how the RM for life business changes under the base, Scenario A and Scenario B for a parallel upwards movement in the basic risk-free curve of 200 basis points compared to the unstressed RM.

Figure 2.9: Change in RM as % of BEL stressed versus unstressed under SONIA base, Scenario A and Scenario B for a parallel movement in the basic risk-free curve of +200bps for annuities only



The RM approach in Scenario A is significantly less interest rate sensitive compared to the base (current approach) and the Scenario B approach. Scenario B shows less sensitivity than the current approach but the difference is marginal.

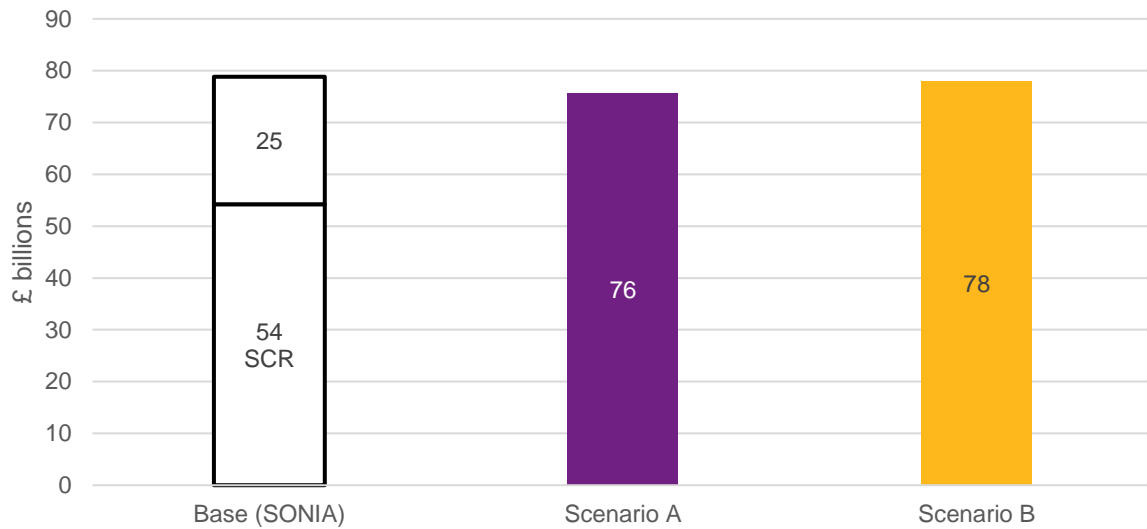
We also examined movement in the absolute level of RM under the interest rate sensitivity and behaviour of the RM under the credit sensitivities. The Scenario A approach exhibits sensitivity to credit spread movements whereas the Scenario B approach in comparison has a very limited reaction.

Impact on total balance sheet

Own Funds amounts are provided in the QIS results that show the aggregate impact of the scenarios on the assets available to meet regulatory capital requirements. Quantitative SCR data was not requested in the QIS for the scenarios so changes in the solvency ratio (Own Funds / SCR) cannot be directly discerned from the data.

Figure 2.10 shows the total Own Funds of all the companies in our sample under the base, Scenario A and Scenario B.

Figure 2.10: Own Funds (showing SCR portion of Own Funds in SONIA base) under SONIA base, Scenario A and Scenario B

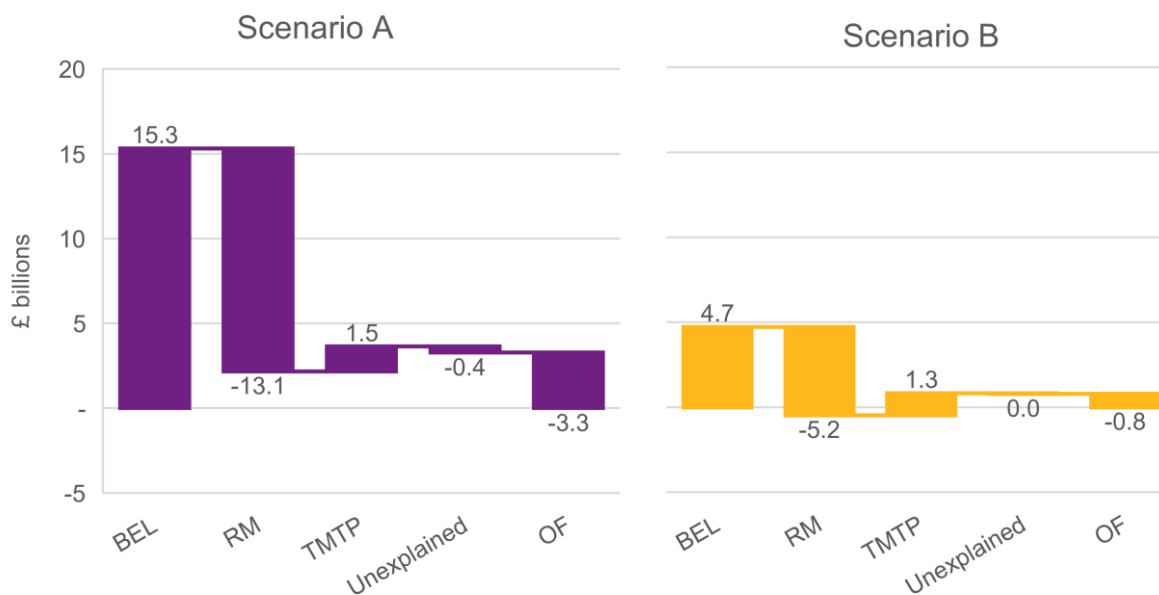


The Own Funds under Scenario A reduce by 4.2% and under Scenario B the reduction is 1.0%. Solvency capital implications have not been explored as part of the QIS exercise; however, the solvency ratio of the sample at year-end 2020 is 145%. Unless there was a corresponding reduction in SCR, these reductions in Own Funds would significantly impair the capital ratios of UK insurers unless there was a corresponding reduction in SCRs.

For firms with MA portfolios only, the drop in solvency ratio is 8% and 2% for Scenario A and Scenario B, respectively, based on holding the SCR constant across scenarios and sensitivities. We see that for firms that specialise in annuities, the average solvency ratio drops by 31% and 11% under Scenario A and Scenario B respectively, again based on holding the SCR constant across scenarios and sensitivities. The situation is exacerbated considering that SCR could be expected to increase given it could be expected that the loss of MA absorbency seen in base might translate into increased credit capital if the stress approach follows the base, as is typically good practice. Alternatively, it might also be viewed that more allowance for unexpected credit losses is allowed for the base MA and therefore the SCR should be reduced.

In Figure 2.11 we show the overall changes for all life and health business under the scenarios broken down by BEL, RM, TMTP and Own Funds ("OF"). An "Unexplained" item is included that accounts for the differences in the Own Funds movement that is not attributable to BEL, RM and TMTPs.

Figure 2.11: Change in BEL, RM, TMTP and Own Funds relative to SONIA base under Scenario A and Scenario B



Under the base scenario, the majority of the TMTP relates to the RM (over 80%, of the TMTP before application of the Financial Resources Requirement (“FRR”) cap). However, under Scenario A this reduces to around 45% but is offset by TMTP relating to the difference between the MA and Solvency I illiquidity premium. This is similar in Scenario B, except that the RM component of TMTP is approximately 70%.

The BEL, RM and TMTP movements account for the vast majority of the change in Own Funds. Unexplained movements are limited and expected to relate to elements of the business outside of life insurance.

Qualitative responses

In this section we summarise the industry responses. To be clear, we do not provide any WTW house view on these responses within this section and do not necessarily support or agree with the responses.

Instead, we have summarised the key themes from the responses. WTW views are provided within Section 3, “WTW view on the Solvency II review and QIS”. For some sections of the QQ there were fairly limited responses. We note that views of individual firms may not always represent views of the industry in general.

Responses to key questions from the QQ can be broadly categorised into the following:

- Firms’ perceived benefits and downsides of the QIS design, summarised in Table 2.1.

For the MA, a summary is provided for responses from questions 11a and 11b of the “MA FS Calculation” section of the QQ and, for the RM, a summary is provided for responses from questions 4,5,8 and 9 of the “Risk Margin” section of the QQ.

There was a clear consensus among participants against the QIS MA design, while responses in regard to the RM design were more varied, and firm-specific.

- Firms’ views on the wider business impacts of the QIS designs if made reality, summarised in Table 2.2.

The quantitative data in this section is limited to the firms that provided this in the QQ responses sent to us.

- Firms’ suggestions to improve the regulatory framework, summarised in Table 2.3.

Suggestions provided by firms on the MA design focussed on process streamlining, MA eligibility and FS granularity.

Table 2.1: Summarised benefits and downsides of the QIS approaches as provided in responses to the QQ

Area	Benefits	Downsides
Matching Adjustment, Scenarios A & B	<p><i>Firms indicated minimal benefits of the QIS design under both Scenario A and Scenario B:</i></p> <ul style="list-style-type: none"> ■ <i>Two firms indicated that the expected loss component (the PD element) provides continuity from the current MA provided it represents a best estimate.</i> 	<p><i>There were several consistent themes among firms, which included:</i></p> <ul style="list-style-type: none"> ■ <i>The introduction of procyclicality resulting in a more volatile balance sheet that is sensitive to credit spread movements and difficult to hedge, which could lead to more frequent MA test breaches.</i> ■ <i>The Valuation Uncertainty adjustment being inappropriate for the best estimate which could lead to double counting. Firms expressed a preference that it be considered in the context of capital items.</i> ■ <i>That there are high penalties for illiquid assets (even where strong security packages are in place), such as infrastructure, which conflicts with the aim of the review to encourage investment in this.</i> ■ <i>That the impact on SCR is not explicitly considered in the QIS.</i>
Risk Margin, Scenario A Percentile approach	<p><i>Consistent themes among respondents, include:</i></p> <ul style="list-style-type: none"> ■ <i>Simpler calculation method (avoiding the need to project SCR through time). This reduces operational complexity and cost.</i> ■ <i>The impact of the MA and VA is included, which better reflects the profile of lines of business where this is applicable.</i> ■ <i>Reduction in the size of the RM in general (but not for all firms under Scenario A).</i> ■ <i>Sensitivity to interest rates is reduced, however, the level of reduction in the RM under this approach is not great enough to remove sensitivity to interest rates.</i> 	<p><i>Consistent themes among respondents, include:</i></p> <ul style="list-style-type: none"> ■ <i>Commentary that the RM reduction was modest, due to using 85th percentile for the calibration, and would continue to remain a material balance sheet item.</i> ■ <i>That the reduction was not enough to remove the incentive for annuity market participants to cede longevity risk. Furthermore, firms argued that longevity is in reality a materially hedgeable risk and so its contribution to non-hedgeable SCR should be reduced.</i> ■ <i>That the overall impact (i.e. including the MA effect) of Scenario A is detrimental for firms' solvency ratios in comparison to the current regime.</i> ■ <i>One firm commented that the impact is dependent on duration of company's liabilities, with shorter duration contracts penalised and that any reform of the RM should be more equitable between firms</i>

Area	Benefits	Downsides
		<p><i>rather than inadvertently leading to winners and losers, which could result in unintended consequences within the industry.</i></p> <ul style="list-style-type: none"> ■ <i>A firm also noted that as the percentile approach represented a significant divergence away from the existing RM methodology, there was a risk that such a move would threaten Solvency II Equivalence.</i>
<p>Risk Margin, Scenario B Tapered cost of capital approach</p>	<p><i>Consistent themes among respondents, include:</i></p> <ul style="list-style-type: none"> ■ <i>That the tapered cost of capital approach is very similar to the current calculation, so would be relatively straightforward to implement.</i> ■ <i>That the tapered cost of capital approach is more consistent with proposal considered by EIOPA, more likely to support EU Solvency II Equivalence.</i> ■ <i>Reduction in the size of the RM, albeit in general more modest than under Scenario A.</i> ■ <i>Sensitivity to interest rates is somewhat reduced, but not as much as under the Scenario A approach.</i> 	<p><i>Consistent themes among respondents, include:</i></p> <ul style="list-style-type: none"> ■ <i>Similar to the comments on the percentile approach, firms noted that the RM reduction was modest, lower than the Scenario A equivalent and would result in the RM continuing to remain a material balance sheet item.</i> ■ <i>Again, that the reduction would not be enough to remove the incentive for annuity market participants to cede longevity risk.</i> ■ <i>The impact of the tapered cost of capital approach is dependent on the value of the lambda factor, which appears arbitrary and difficult to justify.</i> ■ <i>One firm also commented that there is a lack of clarity as to whether this approach would impact firms' SCR run-off patterns.</i>

Table 2.2: Summarised wider business implication of the QIS approaches as provided in responses to the QQ

Area of concern	Key themes from firms' responses to QQ
<p>Cost of implementation</p> <p>Questions 3– 8 under “MA FS Calculation”</p> <p>Questions 2,3,6 and 7 under “Risk Margin”</p>	<p>The QQ asks firms about the expected implementation and maintenance costs of the MA and RM under Scenarios A and B.</p> <p>Some firms have estimated the one-off cost of implementing either Scenario A or B for the base MA to be significant, but there was a wide range of estimates among firms that provided these.</p> <p>With regard to maintenance costs, this can be broken down into two parts:</p> <ol style="list-style-type: none"> 1. The ongoing cost of calculating the base MA, which on average, is not dissimilar to the current cost in terms of pound amount or required full time employees, “FTE”. 2. The ongoing cost of managing MA portfolio regulatory requirements, for which there is a wider range of response. Firms have estimated this to be anywhere from no change from the current cost to be up to six times as onerous under Scenario A and from no change to the current cost to up to two times as onerous under Scenario B in comparison to the current regime. <p>We note that this does not consider any subsequent impact on the internal model.</p> <p>For the RM, the estimated one-off cost of implementing either Scenario A or B is significantly less onerous compared to the MA. Again, the range varied across firms, but not as widely as in the case of the MA changes.</p> <p>Ongoing costs of running the RM calculations are more favourable compared to the current regime under the percentile approach by a factor of two on average, while the tapered cost of capital approach shows little difference to the current approach, as may be expected.</p>
<p>Reinsurance</p> <p>Questions 5 and 6 under “Reinsurance”</p>	<p>The QQ asks firms whether the proportion of the total gross best estimate cashflows on new business expected to be recovered from reinsurance (or alternative risk transfer arrangements) would change under Scenario A or B.</p> <p>As aforementioned, consensus among firms is that neither Scenarios A nor B reduce the RM enough to reduce longevity reinsurance. One firm noted that the FS changes would act to increase longevity capital on annuity business, so the combined change would likely still lead to an increase in longevity reinsurance on annuities to compensate.</p> <p>Two firms have also noted that a more punitive FS could lead to the consideration of asset-backed reinsurance, especially under Scenario A.</p>

Area of concern	Key themes from firms' responses to QQ
<p>Investment strategy</p> <p>Questions 3,4 and 5 under "Investment"</p>	<p>The QQ asks firms whether their asset allocation in their MA portfolio, other ring-fenced funds or other life funds would change under Scenarios A or B.</p> <p>Under both Scenarios A and B, a common theme among firms' MA portfolios is that investment in illiquid assets would reduce, given the penal nature of the CRP and VU elements of the FS. Conversely, investment in liquid corporate bonds would be encouraged as they can be rebalanced more easily than illiquid assets. This would be required, not just because of the change in relative FS between liquid and illiquid assets, but because the volatility introduced with the FS being a function of average spreads, would introduce a larger risk of procyclical behaviour.</p> <p>We note that one firm mentioned that since the impact of Scenario A on their MA portfolio showed a reduction in MA across all asset classes, they would not expect to need to materially change asset allocations.</p> <p>For non-MA funds, firms' responses were scarce though one common element was consideration of revised hedging of the interest rate sensitivity under Scenarios A and B.</p>
<p>Business growth</p> <p>Questions 4,6 and 8 under "Business Growth"</p>	<p>The QQ asks firms whether they would likely make changes to their business growth plans over the next three years under Scenarios A and B.</p> <p>The consensus from respondents with material annuity business was that if the QIS regime was adopted, the resultant increased capital requirement and balance sheet volatility would lead to an increase in new business strain, and as such, plans for future new business volume would reduce. This is significantly more onerous in Scenario A versus Scenario B albeit both scenarios were viewed as constraining new business volumes.</p> <p>Further, the loss in MA benefit was viewed to have a direct impact on the pricing of new annuity business. This would mean it would be more expensive for policyholders and pension schemes to access the market and may lead to some being priced out altogether. Alternative providers of pension risk solutions (super funds or international insurers) may become more attractive and the UK's position relative to other jurisdictions would also suffer.</p>

Suggestions to improve regulatory framework

The PRA requested practical and actionable suggestions to improve the regulatory framework, and the questions were left open-ended for participants to respond. A summary of the responses is provided in the table below.

