

Supervisory Statement | SS8/18

# Solvency II: Internal models - modelling of the matching adjustment

July 2018



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## 1 Introduction

1.1 This supervisory statement (SS) sets out the Prudential Regulation Authority's (PRA) expectations of firms regarding the application of the Solvency II matching adjustment (MA) within the calculation of the Solvency Capital Requirement (SCR).

1.2 The SS is addressed to UK Solvency II firms and to the Society of Lloyd's and its managing agents. It is most relevant to firms with or seeking MA approval and which use a full or partial internal model to determine the SCR, together with UK Solvency II firms making an assessment as to the appropriateness of the standard formula for their risk profile.

1.3 This statement should be read in conjunction with the following Parts of the PRA Rulebook:

- Technical Provisions (Chapters 6 and 7);
- Solvency Capital Requirement – General Provisions (Chapter 3);
- Solvency Capital Requirement – Internal Models (Chapters 10 to 16); and
- Investments (Chapter 2).

1.4 It should also be read in conjunction with the document 'The PRA's approach to insurance supervision'.<sup>1</sup>

1.5 The PRA has considered the relevant sections of the Solvency II Directive<sup>2</sup> and the Solvency II Delegated Regulation (Delegated Regulation)<sup>3</sup> when setting the expectations noted in this SS.

1.6 The European Insurance and Occupational Pensions Authority (EIOPA) publication entitled 'The underlying assumptions in the standard formula for the Solvency Capital Requirement calculation'<sup>4</sup> will also be relevant for firms using this SS in the context of an assessment of standard formula appropriateness.

1.7 The MA allows firms to adjust the relevant risk-free interest rate term structure for the purposes of calculating the best estimate of a portfolio of MA-eligible insurance or reinsurance obligations. In order to calculate the MA for a portfolio, firms must determine the fundamental spread (FS) to be used in the calculation. To apply an MA, firms must have PRA approval, as per Regulation 42 of The Solvency 2 Regulations 2015. Firms with MA approval are permitted to apply an MA for the purposes of determining both technical provisions (TPs) and the SCR. Firms should have confidence that the level of MA benefit assumed in each of these calculations is fit for purpose. This SS covers the application of an MA as part of the SCR calculation. In general, the references to stressed MA and stressed FS in this SS are intended to apply to the entire MA portfolio on the stressed balance sheet unless otherwise stated.

1.8 The PRA recognises that many firms hold a relatively wide range of assets in their MA portfolios. These assets will differ in terms of liquidity and complexity; many of them may not be traded assets. The PRA's expectations set out in this statement primarily apply to the risks

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1 March 2016: [www.bankofengland.co.uk/prudential-regulation/supervision](http://www.bankofengland.co.uk/prudential-regulation/supervision).

2 Directive 2009/138/EC.

3 Commission Delegated Regulation (EU) 2015/35.

4 25 July 2014.

arising in respect of corporate bond assets within firms' MA portfolios. However, many of the expectations apply irrespective of the assets held and the PRA would therefore expect firms to consider the expectations set out in the SS to be more widely applicable unless specifically stated otherwise. In a number of places (eg paragraphs 4.10, 4.15, 4.20, 4.22, 5.17 and 5.18) the SS sets out specific expectations in relation to less liquid assets. In future, the PRA may issue further, more bespoke, expectations for the SCR treatment of other assets within an MA portfolio, such as illiquid assets.

1.9 The chapters that follow set out the PRA's expectations in relation to the modelling of the MA within the SCR calculation. The PRA considers that meeting these expectations will be in line with its general approach to the supervision of firms.

- Chapter 2 of the SS clarifies the PRA's overarching expectations as to how the MA should be captured in the SCR and the extent to which firms' modelling approaches for the MA should be constrained by the approach used in the calculation of TPs.
- Chapter 3 then discusses a framework for the modelling of the MA within internal models.
- Chapters 4 to 6 expand on the steps within this framework.

## **2 Allowing for a matching adjustment within the SCR calculation**

2.1 The requirements for the calculation of the MA are set out in Technical Provisions 7.2(2), which states that 'the matching adjustment shall not include the fundamental spread reflecting the risks retained by the firm'.

2.2 For the purposes of determining TPs, the fundamental spread (FS) calibrations used in the MA calculation are provided by EIOPA in technical information produced in accordance with Technical Provisions 7.3 to 7.5. However, no similar technical information is provided in order to calculate the SCR.