Table 2.3: Summarised suggestions for how to improve the regulatory framework as provided in responses to the QQ

Area of concern	Key themes from firms' responses to QQ
<p>Streamlining MA approvals</p> <p>Questions 3d,3e and 3f under "MA approvals and eligibility"</p>	<p><i>Suggestions for streamlining approvals covered:</i></p> <ul style="list-style-type: none"> ■ <i>Greater knowledge sharing through a 'central library' of eligible assets and liabilities, removing the need for each firm to seek approval on a same features basis through "non-objection". Related to this, one firm commented that the application of 'same features' appears to be subjective, inconsistently applied across time and across firms and moves away from what the intention of Regulation 42, as transposed from the EU Directive was intended to cover.</i> ■ <i>A further suggestion is for the PRA to make clearer when an application is required and introducing a major/ minor approach in a similar way that is done for internal models, where consideration of materiality is taken into account.</i> ■ <i>A consideration of a move from a highly prescriptive approach towards a more principles-based approach to asset eligibility.</i> ■ <i>An improved engagement model with the PRA to facilitate knowledge transfer and understanding.</i> <p><i>It is estimated that cost savings in the range of 25% to 75% are possible based on the streamlining points suggests by firms. Some of this can be attributed to the length of time it can take for an asset to be MA portfolio approved. Therefore, costs are not just related to the resource required, but also the knock-on financial implications of the delay.</i></p>
<p>Assets considered to satisfy MA eligibility currently outside of MA portfolio</p> <p>Questions 4a and ab under "MA approvals and eligibility"</p>	<p><i>Themes raised by participants included:</i></p> <ul style="list-style-type: none"> ■ <i>The inclusion of a range of renewables as investments in the MA portfolio, however, these are often BBB- rated or below and therefore subject to cliff edge / uneconomic investments for the purpose of the MA portfolio.</i> ■ <i>Structuring assets is one way around ensuring MA eligibility; however, this is complex, and costly making the markets for long tenor debt less efficient.</i> ■ <i>Terms that are required to be agreed on UK infrastructure assets are often non-standard due to stringent eligibility requirements. This disadvantages UK insurance companies as investors. For example, the MA requirements create situations where pre-payment concepts that are otherwise standard in the UK infrastructure debt market are unworkable for MA investors.</i>

Area of concern	Key themes from firms' responses to QQ
	<ul style="list-style-type: none"> ■ <i>Inclusion of Private Finance Initiative / housing association / utility loans from banks in the MA portfolio.</i> ■ <i>Inclusion of unstructured Equity Release Mortgages ("ERM") in the MA portfolio given, fundamentally, the requirement to restructure does not materially alter the economics of the underlying asset.</i> ■ <i>Added flexibility around the assessment of make-whole provisions.</i> ■ <i>An alignment of the UK government's guarantee programme with the MA rules would unlock substantial additional long-term domestic capital for support of key export finance initiatives and take advantage of the strong insurer interest in government-guaranteed investments that has made programmes such as the Affordable Housing Finance scheme so successful.</i>
<p>Internal credit ratings</p> <p><i>Question 6a under "MA approvals and eligibility"</i></p>	<ul style="list-style-type: none"> ■ <i>While there were more scarce responses here, one firm suggested a more flexible approach that is not focused on ECAI ratings. Using internal ratings for some asset classes and ECAI ratings for others can result in inconsistencies.</i> ■ <i>Building on this, another firm suggested their preferred validation approach is for each asset class to make use of a combination of expert judgement, public proxy ratings, and ad-hoc external ECAI 'opinions', where the balance between these would depend on the expertise available and the risk profile of the asset in question.</i>
<p>Granularity of FS</p> <p><i>Question 9a and 9b under "MA FS Calculation"</i></p>	<p><i>Most participants agreed that the FS granularity could be increased to address some of the PRA's concerns, and their suggestions varied reflecting their individual firm FS issues.</i></p> <p><i>Suggestions to improve granularity included:</i></p> <ul style="list-style-type: none"> ■ <i>Allowance for firms to determine the FS for each asset class it defines, provided the FS chosen can be justified.</i> ■ <i>More granularity in the FS for non-financial corporate bonds as the category is too broad.</i> ■ <i>Greater differentiation within the BBB ratings.</i> ■ <i>Greater differentiation between liquid and less liquid assets.</i> ■ <i>Incorporation of collateralised assets, such as diversified portfolio of ERM</i> ■ <i>Higher potential recovery rate than 30% for real assets.</i>

Section 3: WTW view on the Solvency II review and QIS

Overview

When considering the aspects of the Solvency II review examined by the QIS it is important to recognise that the UK insurance market has changed substantially since the design and implementation of Solvency II, especially for annuity providers. For most of these writers of long-term business, there has been a significant shift in allocations from corporate bonds and gilts into higher yielding and illiquid assets – some of the benefits of which have been passed on to customers due to a competitive UK market – and significant transfer of longevity risk to overseas reinsurers not subject to the RM.

This has led to a regulatory regime with a greater level of complexity and PRA scrutiny, which suffers from long lead times for both MA applications to approve new asset, liability and reinsurance features, and major model change applications to update internal model capital methodologies. This stifles the ability of the UK insurance market to innovate and support longer term growth objectives.

There are positives to be drawn from both from the current regulatory approach and the preceding one; although it should be noted that no regime will be perfect and all will have some limitations. For instance, we recognise that:

- The existing Solvency II regime can arguably be viewed as working well with, for example, the UK insurance market being well capitalised and able to withstand the recent COVID-19 market turmoil;
- The prior UK Solvency I regime had some positive aspects and operated effectively through the late 2000s financial crisis with greater freedoms on investment allocations and a more principles-based approach to setting the liability discount rate;
- The MA was a key aspect of the Omnibus II package alongside the TMTP, which continues to support annuity firms' solvency ratios through the transition into the more onerous Solvency II regime, reflecting annuity writers' long-term investment horizons and fosters competitive customer pricing;
- The approach to the MA pursued in this QIS exhibits features that were under consideration and rejected prior to the implementation of Solvency II, features such as linking the FS to the credit spreads on the assets (QIS5)); and
- The MA approach that emerged in Solvency II were the result of intense UK led negotiation at the highest levels with the MA only being a focus for the UK and, to a lesser extent, Spain.

The UK's reforms provide an opportunity to retain what is good and successful about the existing approach and incorporate elements that make it better suited to the UK insurance and investment environment.

Meeting the objectives of the review

We believe that the review of Solvency II necessitates consultation with the industry to land on a suitable package of reforms which aligns with and supports the review objectives, as set out in HM Treasury's Call for Evidence.

On improving competitiveness (part of the first of HM Treasury's three objectives), the proposed introduction of a new secondary objective for the PRA on supporting the international competitiveness of the UK economy may support this aim, although as it is a secondary objective the weight given to it remains to be seen. Additionally, transfer of rule-making powers from legislation to the regulators in accordance with the proposals will, we hope, grant supervisors greater adaptability to react to developments in the UK market and cultivate innovation in the sector.

However, the reforms to the regime being considered presently are not conducive to an internationally competitive UK insurance sector. Protecting policyholders and ensuring the safety and soundness of firms is the second objective of HM Treasury. When balanced with a competitive market, a strong well-balanced regulatory regime can provide insurance customers with access to value-for-money products that provide peace of mind that their protection is secure even in the most challenging of economic circumstances. Indeed, a regulatory regime that fosters strong and sustainable growth in the economy will enhance safety and soundness of firms and policyholder protection.

The third of HM Treasury's objectives in the Solvency II review is supporting insurance firms to provide long-term capital to underpin growth and to invest in a way that is consistent with the Government's climate change objectives. The insurance sector's investments in long-term and illiquid assets have grown in recent years, particularly among life insurance firms that invest in longer term assets to back long-dated liabilities. The investments made by insurers in these assets help serve society by ensuring that capital is available where it is needed and reducing pro-cyclical effects in the wider economy. As stated in the Call for Evidence, infrastructure investment underpins long-term economic growth and productivity: it is essential for markets to function effectively, supports jobs, attracts investment, and boosts the standard of living of households and communities across the UK. Insurers are an important provider of this long-term finance need.

The approaches and calibrations explored in the QIS for the MA would likely reduce demand for long term credit risky assets, across all classes but particularly in the Government priority areas of infrastructure and illiquid assets.

Spreads as a forward-looking indicator of default and downgrade

The MA approach that has been adopted for the QIS appears to reflect an unsubstantiated PRA belief that credit spreads act as a strong indicator for the long-term level of future defaults and downgrades with spread movements feeding directly into the credit risk accounted for in the MA. This disrupts the very purpose of the MA which serves as the mechanism to protect insurers against artificial short term spread movements.

The MA has successfully separated “noise from the signal”, as noted in Charlotte Gerken's Life beyond Solvency II speech. However, the QIS approach to the MA would bring “noise” back into the balance sheet by incorporating current spreads or average spreads over a short period. Our view is that markets are on average efficient over the long-term and across asset classes. However, market prices can be inefficient over periods deviating from an efficient level.

Intuitively, it is perhaps not unreasonable for the PRA to consider allowing for some relationship between total spreads and the credit risk-related component in certain circumstances, i.e. as a forward looking indicator of increased expectation of default and downgrade. For example, at the level of individual bonds, a significant and sustained widening of spreads can be a prelude to downgrade. As evidence of this, the spread curve inverted during the credit crunch, suggesting increasing near term risk of default.

However, in the context of the MA care is needed as there is inconclusive evidence to support the strong implied long-term relationship inherent in the QIS scenarios^a, which introduces considerable and undesirable spread volatility into the MA. Markets often overreact on bullish and bearish sentiment. Cyclical factors mean that credit spreads tend to be in a calm regime for a number of years and in an elevated state for a period after.

The position is a bit clearer when setting stressed default allowance assumptions for capital modelling – a strong relationship between spread movements and default allowances would be considered appropriate as reflected by insurer internal model correlation assumptions.

It is important here not to confuse best estimate and stressed views of risk and risk correlations with levels of uncertainty allowed for within the SCR. To be appropriately made use of as a long-term forward-looking indicator of default and downgrade costs, spread movements would need to be significant and sustained.

As indicated through qualitative responses, the QIS approach makes insurers concerned about short-term market volatility. This volatility has the potential to encourage pro-cyclical investment behaviour and lead to insurers becoming forced sellers of assets during times of stress and having reduced appetite for investing in long-dated illiquid assets with it becoming almost impossible to predict the economics over the lifetime of an asset. The desire of Solvency II is to avoid artificial volatility in balance sheets, i.e. volatility of technical provisions, capital resources or capital requirements that do not reflect changes in the financial position or risk exposure of the insurers. The existing approach to FS is a countercyclical, through-the-cycle approach.

^a The PRA's "Hidden Depths" presentation (see endnote 5) referred to published academic work on this issue. An analysis of this published academic work is not in the scope of this report.

For instance, during times of crisis, such as the COVID-19 crisis, the MA provided an offsetting reduction in liability values to counter the increase in spreads on asset valuations resulting in a relatively stable balance sheet without the pressure of short-term capital management issues or forced sales of assets. This was rightfully acknowledged by senior figures in the PRA during April 2020 as the MA behaving well and as intended, with the signal being downgrades and short term spread movements representing noise.

It is true that the existing MA approach is highly dependent on credit rating assessments which are imperfect and tend to lag market movements – but the lag is short and ratings are reliable for use in the context of a long-term book. The message from Sam Woods, in his 23 April 2020 letter to insurance firms, made clear a request for firms not to overreact by making knee-jerk changes to internal rating assessments and to “take full account of the unprecedented level of support provided by governments and central banks domestically and internationally to protect the economy”.

Well balanced and considered use of expert judgment is required in decision making over rating assessments of both internally and externally rated holdings to accurately reflect forecasts over the long term. For this reason, ratings may sometimes be justifiably slow to update (and not react to market “noise”), with good rationale required to make an update for increased credit default risk and avoid ill-founded and overly volatile rating changes.

The approach adopted under the QIS is mechanistic, with less ability for firms to make these balanced and considered expert judgments in their investment and risk management approaches and leading to the exact type of over-reaction advised against over the initial stages of the COVID-19 pandemic period and greater procyclical behaviour. The spike in credit spreads was short lived noise which quickly reverted. There does not appear to have been any change in expectations for downgrade and default costs over the lifetime of MA portfolios. As such, the current MA did its intended job.

Notwithstanding the above, we suggest alternatives to the existing MA in the section on the possible way forward below.

Implications for internal models

There are important questions that still need answering when considering the potential financial and operational SCR implications of the PRA’s spread-based calibration approach in the QIS. This is an extremely technically challenging area to allow for within existing credit models that have only been (re)developed recently. Several UK insurers are currently going through Major Model Change (“MMC”) processes to allow for the PRA’s MA under stress five-step framework, and to accommodate bespoke approaches for new asset classes as well as to bring in allowance for the EVT in stress validation framework which applied from 31 December 2021 on securitised ERM assets. The significant reforms to the MA methodology proposed by the QIS adds further complexity to models that are still evolving.

The HM Treasury competitiveness objective indicates that regulators should not require firms to hold unnecessary capital. UK firms using Internal Models hold significant allowance for large increases in default and downgrades in stress scenarios benchmarked to the worst event in history for which data is readily available (the 1932/33 Great Depression) and typically well beyond Standard Formula credit capital requirements. If PRA proposals for additional margins for uncertainty in the BEL are adopted SCR approaches need to be reconsidered to avoid double counting of risk. Alternatively, a higher allowance for credit losses in the base MA and reduced MA absorbency may suggest the level of MA

absorbency in stress is also reduced per the QIS sensitivity analysis leading to higher credit risk capital requirements.

Here it is necessary to decipher how much worse things could get during a crisis i.e. if you are in the middle of a 1-in-100 loss event should the capital calibration reflect that to avoid layering on a further 1-in-200 stress on stress with spreads being seen to quickly revert following a period of crisis? Additionally, can allowance be made for the type of government interventions and fast-moving vaccine developments that have to date shown the COVID-19 pandemic to be relatively benign as a credit default event, despite the initial global market uncertainty, impacts on GDP, and market spread blow outs?

Any knock-on detrimental impact on SCR will further impact the health and competitiveness of the UK insurance market in excess of the £3 billion Own Funds impact shown for Scenario A in our sample of firms. Care is needed to ensure there isn't an unjustified reduction in Own Funds. Putting additional margins in the BEL should justify lower SCR requirements, all else being equal.

QIS as an input to the Solvency II reforms

The QIS process has asked much of insurers and the response rate and response quality appears to be high. Despite this, there are two types of limitations in what a QIS of this nature can deliver.

The first type of limitation is what the QIS does not cover. The QIS specifies that firms with internal model approval should use their current models to compute the SCR and that no adjustment should be made to those models to reflect the FS design being tested under Scenarios A and B.

The QIS also provides only two methodological approaches for both the RM and the MA, which, especially for the MA, only considers the PRA's perceived limitations in the existing framework from one perspective. However, it is the total requirements (technical provisions plus solvency capital requirements) which are paramount and need to be assessed together. Additionally, and with this in mind, it is not clear how suitable policy options can reasonably be determined from QIS outcomes which, as illustrated in Appendix C and Appendix D, represent extreme data points for the unexpected MA changes, and have material consequences on the industry balance sheets, their competitiveness and product pricing as currently formed.

Other missing components – which are arguably not well-suited to assessment via data collected from firms – are details on the scope for expanding the range of MA-eligible assets and liabilities and streamlining the approval process. Firms require a clearer articulation of MA-eligibility, since aspects of the existing process are subject to discretion including the requirements for complex, artificial, and costly MA securitisation structures that demand significant industry and regulatory bandwidth.

The second type of limitation is in the accuracy with which firms can assess the implications raised in the QQ. The main examples of this are in the implications for business growth, reinsurance and alternative risk transfer and investment strategy, where firms have generally had difficulty in estimating the outcomes of what would be a very complicated chain of events should the QIS scenarios become practice.

One further limitation is how firms will be expected to explain the approaches to stakeholders. The limited rationale behind certain methodological decisions has the potential to make the approaches difficult to explain and justify. An example of this is the VU component which as a margin for uncertainty should generally be accounted for as a capital item and so the VU would result in double-counting in the regime. One could also challenge why an exit or transfer value approach is appropriate for the RM (as opposed to a run-off approach), particularly given how difficult it is to calibrate.

We hope for these to be clarified in further dialogue on the development of the reforms should this be the direction of travel.

Implications for annuity providers and pension risk solutions

UK pension schemes can de-risk by entering into Bulk Purchase Annuity (“BPA”) arrangements with insurers. Insurers offer competitive rates for BPA deals by utilising long duration and illiquid assets, including restructured ERMs, infrastructure debt, and commercial/residential real estate loans, which are suitable long-term matching assets used to obtain predictable returns in the current low interest rate environment. The MA is critical to the pricing of these BPA transactions.

Contrary to the insurance sector’s closely cashflow matched investment approach, pension schemes often invest in a mixture of a liability driven fixed interest investments (“LDI”) and other assets (property, equity, insurance-linked securities) with a simpler matching approach (e.g. duration matching). The insurance sector, with its professional management and robust capital-based regulatory regime, could be considered well suited as the final destination for management of pension scheme defined benefits.

The design and level of the FS is a key investment consideration as it impacts the risk-reward profile of assets, the return on capital and how firms will optimise their balance sheets. Firms in our analysis have indicated that they would expect reduced new business volume under the QIS scenarios, attributing this to greater capital strain (lower MA) and balance sheet volatility (link to credit spreads) and a greater allocation to risk free assets that would result in a diminished ability to invest in higher yielding assets to back long-term liabilities. Other things being equal this is likely to lead to higher and more variable prices for customers.

The wider impacts of this should also be noted, specifically:

- Any proposals that lead to more volatile annuity pricing risks making BPA deals more challenging. As BPA transactions can take some months from start to finish to transact, increased volatility could lead to failed transactions where, what was originally affordable becomes unaffordable due to increased difficulty for a pension scheme to invest its assets such that their value closely tracks daily changes in annuity pricing. Although insurers currently offer solutions to deal with this issue (“price locks” or “asset locks”), that might become more difficult if pricing is too volatile. Failed transactions are not helpful to the insurance industry’s reputation and may also generate some challenges in relation to the FCA’s conduct principles.
- The Pension Protection Fund (“PPF”) charges levies to UK corporate defined benefit schemes to help fund the cost of providing PPF compensation to members of such schemes whose sponsor employer becomes insolvent.^a The levies are impacted by the funding shortfall within a pension scheme, namely the difference between its assets and the estimated cost of insuring PPF compensation with annuities. Therefore, should insurer pricing increase, all other things being

^a The levies over the PPF’s 2020/2021 financial year were £630 million.

equal, annual PPF levies on UK corporate defined benefit schemes and ultimately in many cases their sponsor employer would increase.

- A very large proportion of UK corporate defined benefit schemes are aiming to eventually insure all their liabilities with annuities. In many of those cases the journey to eventually affording annuities includes annual funding commitments from the corporate sponsor. Should insurer pricing increase then many corporate sponsors will need to increase the funding to their defined benefit schemes to the detriment of investing in business growth and UK employment.
- Should annuities become less affordable, then alternative non-insurance sector solutions, which offer less security to defined benefit scheme members, will become more common place. A timely example are superfunds which, although nascent, could become more significant should annuities be seen as expensive. Superfunds are primarily intended to accept transfers of defined benefit pension schemes that cannot currently afford annuities, are unlikely to afford annuities in the shorter term, and whose corporate sponsor is weak. The superfund regime, overseen by the Pensions Regulator (“TPR”), is a capital-based regime but bears little resemblance in terms of the strength of the Solvency II regime and protection offered to insurer policyholders. In a scenario where UK annuities become less attractive, insurers and insurance sector investors may be encouraged to consider looking to set up alternative solutions, such as superfunds, that would bypass the insurance regulatory regime.

The PRA’s primary objective is to be responsible for the protection of (current and future) insurance policyholders, so any reforms to Solvency II should also consider the wider impact on the UK retirement market and UK corporates that fall outside the PRA’s regulatory scope. A competitive UK insurance buy-out offering is a necessity when considering the protection of UK pension scheme members. Noting that insurers are viewed as the “gold standard” for policyholder protection, pension scheme members are, by definition, viewed as significantly better protected under the existing Solvency II insurance regime than under the TPR regime.

Reducing the competitiveness of the buy-out market in the UK and removing an important source of long-term investment could both significantly hinder the UK economy and growth prospects and reduce the overall levels of protection for pensioners.

Next steps

Firms are actively looking for a better engagement model with the PRA to facilitate knowledge sharing and understanding and to develop reforms that allow the objectives of the UK’s Solvency II review to be met. The PRA Roundtables, which have brought industry stakeholders and the regulator together to discuss potential reforms, offer a promising model for future engagement.

The PRA did, however, suggest at the most recent Industry Roundtable that it favours bilateral discussions around the impacts on SCR given the bespoke nature of firms’ internal models. There is the risk that this approach does not move the exercise forward with the starting predication for such discussions being that only a spread-based approach to the calibration of the QIS CRP is up for consideration with alternative mechanisms of reform, including less drastic modifications of the existing MA calculation framework and discussion on whether any change is needed at all not being considered.

We would consider it more appropriate to study a wider range of potential reforms that may better accommodate the changes viewed as necessary by all stakeholders. Before any revision is considered there should first be some objective analysis that demonstrates whether the current design

presents any material deficiency from a risk perspective at a total MAP level (i.e., including allowance for credit risk within the SCR) that would warrant reform.

On the two main areas considered by the QIS, we set our initial views on potential routes forward below and welcome further collaborative dialogue on these matters.

A possible way forward for the MA

It may be possible to incorporate some greater risk sensitivity into the existing MA framework. In doing so, this should also take account of some of the limitations in the expected default loss calculation that have not been revisited in the QIS.

- We have previously noted that markets can overreact at a macro level. Linking the FS directly to movements in current spreads, as done in the QIS scenarios, does not provide meaningful explanatory information on the risk of upgrades or downgrades and creates significantly increased volatility, which is undesirable as spreads can have a habit of widening and narrowing over a short timeframe. For any proposed amendment in the MA therefore, a sensible approach using robust evidence is required which considers the need for any demonstrable and sustained change in the view of long-term downgrade and default risk.
- Rating agencies and insurer credit teams consider detailed credit analysis which allows the underlying risk to be assessed. However, rating outlooks and downgrades other than a full letter are not currently allowed for in the FS, creating a delay in recognising the increased risk retained through holding the asset which results in a cliff edge jump as the full letter downgrade occurs. This is a consequence of the lack of granularity under the existing approach, rather than a deficiency in the method of credit assessment.
- Additionally, an approach closer to the existing regime that explores increased granularity of FS calibration might better provide for the balance required.
- Increasing the granularity of CQS mapping or introducing an allowance for a judgment-based override (e.g. FS interpolation between CQS), for example, may provide a more flexible mechanism to allow an improved glide path into a full rating CQS downgrade. This would require a robust governance and validation framework.
- Such an approach would help to i) mitigate possible regulatory concern over the risk that insurers chase yield by investing in assets in the lower reaches of a CQS category to gain additional MA, and ii) increase the risk sensitivity if there are notch downgrades.
- A framework could be developed to allow firms more ability to make use of their own analysis of individual bond spread movements (e.g. relative to assets of the same CQS and tenor buckets) combined with consideration of bespoke illiquid asset risks and internal and external rating assessments as useful indicators to support the CQS mapping process. Firms already use such approaches for counterparty risk, e.g. changes in reinsurer debt spreads and CDS prices.
- Clear stress and scenario testing of individual bond issuers and sectors could allow for forward-looking indicators. Whilst firms may already do this as part of their investment and risk management, there is limited ability to reflect a view of a change of risk in the FS and hence MA.

A possible way forward for the RM

We consider that it is the calibration of the chosen approach to the RM that is the key issue. The percentile approach, as calibrated in the QIS, has been shown to have reduced interest rate sensitivity relative to a cost of capital approach, a core concern with the existing RM. However, its calibration penalises shorter-term business, increasing the RM significantly relative to the existing regime. This could be pragmatically addressed by allowing for a term-dependent percentile calibration or by making allowance for a differing percentile calibration by homogenous product groups.

Alternatively, the tapered cost of capital approach could also give RM reductions across all durations and reduced interest rate sensitivity if the lambda factor was suitably decreased. The tapered cost of capital approach in the QIS is presently more conservative than the calibration the EC is proposing.

Section 4: Distribution, reliances and limitations

Distribution

This report was prepared for the Association of British Insurers' ("ABI") sole and exclusive use and on the basis agreed. It was not prepared for use by any other party and may not address their needs, concerns or objectives. This document and any related information provided by WTW may not be referenced or distributed in any form to any third party other than as agreed by us in advance in writing. We do not assume any responsibility, or accept any duty of care or liability to any third party who may obtain a copy of this document and any reliance placed by such party on it is entirely at their own risk.

Draft versions of this document should not be relied upon by any person for any purpose.

Reliances

In developing this document, we have relied on confidential and publicly available data, including quantitative and qualitative information. We have not independently audited or verified this information; however, we have reviewed it for general reasonableness and consistency with our knowledge of the insurance industry. Reliance is therefore placed on the accuracy of such information as obtained by us.

The accuracy of our findings is dependent upon the accuracy and completeness of the underlying data.

Reliance is placed on, but not limited to, the following information which we did not independently verify:

- Confidential ABI response to the PRA QIS, received 3 November 2021.
- Confidential submissions of quantitative and qualitative questionnaire data from 16 firms that participated in the PRA QIS, received 22 to 26 November 2021.
- Discussions with 16 life insurers from 23 July to 5 October 2021, including a Chief Actuaries forum discussion with 19 participants on 6 October 2021.
- PRA QIS materials, including the main QIS template, the QIS instructions, the qualitative questionnaire and the "Q&A", downloaded from the PRA QIS website on 19 November 2021.
- The PRA Roundtables with industry, held on 7 October 2021 and 30 November 2021.
- KPMG's report on the economic impacts of potential changes to the insurance regulatory framework in response to HM Treasury Review of Solvency II: Call for Evidence, February 2021.
- Markit iBoxx data used to determine illustrative FS and MA for Financial and Non-Financial corporate bonds.

We also relied upon certain references within public speeches and documents as listed in the References section below.

Limitations

This document was prepared for use by persons technically competent in the areas addressed and with the necessary background information. This document was produced based on information available to us at, or prior to, 14 February 2022, and takes no account of developments after that date. WTW is under no obligation to update or correct inaccuracies which may become apparent in this report.

The report provides an explanation of the key challenges of the approaches explored in the QIS and summarises the outcomes for a subset of major UK insurers. Due to the nature of the PRA's impact study, this report focuses on specific, technical aspects of the regime, most notably those with significant relevance to annuity providers. While the report does refer to other, more general aspects of the solvency regime, this is only in the context of changes resulting from the specific areas covered in the impact study. Our analysis is not limited to the implications for providers of annuities; however, the focus is on aspects of the regime which most clearly affect those firms which write long-term guarantees, such as annuities. We do not comment on the implications for providers of general ("non-life") insurance.

The QIS may or may not be a reasonable representation of end regulation adopted by the PRA. Readers should not rely on results presented here for making decisions about the running of a MA portfolio or annuity fund.

Simplifying assumptions have been made for the purposes of providing illustrative results where we have used a representative portfolio for the analyses of MA and RM. In particular, we have not analysed changes in TMTPs resulting from the movements in MA and RM, and we have ignored the impact of any reinsurance. We also note that our MA analysis does not consider a scenario where spreads are lower than current spreads.

Our report contains analyses of selected responses to the QIS from participating UK life and composite insurers. The results are presented in aggregate form only and do not represent the UK insurance market in total. Any errors or misinterpretation of the QIS instructions by firms could have distorted our analysis and we have not checked firms' submissions other than for high level reasonableness using our industry knowledge. Furthermore, the analysis does not cover the impacts on non-life insurance business. The results of our analysis should not be construed to represent the results of any one firm.

Appendix A: Regulatory background

Development of the framework

The insurance prudential regulatory regime that is in force in the UK is the result of decades of development in the way in which insurers and reinsurers are regulated and supervised. While compliance with European Union (“EU”) Directives has been a defining feature, the UK has had significant influence on regulatory direction, in particular (within Solvency II) for key elements such as the RM and MA.

Commonly referred to in retrospect as “Solvency I”, the first set of minimum solvency requirements for life insurers in the then European Economic Community^a (“EEC”) were established in 1979 and subsequently updated in 1990 and 1992. Solvency I provided local country regulators much flexibility, but when first introduced did not explicitly cater for the variety of insurance company risks profiles; minimum capital requirements were set according to reserves held or a very broad measure of risk exposure. The regime was not aligned with the economics of (re)insurers’ businesses and was limited in its sensitivity to the risks to which they were exposed.

As early as 2001 the concept of a new solvency regime for European insurers was already being discussed. “Solvency II”, as the regime came to be known, would apply to all European Union (“EU”) authorised (re)insurance undertakings and (following various delays) became live in 1 January 2016.

On 31 December 2004, the UK brought into force an accompaniment to Solvency I: the Individual Capital Adequacy Standards (“ICAS”) framework. A significant component of the ICAS was the Individual Capital Assessment (“ICA”) which sought insurers’ own assessments of their capital requirements, given their risk exposures. By design, the ICAS framework represented a form of principles-based regulation and greatly influenced the design of Solvency II. The UK was a strong voice influencing the development of Solvency II and the regime benefits from the own assessments of capital that were pioneered in the ICAS.

Like the UK ICAS framework, Solvency II is a risk-sensitive regime in that the capital a firm must hold is dependent on the nature and level of risk a firm is exposed to. The EU law that codifies EU insurance regulation is the Solvency II Directive¹⁷ which is implemented in UK law by *Solvency 2 Regulations 2015*, the Solvency II Delegated Regulation and the PRA Rulebook. It has been characterised as a “maximum harmonised” directive¹⁸, reflecting that national supervisory authorities are limited in their ability to impose treatments that vary across jurisdictions.