2.3 A firm's SCR should capture all material and quantifiable risks<sup>1</sup> to which it is exposed. The calculation of the SCR should therefore allow for any changes to the FS and MA following a stress event. In doing this, firms should determine the risks to which the MA portfolio is exposed, how these risks could affect the FS and MA and assess how this impact is captured within the SCR calculation.

2.4 The PRA has identified at least three high-level reasons why the FS could change following a stress:

- (i) changes in investment portfolio quality due to the occurrence of a stress;
- (ii) assumption changes to reflect an updated forward-looking view of the FS following the stress; and
- (iii) assumed management actions, including rebalancing of the MA portfolio, that are required to maintain MA compliance following a stress. The extent of the actions required will be driven by the extent of any mismatch between the asset and liability cash flows following a stress event within the MA portfolio.

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<sup>1</sup> General Provisions 3.3(1) and Internal Models 11.6.

2.5 For the purposes of assessing how the assumptions underlying the FS calibration could change post-stress (2.4[ii] above), it is important that firms' internal models are not inappropriately constrained by the assumptions and parameters used to calculate TPs. The PRA would therefore not expect firms to adopt a purely 'mechanistic approach' to determine the FS following a stress that directly follows the assumptions and methodology used to determine the FS for the purpose of calculating TPs. The PRA considers that a 'mechanistic approach' based on the re-application of the approach used to calculate TPs is unlikely to result in an SCR that takes into account all quantifiable risks to which a firm is exposed, including the risk of losses that are not allowed for within the TP calculation.

2.6 Firms should ensure that their chosen method to determine the FS under stress takes account of all quantifiable risks to which they are exposed. Firms should particularly consider those risks that have been retained within their MA portfolio(s) and ensure that their modelling approach results in an SCR that covers those risks at the 99.5% confidence level.

### **3 A framework for determining the matching adjustment used in the SCR calculation**

3.1 The PRA has developed a five-step framework that sets out how the MA could be considered in the context of the SCR calculation. The steps in the framework are:

**Step 1:** re-value the MA portfolio assets under a one-year stress;

**Step 2:** calculate updated fundamental spread values, reflecting the stressed modelled economic environment;

**Step 3:** verify whether the MA qualifying conditions are still met (allowing also for any changes in liability cash flows/values);

**Step 4:** if step 3 has failed, then the cost of re-establishing an MA compliant position should be estimated; and

**Step 5:** re-calculate the MA. Note that based on the analysis in the previous steps this may need to be based on a re-balanced MA asset portfolio.

3.2 The PRA considers that this framework will help firms to exhibit and validate that their approach covers all material and quantifiable risks to which they are exposed. Therefore, it would be good practice for firms to reconcile their approach with the steps in the framework in their internal model documentation.

3.3 The chapters that follow contain the PRA's more detailed expectations as to how the MA should be reflected within the SCR calculation. These have been linked, where appropriate, to the relevant steps in the PRA's framework for ease of reference. However, the PRA considers that firms should be able to meet these expectations regardless of the modelling approach they have used.

## 4 Impact of a one-year stress on the matching adjustment

4.1 The SCR is defined as corresponding to ‘the Value-at-Risk of [the firm’s] basic own funds subject to a confidence level of 99.5% over a one-year period’.<sup>1</sup> The modelled change in basic own funds will capture any change in the MA.

4.2 When considering how a stress event can impact the MA, the PRA expects firms to capture any changes in the:

- value and cash-flow profile (before and after risk adjustment) of assets held in the MA portfolio as a result of the stress event; and
- cash-flow profile of the MA liabilities as a result of the stress event.

4.3 These changes can result from either actual portfolio losses due to the stress event or from changes in valuation assumptions triggered by new data or other information emerging over the one-year period. Furthermore, new risks may emerge in stress and existing risks could become more prevalent.

4.4 Steps 1 and 2 of the PRA’s five-step framework address the first of the points in paragraph 4.2 above. The second point is relevant to Steps 3, 4 and 5 and is discussed in Chapter 5.

### Asset side stress to MA portfolio assets

4.5 The PRA expects firms to determine the change in the MA asset portfolio value over one year. This is intended to capture only those assets that were already in the MA portfolio pre-stress and not any assets subsequently injected in order to rebalance the portfolio post-stress.

4.6 Any firm that does not explicitly model a change in the value of the assets is unlikely to be able to demonstrate that it can continue to meet the MA requirements in stress, and in particular to determine whether the value of assets in the MA portfolio covers the best estimate value of the MA liabilities.