Development of the MA

The MA concept has its roots in the illiquidity premium that was eventually adopted for reserving under Solvency I. The illiquidity premium was determined as a percentage of the difference between the rate of return on the assets held and the rate that can be earned (in theory) “risk-free” and had a wide application. This allowed insurers to apply a higher discount rate for liabilities where the insurer could argue that an illiquidity premium was earned on the backing assets.

^a Comprising Belgium, Denmark, Germany, Ireland, France, Italy, Luxembourg, Netherlands and the UK.

The initial design of Solvency II released in 2009 didn't incorporate an illiquidity premium. This prompted much debate resulting in the establishment of the Liquidity Premium Taskforce by the Committee of European Insurance and Occupational Pensions Supervisors ("CEIOPS", the predecessor to the European Insurance and Occupational Pensions Authority, "EIOPA"). The taskforce produced the March 2010 Liquidity Premium report setting out principles for setting the illiquidity premium.

The Liquidity Premium report included a proxy for the illiquidity premium as a formula which implied that a fixed portion ("y") of the total spread would be an allowance for long-term expected losses and a proportion ("x") of the remainder as the liquidity premium. The difference "(1-x)" of the remainder represents thus the risk premium for unexpected credit risk (or uncertainty). This formulation was the basis of the approach that followed in the industry quantitative impact study that began in July 2010.

The fifth and final quantitative impact study before Solvency II was agreed, also known as "QIS5", was when the concept of the "matching adjustment" was introduced (around this time it was also referred to as "matching premium"). QIS5 calculated a theoretical illiquidity premium using the formula: $50\% \times (\text{credit spread} - 40 \text{ basis points})$ and applied this fully or partially to the discount rate used for different classes of business. This was a method suggested by the European Insurance CFO Forum and CRO Forum in April 2010.¹⁹ To determine the extent that this applied to certain lines of business, a bucketing approach was proposed where products were classified into 50%, 75% and 100% groups. The 100% application was granted to business where the risks are only longevity and expense risk, there is no surrender of any form and the premiums have already been paid. For business where 100% did not apply, a 75% illiquidity premium applied to life contracts with profit participation and 50% to everything else.

The 100% application rate was most commonly used for different types of annuity (including non-life annuities), but also to retirement business in run-off, unit-linked insurance, health and non-life insurance. Supervisor feedback was that the bucketing approach raised concerns ranging from the inconsistent application of the illiquidity premium buckets to a lack of guidance on how to treat certain business (for example, whether group annuity policies should be in the 50% or 100% bucket).²⁰

Two years after QIS5 and with the deadline for the introduction of Solvency II on the horizon, the Long-Term Guarantees Assessment ("LTGA") was conducted, proposing an alternative formulation of the MA. This approach referenced a Cost of Default and a Long-Term Average Spread which extended over 30 years. The calculation used 75% of this LTAS as a lower bound on the deduction to credit spreads used to calculate the MA.

Solvency II was introduced in 2016 using a modified version of the MA that was used in the LTGA, the percentage of the LTAS was reduced to 35%.

The inclusion of the MA was a relatively late addition to Solvency II that enabled the Solvency II Directive to be agreed and involved European political negotiation and compromise at the highest levels. The focus of UK industry lobbying was on life annuity products given their materiality to the UK industry. At the time of writing, only firms in the UK and Spain have applied for and been granted approval from their respective regulators to use the MA.

Calculating and calibrating the RM

The RM is defined under Solvency II as the amount added to best estimate liabilities so that technical provisions correspond to the current amount insurance and reinsurance undertakings would have to pay if they were to transfer their insurance and reinsurance obligations immediately to another insurance or reinsurance undertaking.

While the RM has no direct historical equivalent in Solvency I, the Solvency I practice of applying prudence in the reserving calculation, either through deductions to the discount rate or margins for uncertainty in the assumptions, also meant that insurers held provisions greater than what would be considered “best estimate”.

“QIS2”, which ran from May 2006 to July 2006, tested a RM set to the 75th percentile of provisions for both life and non-life business. Subsequently, the European Commission (“EC”) requested that CEIOPS evaluate two possible methods for calculating the RM be evaluated:

1. A percentile approach, where the RM is given by the difference between the 75th percentile of the underlying probability distribution until run-off and the best estimate, subject to a minimum of half a standard deviation to take into account strongly skewed distributions.
2. A cost-of-capital approach, where the RM is calculated based on the cost of providing required capital to support the business. The theoretical basis for this was the transfer value measurement principle.

The CEIOPS analysis produced in March 2007, based on QIS2 results, found that the RM for the percentile approach (using the 75th percentile) and the cost-of-capital approach (using a 6% cost of capital) were roughly similar (the UK country report states that the ratio of the two approaches was in the range of 99% to 101% for life firms, although there were likely to be greater variation at a product level and by duration) and concluded that, for non-hedgeable risks, the cost of capital approach should be used. Subsequently, a cost of capital rate of 6% per annum was adopted based on the Swiss Solvency Test calibration.²¹

The CRO Forum published a July 2008 paper that evaluated a range of methods to determine the cost of capital for the purposes of the RM. The paper concluded that a suitable range for the cost of capital rate to be applied to an SCR calibrated to a 99.5% confidence interval over a 1-year time horizon is 2.5% - 4.5%.

A CEIOPS consultation on the RM in 2009 highlighted that a number of questions were raised regarding the appropriateness of the 6% cost of capital rate and the work of the CRO Forum was referenced by several undertakings. They argued that it is questionable whether such a choice would lead to a reliable proxy for the cost of transferring a portfolio to a willing third party. Others felt that the cost-of-capital factor of 6% may overstate the true cost of capital for companies that may hold or acquire these liabilities.

The CEIOPS consultation found that further consideration should be given to the appropriateness of the 6% cost of capital factor. However, QIS5 adopted a 6% cost of capital rate and this was the calibration that was eventually used for Solvency II.

Solvency II also introduced the Transitional Measure on Technical Provisions (“TMTP”) to help smooth in the capital impact of Solvency II over a 16-year period. Where adopted, this mechanism largely offsets the impact of the RM on business sold prior to 2016. A recalculation of the TMTP can occur every two years after 1 January 2016 or more frequently to reflect a material risk profile change. In 2016, firms recalculated TMTP at mid-year and year-end as a result of interest rate volatility.

Appendix B: The Prudential Regulation Authority's QIS

Introduction

QIS is a data gathering exercise to assist in the PRA's analysis of potential Solvency II reform options. An estimated year-end 2020 basic risk-free rate ("RFR") curve based on SONIA rates was produced by the PRA for the QIS exercise.

The PRA set out in its 30 November 2021 industry roundtable¹⁹ that:

- For the RM, no preference for a specific design was expressed in the Call for Evidence responses and it took an open-minded approach to the RM for the QIS, testing two well-known designs.
- For the MA, the designs more explicitly recognise the risk profile of individual assets and make more allowance for the CRP. Its key aim was to look at a spread-based measure for the FS (taking information from spreads as well as credit ratings) and it has no view on which of the scenarios are preferable or how they should be calibrated.

Runs requested

The QIS requested up to 18 runs from firms. Run ID 1 was requested of firms with TMTP and assumed a recalculation of the TMTP.

The Run IDs for the different type of runs requested for the QIS are shown in Table A.1

Table B.1: QIS Run IDs used for quantitative analysis

Description	Baseline	Scenario A ^a	Scenario B
Year-end 2020 RFR	Run ID 0 & 1	N/A	N/A
Year-end 2020 SONIA RFR	Run ID 2	Run ID 7	Run ID 13
Year-end 2020 SONIA RFR +200bps	Run ID 3	Run ID 8	Run ID 14
Year-end 2020 SONIA RFR -100bps	N/A	Run ID 9	Run ID 15
"Moderate" Spread Widening	Run ID 4	Run ID 10	Run ID 16
"Extreme" Spread Widening	Run ID 5	Run ID 11	Run ID 17
"Extreme" Spread Widening with Downgrades	Run ID 6	Run ID 12	Run ID 18

Note that Scenarios A and B and the associated economic sensitivities, SONIA is used as the basis for the basic risk-free rate. Therefore, the impact the scenarios and sensitivities are measured against the SONIA baseline scenario.

^a Under Scenario A, a version of the MA is calculated with and without a cap on the level of CRP in the FS.

Credit sensitivities

For credit spread sensitivities, firms with approval to use MA and/or VA were asked to value each asset, both within and outside the MA portfolio, based on the specified credit spread change in Table A.2 assuming that the spread change is applied additively to the asset annual Z-spread as at year-end 2020. Downgrades are applied to liquid and illiquid assets using the percentages in Table A.2. For example, every CQS1 asset should be split into two identical assets, but with the one asset being rated CQS1 and having 75% of the total market value and each projected cash-flow, and the second asset being rated CQS2 and having 25% of the total market value and each projected cash-flow.

Table B.2: QIS credit spread and downgrade sensitivities

CQS	Credit Spread Sensitivity 1: Moderate widening (basis points)		Credit Spread Sensitivity 2: Extreme widening (basis points)	Credit Downgrade: % of assets assumed to downgrade by one CQS	
	Financial	Non-Financial		All	All
CQS0	50	50	150	15%	
CQS1	75	50	200	25%	
CQS2	100	50	350	10%	
CQS3	125	50	700	10%	
CQS4	250	125	1400	0%	
CQS5	350	175	2100	0%	
CQS6	600	300	3500	0%	

QIS parameters

The tables below show the parameters for the five-year average spreads, the Credit Risk Premium (“CRP”) floor, cap (applicable in Scenario A only) and Valuation Uncertainty (“VU”) adjustment as published in the QIS for the approach to calculate the FS.

Table B.3: Five-year average spreads for CRP

CQS	Financial (basis points)	Non-Financial (basis points)
CQS0	90	79
CQS1	121	112
CQS2	180	159
CQS3	276	197
CQS4	462	379
CQS5	693	656
CQS6	693	656

Table B.4: CRP floor

CQS	Financial (basis points)	Non-Financial (basis points)
CQS0	11	4
CQS1	27	19
CQS2	43	28
CQS3	72	40
CQS4	168	117
CQS5	391	184
CQS6	391	184

Table B.5: CRP cap

CQS	Financial (basis points)	Non-Financial (basis points)
CQS0	56	42
CQS1	101	86
CQS2	153	124
CQS3	229	166
CQS4	507	403
CQS5	1,037	623
CQS6	1,207	793

Table B.6: VU adjustment

CQS	IFRS Level	Financial (basis points)	Non-Financial (basis points)
All	Level 1	0	0
All	Level 2	7.5	3.75
CQS0-3	Level 3	7.5	3.75
CQS4-6	Level 3	25	12.5

Basis of QIS assessments

When carrying out the QIS assessments in Appendix C, we have assumed the following:

- The CRP floor is applied in both Scenario A and Scenario B;
- The CRP cap is not applied in Scenario A; and
- In line with how firms categorise the majority of investments, all corporate bonds are assumed to be IFRS Level 2, and all illiquid credits are assumed to be IFRS Level 3 for the purposes of the VU component.

Appendix C: Analysis of the Matching Adjustment

Summary of key points

This appendix introduces the Solvency II MA, summarises the approach explored in the PRA QIS and analyses the results under selected sensitivities and over the period of the pandemic.

The MA formulation in the QIS represents a significant change from the current approach and means that movements in asset spreads feed through directly into the MA.

We note the following key points:

- The ability of insurers to invest in long-term, illiquid assets may be impacted if these assets are made less attractive under the new regime through a reduced MA benefit. This could have follow-on impacts on economic growth and development if a key source of patient capital is removed from the market.
- Additionally, the more volatile QIS approach with its strong dependency on short-term spread movements would be challenging for firms to manage and oversee without any ability to make their own judgments or overlays.
- Short term market spread movements cannot be relied upon as a good indicator of future default and downgrade risk. Markets often over/under react and will have short term fluctuations at both macro and micro levels. Temporary market spread movements should not be allowed into the FS as it exposes insurers to short term fluctuations.
- However, movements in spreads of an individual asset – provided these movements represent a sustained change in the view of long-term downgrade and default risk – may offer some indication that a potential downgrade could be on the horizon..
- Downgrades currently produce a cliff edge movement in credit loss expectations. A different MA formulation may be possible to address some of the drawbacks of this MA cliff edge without the problems created by the approach adopted in the QIS. Increased granularity of calculation could smooth the impact of downgrade with, for example spreads being used as a useful indicator to supplement rating analysis and / or additional sub levels of FS to map to.

Introduction

The UK's current insurance regulatory regime, which is at present materially aligned with the EU's Solvency II rules, makes available an MA on certain products, namely annuities, that have highly predictable cashflows (cannot be lapsed / surrendered and meet certain criteria with respect to the underwriting risks^a) and where the backing assets very closely match the liabilities and are fixed and bond-like in nature. When permission to use MA is obtained, the discount rate for liabilities is the basic

^a As specified in Article 77b of the Solvency II Directive, one of the conditions that applies is that the only underwriting risks connected to the portfolio are longevity risk, expense risk, revision risk and mortality risk. We note that there are products with highly certain cashflows but which are subject to other underwriting risks.

risk-free rate plus the MA, which is applied as level basis point uplift across the term structure of the basic risk-free yield curve.

The MA is used extensively by UK annuity providers and performs an increasingly important role given the growth in Bulk Purchase Annuity (“BPA”) market activity in recent years. The amount of funds held in UK MA portfolios is estimated at around £335 billion and the MA benefit is valued at £81 billion as at year-end 2020.^{22,a} Across Europe the MA is not as widely used given the differing nature of liabilities, with Spain being presently the only EU Member State having approved MA applications.

Article 77b in the Solvency II Directive²³ states that insurance and reinsurance undertakings may apply a MA to the relevant risk-free interest rate term structure to calculate the best estimate of a portfolio of life insurance or reinsurance obligations, including annuities stemming from non-life insurance or reinsurance contracts subject to prior approval by the supervisory authorities where a specified set of conditions are met.

The MA facilitates “buy and maintain” investment strategies where assets are invested with the intention of holding them to maturity and traded only for sound risk and portfolio management reasons – for example to mitigate against future downgrades and defaults.

The premise of the MA is based upon the view that by following a close matching strategy throughout the lifetime of the portfolio the risk retained by the insurer is the actual default and downgrade experience relative to that expected. Provided this remains in line with expectations over the long term, policyholders will be rewarded through insurers offering more competitive products. Without the MA, spread volatility would affect asset values (but not liability values) and so introduce artificial balance sheet volatility which could trigger procyclical investment behaviour, i.e., insurers would likely be forced to sell assets when spreads temporarily elevate unless they held material capital buffers.

Within the existing Solvency II regime insurers must be suitably capitalised to allow for default experience being in excess of the long-term expectation to withstand a “1-in-200” loss event^b. In the UK, amongst larger insurers, this risk is typically allowed for in complex internal models with credit risk modelling being a major area of focus as one of the key material risks. UK insurers with internal models typically hold significantly more credit risk capital than required by the Standard Formula for a standard UK corporate bond portfolio (c25-45%^c more) with models benchmarked against the 1932 Great Depression, the worst year in historic data sets for credit losses.

The extent of dampening of spread volatility provided by the MA is being revisited by the PRA’s re-examination of the underlying MA calculation approach. This is described in the Bank-Overground paper “Why the PRA is revisiting the Solvency II matching adjustment.”³

^a The benefit would be materially less if it is calculated against gilt rates instead of the Solvency II basic risk-free rates (which is based on swaps).

^b In simple terms, that each company holds enough capital to withstand the events of the next 1 year with a probability of 199 out of 200.

^c WTW UK Risk Calibration Survey, 31 December 2020

Current approach

In our view it is helpful to think of the spread of an asset return over the risk-free rate as comprising of two parts:

1. Allowance for non-credit related risks: illiquidity risk and other risks such as complexity premium for alternative long-term, illiquid assets; and
2. Allowance for credit related risk: expected credit default losses and a risk premium for uncertainty in credit losses which captures the cost of downgrade.

We note that it is difficult in practice to attribute these parts of the spread.

Under the Solvency II regime, the credit related risk element is called the Fundamental Spread (“FS”) and the non-credit related risk element is the MA, which provides compensation for illiquidity risk.

As previously stated, the premise of the MA is that as long-term cashflow matched investors, insurers are exposed to the retained risks of default and downgrade. This is reflected through the probability of default (“PD”) and cost of downgrade (“CoD”) components of the FS, subject to a long-term average spread (“LTAS”) floor and recovery assumptions of 30% in the case of default.

PD and CoD are published monthly and calibrated for each annual maturity to 30 years which are split by credit rating (“CQS”), maturity and sector (Financial or Non-Financial). PD and CoD are derived by EIOPA using the following approach^a that applies at cashflow level:

- A long-term (30-year) average credit rating transition matrix is produced based on observed, historic data. PD and CoD then reflect the cost of holding the cashflows over the lifetime of the investments by cumulatively applying the credit rating transition matrix.
- For PD, a “buy and hold” strategy is assumed. For each maturity, the expected cashflows are determined assuming the recovery rate and the cumulative credit rating transition matrix, and the cost of default is derived from these cashflows.
- For CoD, an annual rebalancing strategy is assumed where assets downgraded are replaced by an asset of the same credit rating as before downgrade. CoD reflects the cost of replacing the downgraded assets in order to preserve the original cashflows. For each maturity, the expected CoD cashflows are determined from the cumulative credit rating transition matrix (adjusted to reflect rebalancing), and CoD is derived from these cashflows.
- To partially offset double counting of risks from the different trading strategies used for PD and CoD, CoD is adjusted by the difference between cost of default calculated assuming “buy and hold” strategy minus cost of default calculated assuming the annual rebalancing strategy.
- PD is used in the PRA Matching Test 1 (the cashflow shortfall test) to reduce the asset cashflows before matching the liabilities and calculating any surpluses and shortfalls.

^a Technical documentation of the methodology to derive EIOPA’s risk-free interest rate term structures

The FS also contains a floor set to 35% of the long-term average spread (“LTAS”) which is based on 30 years of historical data. As at year-end 2020, it should be noted that the LTAS floor bites in many CQSs and maturity combinations for financial and non-financial corporate bonds.

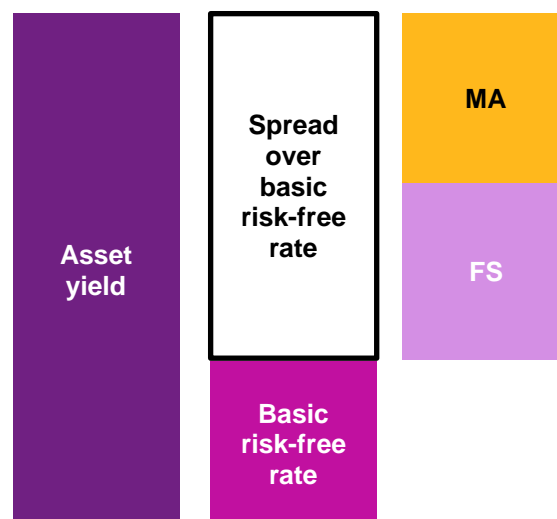
The FS acts as a countercyclical buffer during times of stress, where it intentionally captures only the credit risk, allowing the spread widening to feed through to the liability discount rate.

The MA benefit as per the description in Article 77c of the Solvency II Directive is as follows:

$$\text{Credit Spread} - \text{MAX}(\text{PD} + \text{CoD}, 35\% \text{ LTAS})$$

An illustrative decomposition of the asset yield into MA and FS under Solvency II is shown in Figure C.1.

Figure C.1: Decomposition of asset yield under the current Solvency II approach to the MA



QIS approach

The MA approach tested in PRA’s QIS replaces the CoD and LTAS floor with a CRP, as described above, which is more credit risk-sensitive due to it being based upon current credit spreads of the underlying assets held by the insurer:

- Under Scenario A, the CRP is made up of a proportion of current credit spreads (“Z-spreads”) plus a proportion of the five-year average of credit spreads. An allowance is also made for Valuation Uncertainty (“VU”) varying by International Financial Reporting Standards (“IFRS”) fair value hierarchy level.
- Under Scenarios A and B, the proportion applying to the current and average spreads is 25%, and VU adjustments are pre-specified by the PRA.
- Under Scenario B, the five-year average of credit spreads is removed from the CRP and the VU is half the level that it is for Scenario A. Both scenarios incorporate floors to the CRP and a cap is tested under Scenario A but not Scenario B.

This formulation in the QIS represents a significant change from the current approach and means that movements in asset spreads feed through directly into the FS. This approach has been designed to test making the MA more risk sensitive to an individual asset's spread based on the PRA belief that short-term spread movements provide information on the probability of the asset downgrading or defaulting.

For the purposes of the QIS, the PRA has indicated that illiquid loans and structured notes should be "treated like a bond" with the internal rating approaches continuing to specify the CQS that should apply.

Table C.1 provides a comparison between the QIS approach, the current Solvency II approach and the previous Solvency I Pillar 2 approach. As can be observed from the table, key features of how the MA would be implemented under the method being tested in the QIS are not yet clear.

Table C.1: Features of the MA under Solvency I, Solvency II and the QIS

Features of the regime	QIS 2021	Solvency II	Solvency I – Pillar 2
Asset eligibility	Not yet clear (part of the review but little detail shared so far)	<ul style="list-style-type: none"> ■ MA eligibility rules: "fixed and bond-like" (zero-pre-payment risk) ■ Prudent Person Principle ■ Barrier to entry for new assets in MA portfolio and regulatory thresholds/limits through the MA approval process 	<ul style="list-style-type: none"> ■ Formal and quantifiable investments limits for particular assets
Liability eligibility	Not yet clear (part of the review but little detail shared so far)	<ul style="list-style-type: none"> ■ Primarily annuity business for MA ■ VA for other business 	<ul style="list-style-type: none"> ■ At firm's discretion, typically applied to all business
Credit default deductions	<ul style="list-style-type: none"> ■ Approach and calibration set by PRA ■ FS set as: PD + CRP + VU 	<ul style="list-style-type: none"> ■ Approach and calibration set by EIOPA ■ FS set as: Max(PD+CoD,35% LTAS) 	<ul style="list-style-type: none"> ■ Principle-based regime with firm responsible for methodology and calibration ■ Regulatory capital add-ons
Typical asset allocations ^a	Not yet clear	<ul style="list-style-type: none"> ■ 55% gilts and corporates, ■ 45% other assets such as illiquid assets 	<ul style="list-style-type: none"> ■ 85% gilts and corporates
Portfolio management	Not yet clear	<ul style="list-style-type: none"> ■ Strict cashflow matching and management 	<ul style="list-style-type: none"> ■ Greater freedom to set ALM policy

^a We note that asset allocations have shifted reflective of the sustained lower interest rate environment.

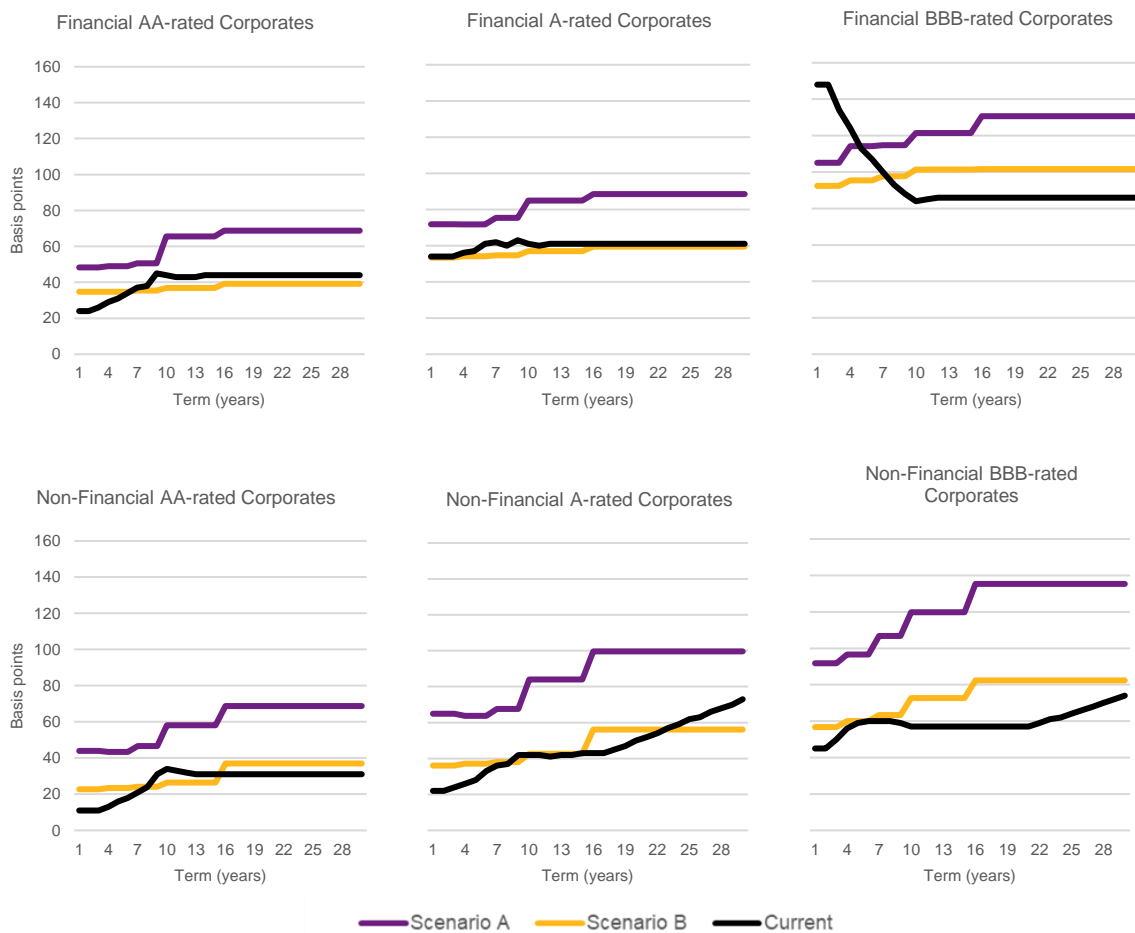
Assessment of performance

FS by sector, credit rating and term

Figure C.2 below compares the credit-related spread component (for simplicity referred to as FS in this section per current terminology) calculated using the current approach and the QIS approach (for both Scenario A and Scenario B), for corporate bond assets of different sectors, credit ratings and terms. The basis of our analysis, as well as the parameters used for CRP and VU as published in the QIS, are summarised in Appendix B.

For both Scenario A and Scenario B the QIS approach is noticeably more onerous and will result in a lower MA for all participants whatever the investment allocations.

Figure C.2: Estimated FS based on WTW analysis as at 31 December 2020^a



From the charts above it is observed that Non-Financials appear relatively harder hit than Financials across all ratings and especially for high credit quality shorter duration assets. BBB-rated Non-Financials make up a disproportionately large part of the GBP corporate bond universe. On the other hand, the EIOPA approach is more penal for short duration BBB-rated Financials. This relative impact

^a The FS under Scenario A and B has been derived from Z-spread data that has been sourced from HIS Markit iBoxx. iBoxx indices are based on terms 1-3, 3-5, 5-7, 7-10, 10-15 and 15+, resulting in the stepped nature of the term structure chart levelling out after 15 years. The FS allows for VU and is based off SONIA by adjusting the iBoxx data with the gilts and SONIA difference.

on differing assets has not been fully considered by the QIS with firms having very limited time to consider any change to asset allocations as part of the exercise.

Were a new regime to be imposed with such severe differences in relative risk, firms may want to consider rebalancing the portfolio where certain assets look less / more attractive under the revised MA. Such action needs to be managed carefully, so as to avoid unintended consequences, also considering investment views of relative risk as part of efficient portfolio management and the differing potential spread volatility of assets which would need to be considered.

Additionally, it should be noted that the PRA QIS specification includes a floor on the CRP which is biting under Scenario B. The information provided for this floor, as well as the five-year average spreads applying in Scenario A, are specified with no term structure, with the parameterisation varying only by sector and CQS. This will therefore not allow for the correct risk sensitivity with short- and long-dated holdings having very differing risk profiles.

It is not clear whether this lack of granularity is intended only as a simplification for the QIS data gathering. If carried through to final policy options, there is a potential this may lead to sub-optimal allocations from a risk point of view. We are of the view that the results of the QIS scenarios on firms' MA presented in Section 2 need to be considered noting these limitations.

Furthermore, there should be a distinction between what CRP is reflected in market prices on a given day as opposed to what financial resources an insurer should hold to ensure it can meet its obligations over the lifetime of the business.

We consider the impact on an illustrative portfolio of assets below under the specified QIS sensitivities.

Illustrative example of MA movement under sensitivities

To illustrate how the QIS approach for FS behaves under various conditions compared to the current approach, we have produced analyses on an illustrative MA portfolio under the following sensitivities:

- **Mass downgrade sensitivity:** A sensitivity where a proportion of the portfolio experiences instantaneous single-CQS downgrade. The proportions for each CQS are summarised in Appendix B.
- **Credit spread widening scenario 1:** The “moderate widening” credit spread sensitivity as specified in the QIS. The added spreads are summarised in Appendix B.
- **Credit spread widening scenario 2:** The “extreme widening” credit spread sensitivity as specified in the QIS. The added spreads are summarised in Appendix B.
- **Downgrade and spread widening scenario:** The credit spread and downgrade sensitivity specified in the QIS with the following two events occurring at the same time:
 - Mass downgrade sensitivity as specified above
 - Credit spread widening sensitivity 2 as specified above

When carrying out the analyses we have made the following assumptions:

- We have assumed an illustrative asset allocation of fixed-income assets typical to an UK MA fund based on our industry experience, as shown in Table C.2:

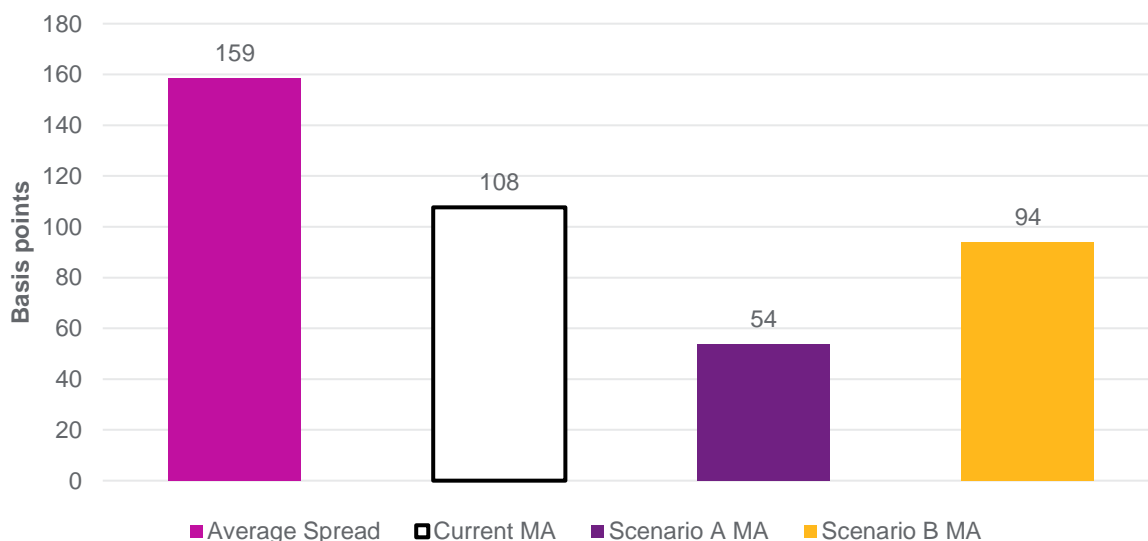
Table C.1: Asset allocations to credit ratings assumed for the sensitivity analyses

Rating	Financial	Non-Financial	Total
AAA	2.5%	5%	7.5%
AA	2.5%	5%	7.5%
A	15%	30%	45%
BBB	10%	30%	40%
All	30%	70%	100%

- We have assumed 50% of A/BBB^a assets are allocated to illiquid assets, with +100 basis points spread uplift against corporate bonds with the same credit rating (i.e. a 42.5% allocation to illiquid assets)
- We calculated the weighted average FS of the portfolio assuming an average duration typical of a MA fund of 10 to 15 years.
- The MA benefit is estimated by taking the difference between weighted average spread and weighted average FS of the portfolio.

Figure C.3 below shows the MA and FS under the current approach as well as under the QIS scenarios.

Figure C.3: MA and FS for the illustrative portfolio under the QIS scenarios



The results above show that the MA calculated using the QIS approaches is lower than under the current approach, with Scenario A having a greater impact (50% reduction in MA in basis points terms)

^a Assuming these illiquid assets have internal ratings that satisfies the requirements in SS3/17

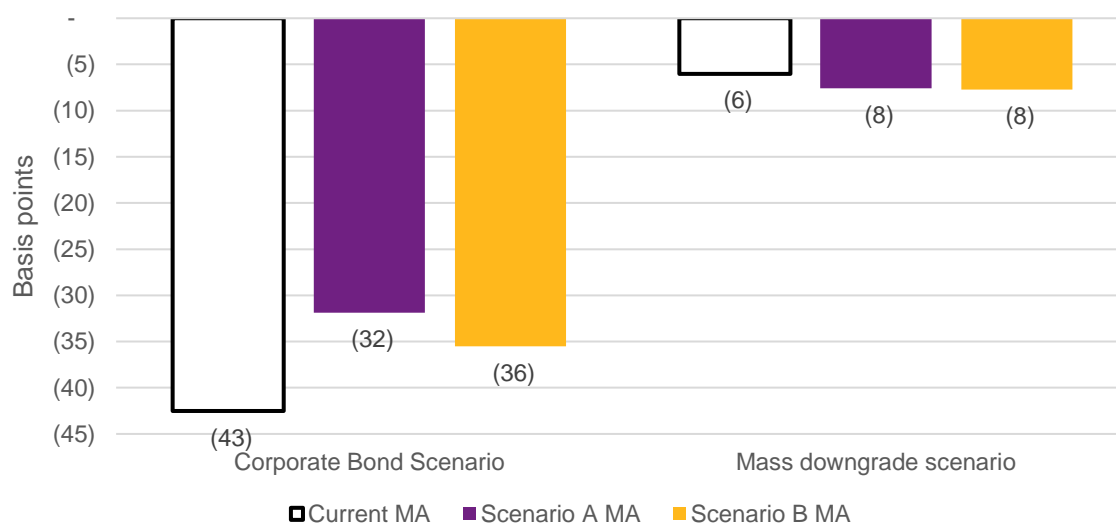
compared to Scenario B (13% reduction to MA in basis points terms). This is a function of the calibration strength of Scenario A and Scenario B in the QIS. The FS chart also shows that as at year-end 2020 Scenario A FS is closer to 75% of LTAS, which happens to be the LTAS floor proposed initially for Solvency II, but was later changed to 35% due to being viewed as too onerous as part of the final stages of the Solvency II negotiations on the MA which were led by the UK regulator. On the other hand, Scenario B FS is closer to the current FS that is subject to the 35% LTAS floor but with increased volatility as shown in the sensitivities below.

Table C.3 below shows the MA under the sensitivities set out above using the current approach^a and the QIS Scenario A and B. Figure C.4 then shows the changes in MA under a mass downgrade scenario. . The resulting QIS MA in Scenario A and B from holding a corporate bond only portfolio has also been shown as an additional scenario for comparative purpose.

Table C.2: MA under the sensitivities for the current approach and the QIS scenarios

	Base portfolio	Corporate bond only portfolio ^b	Mass downgrade sensitivity	Credit spread sensitivity 1	Credit spread sensitivity 2	Downgrade and credit spread sensitivity
Average Spread	159	116	159	224	622	622
Current MA	108	65	102	172	566	559
Scenario A MA	54	22	46	100	371	350
Scenario B MA	94	59	86	148	446	430

Figure C.4: Changes in the MA under corporate bond and mass downgrade sensitivities



Under Scenario A our representative vanilla corporate bond only portfolio would have a much smaller MA benefit of only 22 basis points, giving very limited uplift versus the Solvency II VA, even though the MA is more onerous in terms of compliance and asset choice (81% of the portfolio average spread is

^a For the current MA approach, we have used the SONIA rates for modelling purposes

^b The corporate bond only result represents a change to the allocation of assets in the portfolio.

credit default-related well above the top end of the range typically referred to in academic studies). If something close to the magnitude of Scenario A became policy, this would potentially render the additional effort and cost of gaining approval for and establishing an approved portfolio per the requirements of PRA's Supervisory July 2018 Statement SS7/18 Solvency II: Matching Adjustment²⁴ significantly less worthwhile, especially if the reduced MA in the base balance sheet also translates into a reduced level of MA absorbance in spread widening scenarios in the SCR.

When considering the mass downgrade scenario alone, the QIS scenarios do not appear to create any significant additional migration cost relative to the existing FS calibration with a relatively small 2 basis points additional loss of MA. This suggests the relative spread differentials between CQS is similar at year-end 2020 as over the longer term. This may not always, however, be the case and we would recommend a need to fully test any material change in MA calculation approach over differing economic periods rather than at one single point in time.

Under spread widening scenarios, the MA calculated using the QIS approach will experience a more limited increase than the MA calculated using the current approach. This is because the credit deduction calculated by the QIS approach has a greater link to spread movement (25% of the Z-spread movement applies in both Scenario A and Scenario B plus an additional increase in the five-year average in Scenario A, the latter of which we note that the QIS did not allow for).

Figure C.5 below shows the MA offset (MA increase as a percentage of spread increase) for the three spread widening scenarios.

Figure C.5: MA offset as a percentage of spread widening

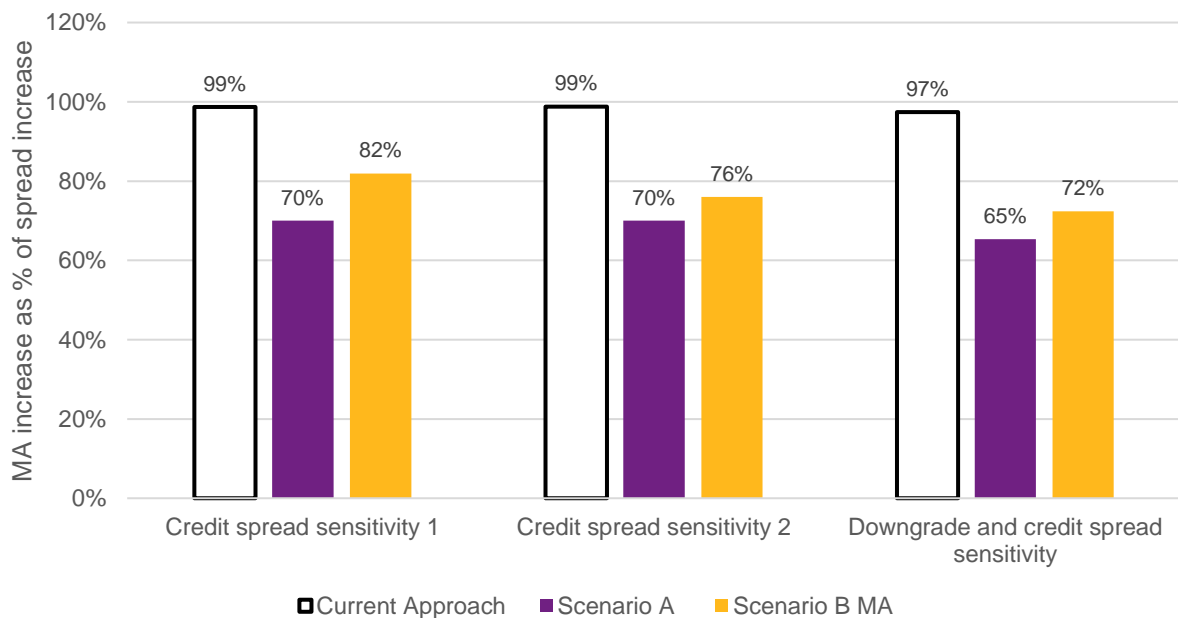


Table C.4 below demonstrates the impact of this by showing the percentage increase in Best Estimate Liabilities (“BEL”) for a typical book of annuity business caused by the reduction in MA under QIS scenarios A and B with the above sensitivities^a.

Table C.3: Estimated increase in BEL as a result of the reduced MA benefit under the QIS scenarios and sensitivities

% of BEL increases	Base portfolio	Corporate bond only portfolio	Mass downgrade sensitivity	Credit spread sensitivity 1	Credit spread sensitivity 2	Downgrade and credit spread sensitivity
Scenario A	6.7%	5.4%	6.9%	9.1%	23.4%	25.3%
Scenario B	1.7%	0.8%	1.9%	3.1%	14.9%	16.2%

The BEL impacts as shown above are proportionally larger under more severe scenarios, similarly due to the connection between FS and credit spread under the QIS approach. In all sensitivities, Scenario A is more impactful than Scenario B, as expected, mainly due to the linkage to 25% of five-year average spreads in addition to 25% of current spreads. Whilst less extreme, the impact of adopting the QIS approach is still significant for Scenario B, and is more noticeable under more severe scenarios.

The impact of revisions to the base MA for SCR calculations is currently highly unclear with the implication above that, in a combined 1-in-200 downgrade and credit spread combined sensitivity, the capital should also increase (due to reduced levels of MA absorbency). The SCR impacts have not been tested through the QIS exercise, with the QIS instructions asking firms to indicate qualitatively how they anticipated the SCR to move.

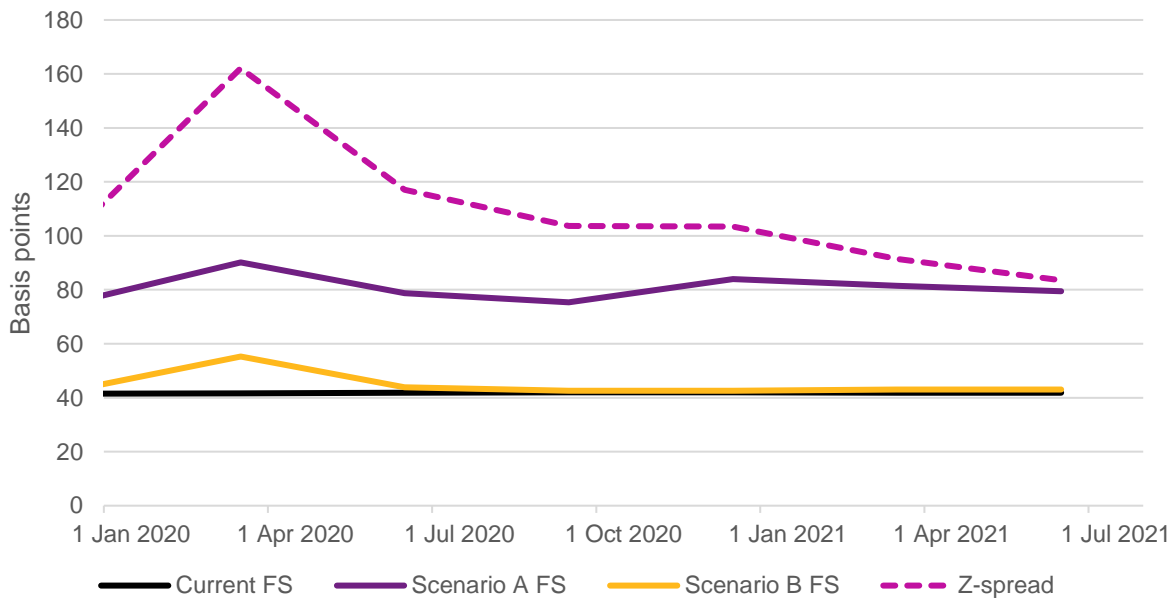
Assessment of the potential impact is very difficult to do with internal models having bespoke firm by firm credit modelling approaches and with no indication of how the PRA’s July 2018 Supervisory Statement SS8/18 *Solvency II: Internal Models and the Matching Adjustment* might be updated to allow for the revised base calculation methodology.²⁵

^a Using a spread x duration approach assuming 12.5y average duration of the portfolio. TMTP has not been considered in the analysis.

Impact of the pandemic

The effects of the QIS on the MA appear particularly clear for Scenario A when we look at its performance over the period of the pandemic, as shown in Figure C.6 below.

Figure C.6: Historical estimation of FS for A-rated Non-Financial Corporate Bonds of 10- to 15-year duration^a



Observations on the results over this period are as follows:

- One possible interpretation of the increase in spreads observed in March and April 2020 (and shown in Figure C.6) is that these reflect a forward-looking view of (higher) long-term default and downgrade risk amongst credit market participants. The QIS specification reflects such a view; the parameterisation of the QIS would have had a substantial impact on insurers' balance sheets over this period.
- Spreads have since narrowed and, at the time of writing, sit below pre-COVID-19 levels. Figure C.5 illustrates a relatively common pattern for credit stresses i.e. that the spike seen in the first quarter of 2020 was predominantly fear or sentiment driven as opposed to a change in long-term expectation for default and downgrade costs. The proposed current spread linkage would have introduced a temporary spike in FS at the height of crisis, putting balance sheets temporarily under stress and encouraging pro-cyclical behaviour.
- Where markets shift and credit spreads temporarily widen and then narrow – as seen at the start of the COVID-19 pandemic – the MA set out in the QIS has a reduced mitigating effect against short-term market movements since the CRP moves more in line with observed market spreads.
- For a typical 10- to 15-year A-rated corporate bond there was approximately a 15 basis points increase in the CRP in March and April 2020 which soon reverted. This additional 15 basis points cost of downgrade allowance is equivalent to the gap between A and BBB-rated FS under the existing regime. The QIS approach therefore can be viewed as making an impact on balance sheets akin to the impact from an A-rated holding downgrading a full letter to BBB.

^a The FS under Scenario A and B has been derived from Z-spread index data that has been sourced from iBoxx. The QIS floor has been kept constant over historical periods as per the tables in A2.5 of the QIS instructions.

- From 2020 transitions data it can be observed that circa 10% of Financials and 25% of Non-Financials did in fact downgrade²⁶, which will have increased the FS within MA portfolios. This represents a significant increase in downgrades from 2019 levels, with the impact of the economic shock considered by rating agencies during and after the onset of the pandemic. The QIS approach would introduce a much larger allowance for downgrades than were observed over this period. Rating changes update within a sufficient time for assessing long-term credit risks for long duration business and are a more appropriate reflection of credit risk than short term spread movements.
- Testing this potential design option when spreads are at such low historic levels may not present a complete picture, so further examination is required of the behaviour of an alternative approach as spreads widen.
- If using credit ratings as an assessment of forward-looking credit risk, after a shock event it might take 3-4 months for downgrades to feed through. This seems quite proportionate, avoiding taking hasty action as soon as a shock occurs, and taking account of the new information about prospective credit risk.

Firms also publicly described in their annual reports how defensively positioned trading programmes, rigorous risk management practices and stress testing were adopted to mitigate the potential costs from downgrades in their bond portfolios. Published solvency ratios were not adversely affected through the period due to the workings of the current regulatory regime. If the QIS approach was followed during the March to April 2020 period, in order to protect solvency positions, insurers would have needed to make use of a different risk management approach involving complex and costly hedging programmes to protect themselves against short term spread volatility. The Solvency II provisions on the MA (as designed through the Omnibus II agreement) are for this very purpose – to allow the regime to recognise the risk management benefits of appropriately matching asset and liability cashflows, without the need for greater use of derivatives to reduce “artificial” spread volatility.

Treatment of illiquid assets

For many illiquid assets, due to higher expected recovery rates, the expected loss is significantly lower than on a comparable corporate bond. In line with the current approach, the QIS maintains the assumed 30% recovery assumption for all assets and so retains the existing prudence.

Alongside this, the additional yield provided by illiquid assets over and above a similarly rated corporate (the “loan to bond spread”) results in an increased QIS CRP owing to the simple single percentage of spread-based proxy for the cost of downgrade. Illiquid assets are often inherently complex and difficult to value. An investor requires sufficient additional reward from investing relative to more liquid comparable investments otherwise the asset will not be viewed as efficient. The additional work required to develop a deep understanding of the asset class and its risk characteristics would not be rewarded without such a premium. This element can be viewed as a complexity premium (as opposed to purely illiquidity premium). Under the PRA QIS approach 25% of this complexity premium as well as the illiquidity premium is assumed to be part credit loss allowance. This has very limited justification especially given the higher expected recovery compared to corporates noted above and appears to represent excessive prudence with a double counting of risk.

Added to this, the QIS also includes a further VU component in the credit loss allowance. This has been set with an equal allowance for corporate bonds and illiquid holdings and so lacks suitable differentiation. The VU is in effect a prudent margin added to best estimate to skew the valuation on the side of prudence. This is not consistent with Solvency II Directive Article 75(1)(a) requirements for

assets to be valued at the value at which a third party would buy them nor is it clear why it is suitable to make allowance for this as a deduction to MA – rather than say, accounting for valuation uncertainty as part of the SCR.

Concluding remarks

The PRA approach to the MA in the QIS lacks sophistication, does not adequately allow for the distinct features of different asset classes for the additional complexity it introduces and generates significantly increased balance sheet volatility. This would require increased use of costly and complex hedging programmes to manage against the exposure to asset price movements introduced. Exposure to short-term price fluctuations will reduce UK insurers' abilities to act as long-term investors when following closely cashflow matched investment strategies and avoiding the forced sales of assets unnecessarily in market down turns.

This was identified as one of the benefits of the MA design introduced by Omnibus II in PRA's cost benefit analysis within Consultation Paper CP16/14 Transposition of Solvency II Part III²⁷. The life insurance industry's position as a key long-term investor is much needed to support the growth of the UK economy and levelling-up agenda; key objectives of Solvency II reforms.

In summary, we have listed the following concluding remarks on the new QIS MA approach:

- The QIS approach, with its proposal to link the FS to current spreads, would, had it then been in force, have introduced additional and unhelpful volatility and stress on insurers' balance sheets during the first half of 2020 when spreads temporarily spiked.
- Subsequent experience suggests that this spike in spread wasn't associated with a change in long-term expectations for downgrade and default losses and seems to have been caused by temporary sentiment / fear which quickly was allayed due to the government and central bank intervention and the successful vaccine and medical developments. Spreads have reverted to levels lower than pre-COVID-19. It is unclear this represents a reduced long-term expectation for default and downgrade losses, suggesting percentage of spread is not a good indicator to use at a macro level.
- It is unclear why the PRA consider it would be reasonable to allow for a material increase in the expectation of downgrade from a spike in spreads as a long-term forward-looking view without any ability for exercising judgment. Only material sustained movements in the underlying riskiness of the holding should be accounted for as is reflected in decisions over rating migrations.
- The five-year average spreads, as well as the floor components of the CRP, do not contain a term structure and do therefore not allow for the correct risk sensitivity with short and long-dated holdings having very differing spread behaviours. This is a limitation relative to the LTAS floor of the existing approach.
- In our view, there is insufficient granularity in the parameterisation for illiquid assets in both the current FS and that the QIS FS approach of linking to current spreads also does not provide sufficient granularity as it is linked to a market level spread, which ignores the nuances of individual assets and asset classes. This has also not been revisited through the re-examination.
 - The prescribed 30% recovery rate assumption in the existing regime is crude and not applicable across all asset types;
 - The buy-and-hold assumption used in the expected default calculation increases the credit default loss relative to the annual rebalancing approach used in the Solvency II FS calculation.

This additional cost was partially reversed out in the cost of downgrade element to acknowledge a double counting of risk as part of the finalisation of the MA. Noting where this reversal was applied, the more prudent approach for the expected default component (where assets are assumed to progress to default with no rebalancing) is retained in the QIS FS;

- For corporate bond holdings, firms will typically follow more of a buy and maintain approach in line with efficient portfolio management trading out of assets to mitigate default losses. For unrated illiquid holdings, firms will more typically follow a buy and hold approach with less likelihood of trading. This is not because the assets can never be sold but because it is faster and cheaper to sell other assets when necessary. This differential in investment approach between liquid and illiquid holdings has not been considered in either the existing FS calculation or the QIS approach; and
- The addition of a VU component with Financial / Non-Financial sector granularity similarly lacks suitable differentiation applying equally to corporate bonds and illiquids.
- More generally, we believe that the FS is not suitably adaptable for each asset class, with insufficient granularity in the sectoral definitions. For example, there is no specific consideration for collateralised assets such as a structured portfolio of ERMs where a bespoke regulatory Effective Value Test (“EVT”) validation has been implemented through Supervisory Statement SS3/17 Solvency II: illiquid unrated assets²⁸. It is not clear whether or how the EVT would continue to operate if the QIS MA methodology became a policy option. The combined spread volatility of the QIS approach and interest rate volatility of the EVT will not correspond with the true underlying ERM risk exposure to UK property risk, creating a very difficult risk management problem.
- If the MA calculation approach were to be materially revised, consideration would be needed to find alternative modifications untested by the QIS exercise. This should recognise that there are areas of prudence that already exist in the existing framework while noting a need to better accommodate the potentially differing dynamics of illiquid assets, in order to give a regime suitable for the UK market.
- Before any revision is considered there should first be some objective analysis that demonstrates whether or not the current design presents any material deficiency from a risk perspective at a total MAP level (i.e., including allowance for credit SCR) that would warrant reform. So far, the PRA has not provided any objective analysis in this respect and its proposal seems based on conceptual views.

Appendix D: Analysis of the Risk Margin

Summary of key points

This appendix introduces the RM concept under Solvency II, summarises the two approaches explored in the PRA QIS and analyses the RM results for annuities of varying duration and at different periods of time.

The PRA's stated intention for RM choices in the QIS was to take an open-minded approach and test two well-known designs, with no preference for a specific design. The RM methods tested in the QIS are drawn from approaches that are being considered elsewhere, namely by the International Association of Insurance Supervisors ("IAIS") and by EIOPA.

We note the following key points:

- The QIS Scenario A approach is recognised as being the same as the MOCE^a under the ICS whilst the tapered cost of capital approach in Scenario B was proposed by EIOPA under its review of Solvency II – although the helpful amendments proposed by the European Commission have been ignored. The EC's more recently proposed tapering approach has a more generous calibration than the one tested in the QIS, providing approximately a further 17% reduction in RM for an in-payment annuity, and removing the floor for the lambda parameter.
- RM as a percentage of BEL has grown significantly as interest rates have fallen. This has been exacerbated by increases in the amount of capital held against non-hedgeable risks. We note that firms contend that longevity is a materially hedgeable risk and argue that its contribution to non-hedgeable risk capital should be reduced.
- Under the Scenario A percentile approach, writers of shorter duration business could potentially see the RM become greater than under the current approach. This is a clear failing of the approach which could be moderated but not eliminated by reducing the calibration for life insurers from 85th percentile to 75th. The MOCE incorporates a margin per unit of risk where the unit is defined by the percentile.
- RM as a percentage of BEL has grown significantly as interest rates have fallen. This has been exacerbated by increases in the amount of capital held against non-hedgeable risks. We note that firms contend that longevity is a materially hedgeable risk and argue that its contribution to non-hedgeable risk capital should be reduced.

Introduction

Under the rules of Solvency II, the RM is required to be held, representing the amount to be added to BEL to align technical provisions with the amount another insurer would require to take on the business in an arm's length transaction.

The definition of the RM is set out in the Solvency II Directive. Article 77(4) in the Solvency II Directive states that insurance and reinsurance undertakings shall value the best estimate and the risk margin separately, while Article 76(2) states that the value of technical provisions shall correspond to the current amount insurance and reinsurance undertakings would have to pay if they were to transfer

^a Also known as the "Percentile-MOCE" under the ICS.

their insurance and reinsurance obligations immediately to another insurance or reinsurance undertaking.

The TMTP mechanism in Solvency II helps smooth in the impact of the transition from Solvency I to Solvency II over a 16-year period. This mechanism has offset much of the RM attributed to liabilities acquired prior to the introduction of Solvency II. For liabilities acquired after 2016, insurers have typically required more material risk transfer, with insurers having transferred up to 90% of liabilities through longevity reinsurance schemes.

The value of the RM, before allowing for TMTP, is estimated at £41.5 billion for UK insurers and reinsurers as at year-end 2019, and the value of RM net of TMTP is £19.9 billion.²⁹

Implications for annuity providers

Over time, as interest rates have fallen and life expectancies have risen, the RM has become a more material component of insurers' balance sheets, particularly for longer-term business. This has led to several challenges and changes in business practice including:

- **Asset-Liability Management:** Insurers have needed to decide whether to match and / or hedge the BEL or the technical provisions that include the RM. The RM is a construct whose cashflows have no real world meaning and there is some reluctance to match to it in the knowledge that it will be released over the long term.
- **Longevity Risk Transfer:** The bigger the RM relative to the rest of the technical provisions, the greater the adverse impact on product pricing and the more insurers are incentivised to reduce the RM by transfer of longevity risk to a company in a jurisdiction with less onerous requirements. A key factor in the growth of the longevity reinsurance market has been that the RM is too large for relevant primary insurance business (mainly immediate annuities).

Current approach

As implemented in Solvency II, the RM represents the cost to the insurer of providing capital to cover its SCR for non-hedgeable risks over the expected lifetime of the business. It is calculated by projecting the costs of holding capital in respect of non-hedgeable risks (SCR'_t) over the lifetime of the business, based on a fixed cost of capital rate ("CoC"), and then discounting by the Solvency II risk-free rate (r_t) to find the present value of the costs.

The current RM approach is formulated in Article 37(1) of the Solvency II Delegated Acts as:

$$CoC. \sum_{t \geq 0} \frac{SCR'_t}{(1 + r_{t+1})^{t+1}}$$

Under this approach, the RM is sensitive to changes in non-hedgeable risk capital and the risk-free rate.

QIS approach

The RM methods tested in the QIS are drawn from approaches that are being considered elsewhere, namely by the International Association of Insurance Supervisors (“IAIS”) and by EIOPA:

- Scenario A follows the Margin Over Current Estimate (“MOCE”) approach used for confidential reporting under the Insurance Capital Standard (“ICS”)^a. This approach sets the RM as a percentile of non-hedgeable SCR, with the percentiles in the QIS being set to 85th for life business and 65th for non-life.
- Scenario B follows a cost of capital approach similar to the current method except that a factor is introduced which steadily tapers off future costs of capital, subject to a floor on the percentage reduction applied. This was proposed by EIOPA in the European Commission (“EC”) review of Solvency II. Scenario B is calibrated such that future costs of capital are reduced by 2.5% per annum subject to a cumulative reduction of 50%.

Scenario A offers a simpler approach to evaluating the RM, does not have the sensitivity to interest rates that the current method has and is expected to reduce the amount of the RM for annuities (but not for all firms, see the following subsection). This approach was tested in QIS2 in 2006 along with the cost-of-capital approach (which is what was ultimately adopted) and at that time resulted in similar values. This contrasts to the current position where the cost-of-capital approach results in a much larger RM than the QIS2 alternative (MOCE) approach because of the impact of the fall in interest rates.

The RM calculation for Scenario B is a cost of capital approach and therefore similar to the existing Solvency II RM approach but incorporates a “lambda” factor that reduces the cost of capital at long durations, which has the effect of reducing the RM and its sensitivity to interest rates. The lambda factor is understood to be a method of accounting for a degree of interdependence in the emergence of future non-hedgeable risks. The approach is formulated in the same manner as the approach in EIOPA’s opinion³⁰ under the Solvency II review as:

$$CoC. \sum_{t \geq 0} \frac{SCR'_t \cdot \max(\lambda^t, 0.5)}{(1 + r_{t+1})^{t+1}}, \text{ where } \lambda = 0.975$$

At the time of writing, the EC is proposing a less onerous RM calibration under the Solvency II review for the EU compared to that proposed by EIOPA. The EC proposes a 5% CoC (rather than 6%) and to eliminate the floor (rather than 50%).¹² Should the EC’s proposal succeed, this would make Scenario B in the QIS more onerous than Europe’s Solvency II in terms of the RM.

As stated previously, the RM was a new concept for insurers transitioning between Solvency I and Solvency II, requiring firms to hold technical provisions which exceeded BEL. However, under Solvency I the reserving basis included margins on uncertain assumptions to reflect a degree of implicit prudence in the basis which led to insurers holding provisions that exceeded a “best estimate”

^a The ICS has been developed by the International Association of Insurance Supervisors (“IAIS”) to apply to Internationally Active Insurance Groups (“IAIGs”). ICS Version 2.0 was adopted by the IAIS in November 2019 and is currently in a monitoring period. ICS may go through further changes before any decision to adopt it.

level. Table D.1 provides a comparison between the QIS approach, the current Solvency II approach and the previous Solvency I Pillar 2 approach.

Table D.1: Features of the RM under Solvency I, Solvency II and the QIS

Features of the regime	QIS 2021	Solvency II	Solvency I
Methodology	Two methods being explored: <ul style="list-style-type: none"> ■ Percentile of VaR ■ Tapered Cost of Capital 	<ul style="list-style-type: none"> ■ Cost of Capital 	<ul style="list-style-type: none"> ■ No specific element of RM but implicit prudence in Pillar 1 assumptions
Principle	<ul style="list-style-type: none"> ■ Run-off ■ Transfer value 	<ul style="list-style-type: none"> ■ Transfer value 	<ul style="list-style-type: none"> ■ Prudence (Pillar 1)
Calibration	85 th percentile for Life firms	6% CoC, 97.5% λ and 50% floor	<ul style="list-style-type: none"> ■ Under review ■ Proposal to change to tapered approach with 5% CoC and no floor

Assessment of performance

Illustrative example of RM for annuity portfolios

To illustrate how the RM results under the QIS scenarios compare to the current approach, we have produced analyses based on illustrative blocks of in-payment and deferred annuities.

When carrying out the analyses we have made the following assumptions:

- Only longevity risks form the non-hedgeable risks for the purposes of the RM and no diversification effect is assumed. For simplicity we have excluded any operational risk allowance.
- Basic risk-free rates are used for discounting liabilities. No allowance for MA or Volatility Adjustment (“VA”) is included in the discount rate for BEL and RM^a.
- The illustrative in-payment and deferred annuity portfolios have liability durations of 12.5 years and 25 years respectively. In order to extrapolate to illustrative alternative portfolio durations we apply a scaling that reduces the liabilities linearly over time.
- The RM for the two portfolios represents 8.4% and 14.2% of the BEL under the current approach to the RM. No reinsurance or TMTPs is assumed to be in effect for these liabilities.

We have calculated the RM under the QIS scenarios for this annuity portfolio and expressed them as a percentage of the current RM. Additionally, we have included calculations that use a percentile approach similar to Scenario A but using a 75th percentile calibration (the calibration which was proposed in Solvency II QIS2) rather than 85th and the tapered cost of capital approach with the cost

^a We note that the PRA permits firms to include the MA or VA in the discount rate for the purposes of the QIS.

of capital rate set to 5% instead of 6% and no floor on the cumulative taper (the latest calibration proposed by the EC under its review of Solvency II). The results are provided in Table D.2.

Table D.2: Relative value of the RM for illustrative in-payment and deferred annuity portfolios under the QIS scenarios and alternative formulation for different liabilities durations

Liability duration ^a	Current	Scenario A (Percentile)	Scenario B (Tapered Cost of Capital)	Percentile 75 th	Tapered Cost of Capital 5% CoC rate, no floor	Tapered Cost of Capital 85% lambda, no floor
In-payment annuity						
1.0	100%	692%	98%	450%	82%	90%
2.5	100%	275%	96%	179%	80%	76%
5.0	100%	138%	91%	90%	76%	60%
10.0	100%	69%	83%	45%	70%	42%
12.5	100%	55%	81%	36%	67%	36%
Deferred annuity						
20.0	100%	34%	76%	22%	63%	37%
25.0	100%	28%	72%	18%	59%	33%

We observe from Table D.2 that for the annuity portfolios we have examined:

- There are large differences between the outcomes under Scenario A and Scenario B for all portfolios. The percentile-based RM significantly increases or decreases the absolute value of the RM depending on portfolio duration.
- The percentile approach under QIS Scenario A results in up to approximately a 50% reduction in in-payment annuity RM compared to the current approach and 70% for deferred annuities. At a duration of one year the RM increases almost seven-fold (for this duration, a calibration of 56th percentile brings the result in line with that of the tapered cost of capital approach).
- The tapered cost of capital approach under QIS Scenario B results in up to a 20% reduction in in-payment annuity RM compared to the current approach and 30% for deferred annuities. This approach always leads to a reduction in RM regardless of duration.
- The percentile approach using a 75th percentile rather than the 85th percentile used in Scenario A results in up to a 65% reduction in the in-payment annuity RM and over 80% for deferred annuities. In this context, it is worth noting that the QIS proposals for non-life business use the 65th percentile and so, relatively speaking, this business would have much lower RM
- The tapered cost of capital approach using a 5% cost of capital rate and no floor on the cumulative tapering results in a reduction of 33% for the 12.5-year in-payment annuity and around 40% for the 25-year deferred annuity. Adopting a lambda factor of 85% and no floor results in a 64% reduction in RM for the in-payment annuity and 77% for the deferred annuity.

^a The RM as a percentage of BEL is lower for shorter duration annuities (e.g. 0.9% for five-year duration in-payment annuity and 6.2% for 20-year duration deferred annuity).

RM as a percentage of BEL over time

In order to illustrate in a highly simplified manner the increase in the RM that has been experienced since the conception of the cost of capital approach to the RM for Solvency II, we have used the 12.5-year duration in-payment annuity and the 25-year duration deferred annuity portfolios as above and applied discounting using the prevailing basic risk-free rates (without the MA) as at 31 December 2020, 2015 and 2006. For risk-free rates as at 31 December 2006, the discount rate is derived from the swap rates without credit risk adjustment or an ultimate forward rate^a. Results are shown in Table D.3.

Table D.3: Changes in RM as a percentage of BEL for the illustrative in-payment and deferred annuity portfolios under the end-2020, end-2015 and end-2006 risk-free rates

	In-payment annuity		Deferred annuity	
	RM as % of BEL	Change in RM as % of BEL (relative to end-2006)	RM as % of BEL	Change in RM as % of BEL (relative to end-2006)
Current RM on end-2020 basic risk-free rates				
Current	8.4%	176%	14.2%	175%
Scenario A	4.6%	139%	3.9%	146%
Scenario B	6.8%	171%	10.2%	169%
Current RM on end-2015 basic risk-free rates				
Current	6.4%	135%	10.8%	134%
Scenario A	4.0%	119%	3.3%	122%
Scenario B	5.3%	133%	7.9%	131%
Current RM on end-2006 LIBOR swap-based rates				
Current	4.8%	100%	8.1%	100%
Scenario A	3.3%	100%	2.7%	100%
Scenario B	4.0%	100%	6.0%	100%

We can see from this analysis that the RM as a percentage of BEL has grown significantly since 2006 when the cost-of-capital approach was first considered for use under Solvency II – from 4.8% to 8.4% and 6.0% to 14.2% for in-payment and deferred annuities respectively^b. The change under Scenario A (the percentile approach) is much lower (3.3% to 4.6% and 2.7% to 3.9%) than under the current approach or Scenario B, illustrating that this approach is significantly less sensitive to movements in interest rates. This is especially marked for deferred annuity business because of their very long durations.

^a The Ultimate Forward Rate ("UFR") is the rate which market data is extrapolated to derive the interest rate term-structure at long durations. The UFR is equal to the sum of the expected real rate and an estimation of the expected long-term inflation rate.

^b Notably, the RM as a percentage of BEL for the deferred annuity becomes lower than that of the in-payment annuity under Scenario A due to the more pronounced effect of the percentile approach for the longest duration liabilities.

Short duration business

Writers of shorter duration business could potentially see the RM under Scenario A become greater than under the current approach. This is an outcome that runs contrary to expectations and the collective desire to reduce the RM.¹

As a simple illustration, for a firm with existing business of duration of around one year, the RM would increase by approximately 600% of current levels.^a For such business, the existing RM is usually at a very low level, however the same principle would apply for other short duration liabilities under the percentile approach and could result in higher technical provisions for firms with business of duration up to around six to seven years. This suggests that the percentile approach could have significant implications for firms with group protection business, funds in run-off or mature liabilities. If adopting the percentile approach, a term dependent percentile might be required to accommodate shorter duration and run-off business. In this regard we note that short term protection business such as group life and income protection products are similar in nature to many Non-life business – short-term risk protection. However, QIS MOCE proposals assume different percentiles (85th and 65th percentile for life and non-life respectively) with the rationale for this being unspecified.

Under the tapered cost of capital approach (Scenario B), firms with shorter duration liabilities would expect a reduction in RM relative to the current approach, however this would be more modest than for firms with longer duration liabilities as the tapering is more impactful at longer durations.

Concluding remarks

In summary, we have listed the following concluding remarks on the new QIS RM approaches based on the indicative analysis described in this appendix:

- RM as a percentage of BEL has grown significantly since 2006 when the cost-of-capital approach was first considered for use under Solvency II, nearly doubling from 4.8% to 8.4% per our simple illustrative example for an in-payment annuity..
- The change in RM as a percentage of BEL in response to movements in interest rates under Scenario A (the percentile approach) is much lower than under the current approach or Scenario B, illustrating that this approach is significantly less sensitive to movements in interest rates.
- The current RM approach has a number of limitations, particularly for longer-term business and there is widespread acknowledgement that change is needed. As noted above, it has increased considerably since it was first considered under Solvency II due to the fall in (and excessive sensitivity to) interest rates. This has long been widely accepted as a key area to address through the UK reform to Solvency II.
- There is very limited data available outside of reinsurance transactions to use to assess the appropriate level of RM. For insurance liabilities in isolation, the “transfer value” principle is supported by no market data for calibration, however it is clear that the incentive to transfer risk remains under the existing cost of capital approach.
- The percentile approach tested in the QIS results in approximately a 50% reduction in RM for a notional in-payment annuity to 4.6% of BEL in our illustrative example (close to the 4.8% as per

^a Assuming the current RM is approximately 6% of non-hedgeable SCR for business of duration around one year and applying the approximate 40% factor implied under the percentile calculation for Scenario A demonstrates that the RM has the potential to rise to around 6.7 (40% / 6%) of existing levels.

the current cost of capital approach as at end 2006 and 4% per the Scenario B tapered approach) and has much reduced interest rate sensitivity compared to the cost of capital approaches.

- The percentile used for the Scenario A approach could, however, lead to firms with short duration business holding higher technical provisions than currently. The use of a materially higher percentile than for non-life business (in contrast to what was tested in QIS2 of Solvency II) has not been fully justified. There would appear to be strong justification for using a lower percentile for shorter duration life business.
- The tapered cost of capital approach tested under the QIS results in approximately a 20% reduction in RM for a notional long-term annuity, but would provide only modest relief for firms with short duration liabilities and lessened interest rate sensitivity dampening. However, if the calibration of the cost of capital rate was to be set much lower than 6% and no floor on the cumulative taper, then the reduction would be more significant.

Glossary

Term	Definition
ALM	Asset and Liability Management. The practice of managing financial risks across liabilities and the assets that are held to back them.
Basis points	A unit of measure for interest rates and other percentages. One basis point is equal to one 100 th of 1% (i.e. 100 basis points makes up one percentage point). Also referred to in shorthand as “bps.”
Best estimate	Expectation of future experience such that there is an equal likelihood of the actual value being greater than or less than it.
BEL	Best Estimate Liabilities. Under Solvency II, the present value of future best estimate cashflows.
BPA	Bulk Purchase Annuity. An arrangement whereby defined benefit pension scheme liabilities are paid by an insurer or reinsurer, which includes buy-ins, buyouts and longevity swaps.
CEIOPS	Committee of European Insurance and Occupational Pensions Supervisors. The predecessor to EIOPA.
CDS	Credit Default Swap. An arrangement that allows an investor to swap or offset its credit risk with that of another.
CoC	Cost of Capital. The return required for a company to justify the capital outlay for a given capital project. Under Solvency II, this became the basis for calculating the value to be held in respect to the concept of the RM.
CoD	Cost of Downgrade. Losses incurred by a lender by reason of borrower ratings downgrade.
CQS	Credit Quality Steps more commonly known as ratings. A standardised indicator of credit risk that is recognised by the EU.
CRO Forum	Chief Risk Officers Forum established in 2004 to identify and benchmark good practice in risk management.
EC	European Commission. The executive arm of the EU, responsible for initiating new legislation and the day-to-day running of the EU.
ECAI	External Credit Assessment Institutions who provide external ratings. A standardised indicator of credit risk that is recognised by the EU.
EIOPA	European Insurance and Occupational Pensions Authority. The EU supervisory body for insurance established in January 2011.

Term	Definition
ERM	Equity Release Mortgages. A financial loan secured against residential property, and which includes Lifetime Mortgages and Home Reversions.
EVT	Effective Value Test. A test used by the PRA in determining whether firms are properly allowing for the risks associated with ERMs.
FCA	Financial Conduct Authority. The UK regulatory body responsible for the supervision of the conduct of financial services firms and financial markets.
FSMA 2000	Financial Services and Markets Act 2000. A UK legislative Act to make provision about the regulation of financial services and markets.
FS	Fundamental Spread. Under Solvency II, the credit related spread of the asset spread where the remainder is the MA that provides compensation for illiquidity risk
IAIS	International Association of Insurance Supervisors. A global regulatory standard setting body and a membership organisation of insurance supervisors from over 190 jurisdictions.
ICS	Insurance Capital Standard. A consolidated group-wide capital standard developed by the IAIS as part of the Common Framework for the Supervision of Internationally Active Insurance Groups.
Interquartile range	The range of a dataset expressed as the 75 th and 25 th percentiles of the data.
Internal model	A system for analysing an insurer's risk, to quantify risks and to determine the capital required to meet those risks. Under Solvency II, with the approval of its supervisor, an insurer may use its internal model to calculate its SCR.
MA	Matching Adjustment. Under Solvency II, a long-term guarantees measure designed to prevent spread volatility from introducing artificial balance sheet volatility and triggering procyclical investment behaviour.
MOCE	Margin Over Current Estimate. The percentile approach to the calculation of the RM as used in Scenario A of the QIS
Own funds	Under Solvency II, own funds consists of basic own funds and ancillary own funds, where basic own funds are composed of the excess of assets over liabilities and subordinated liabilities.
PD	Probability of Default. Probability of losses incurred by a lender by reason of borrower default.

Term	Definition
PRA	Prudential Regulation Authority. The UK regulatory body responsible for supervision of the prudential requirements of banks, building societies, credit unions, insurers and major investment firms.
QIS	Quantitative Impact Study.
QIS5	Fifth Quantitative Impact Study, conducted in 2011.
Renewables	Renewable energy sources, which includes solar, wind, hydro, biofuels and others.
RFR	Risk-free rate. The rate used for discounting liabilities under Solvency II, determined with reference to swap market rates where available. The term basis risk-free rate in Solvency II refers to the rate before any allowance for matching adjustment or volatility adjustment.
RM	Risk Margin. Under Solvency II, the amount to be added to BEL to align technical provisions with the amount another insurer would require to take on the business in an arm's length transaction.
Run-off value	A run-off value approach to capital requires sufficient capital to be held for the company's existing business to mature and close out in an orderly fashion under an extreme stress scenario.
SCR	Solvency Capital Requirement. Under Solvency II, the SCR is the amount of assets to be held in excess of liabilities to withstand a 1-in-200 loss event. The SCR is calculated using either the Standard Formula or an approved internal model.
Solvency I	Directive in EEC law concerning minimum capital requirements. The precursor to Solvency II
Solvency I Pillar 2	The UK's additional regulatory pillar under the Individual Capital Adequacy Standard concerning insurers' own assessment of solvency capital, introduced in 2004.
Solvency II	Directive in EU law setting out regulatory requirements for insurance firms and groups, covering financial resources, governance and accountability, risk assessment and management, supervision, reporting and public disclosure, which came into effect on 1 January 2016.
Standard formula	A risk-based formula used by insurers to calculate their SCR under Solvency II.
Tapered cost of capital	The cost of capital approach to the calculation of the RM which reduces the cost of capital at late durations as used in Scenario B of the QIS.
Technical provisions	Under Solvency II, the amount required to be paid to transfer the insurance business to another undertaking. The sum of BEL and RM.

Term	Definition
TPR	The Pensions Regulator. The UK regulator of work-based pension schemes.
Transfer value	A transfer value (or exit value) is the estimated price for an asset or transfer of a liability on the open market.
UFR	Ultimate Forward Rate. Under Solvency II, the rate which market data is extrapolated to derive the interest rate term-structure at long durations. The UFR is equal to the sum of the expected real rate and an estimation of the expected long-term inflation rate.
VaR	Value at Risk. A risk metric representing the maximum potential loss on a portfolio over a given future time period with a given degree of confidence.
VA	Volatility Adjustment. Under Solvency II, a long-term guarantees measure designed to dampen the impact of short-term spread movements.
Z-spread	Zero-volatility spread. The constant adjustment that makes the price of a security equal to the present value of its cashflows when added as a parallel shift to the risk-free yield curve used to discount the cashflows.

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