4.7 The methodology used to calculate the asset values under stress should also determine the credit quality (eg credit rating) of a firm’s assets under the modelled stresses at a suitable level of granularity. This is a key input into the MA in stress calculation.

4.8 Many of the considerations in modelling asset-side credit risk are common to the modelling of the stressed FS. The remaining paragraphs in this chapter refer only to the FS. However, the PRA encourages firms to consider their wider applicability.

### Risks retained in stress

4.9 In determining the level of stressed MA, the PRA expects firms to take appropriate account of the risks they retain in stress including:

- downgrade and default risk (discussed below under ‘Modelling considerations in respect of downgrade and default risk’);
- basis risk; and

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<sup>1</sup> PRA Rulebook: SII Firms – Solvency Capital Requirement – General Provisions 3.4.

- concentration risk.

4.10 The PRA expects the range of risks is likely to be broader for assets other than corporate bonds such as direct lending, reflecting their more bespoke nature.

#### Basis risk

4.11 Possible sources of basis risk that the PRA expects firms to allow for in respect of their MA portfolios include:

- if firms make use of historical data to inform their calibrations or assumptions, the dataset(s) used may not be reflective of the actual holdings and/or risk profile of the MA portfolio. Even if historical data does perfectly reflect firms' holdings, the past may not be a good guide to the future and so an element of basis risk should be assumed to be present;<sup>1</sup>
- when firms choose to implement hedging strategies that are imperfect hedges; and
- if the risk profile of some of the firm's assets differs materially from the assumptions used by EIOPA to calibrate the FS for the purposes of calculating the TPs.

4.12 Where firms allow for basis risk when determining the stressed values of their asset holdings, they should consider how this affects the calculation of the FS in stress and whether basis risk has been appropriately reflected in the stressed FS.

#### Concentration risk

4.13 Concentration risk can arise from a firm being disproportionately exposed to, for example, a given issuer or sector. If concentration risk is not captured in the FS used in the calculation of TPs, for example if the FS calibration implicitly assumes the portfolio is well-diversified, then firms may be exposed to additional concentration risk.

4.14 In assessing the extent to which a firm is exposed to concentration risks in its MA portfolio, the PRA expects a firm to use a number of different approaches including potentially:

- analysing the composition of its current MA portfolio(s) and the associated investment mandates and policies to identify potential areas of concentration, for example, large single name exposures, sector exposures, or simply concentration arising from having relatively few different asset holdings comprising the total portfolio;
- including quantitative measurements where possible (eg using the Herfindahl index<sup>2</sup>); and
- conducting stress and/or scenario testing to assess to what degree concentration risk in the MA portfolio could crystallise in a severe credit event.

4.15 Concentration risk on non-corporate bond assets is likely to be more complex and could arise from a wider range of sources. Where a firm has material exposure to assets other than corporate bonds in its MA portfolio, then any analysis of concentration risk exposure should reflect the nature of these assets and the types of concentration risks to which they give rise.

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1 It may also be the case that calibrating statistics based on historical data does not fully capture the statistical qualities of the forward-looking distribution.

2 The Herfindahl index is a simple measure of concentration risk, defined as the sum of the squares of the 'market shares' of each asset, where the 'market share' is the ratio of an asset's value to the total asset value in the MA portfolio.



4.16 If a firm considers it does not have material exposure to concentration risk, it should be able to justify this conclusion through analysis of its own portfolio and should show how any potential concentration risks are mitigated (eg through exposure limits in the investment mandates).

4.17 If through the firm's analysis it considers its exposure to concentration risk to be material, it should make an allowance in the model calibration for the additional variability in losses that might be incurred in an economic stress. If this allowance is based on an approximation, the firm should be able to show that this approximation is reasonable given the risk exposure it is intended to capture.

#### **General modelling considerations when determining the FS calibration post stress**

4.18 The PRA does not have a preference or expectation as to the methodological approach used by firms to model the stressed FS, as long as the chosen approach meets the required tests and standards.

4.19 The PRA expects firms to justify the granularity of the underlying modelling performed to determine the stressed FS (eg by asset class, credit quality step (CQS), sector, term).

4.20 As a starting point the PRA expects firms to consider modelling the FS at the same level of granularity as in the calibration provided by EIOPA for the purposes of calculating TPs. However, a different level of granularity can also be justified. This is likely to be particularly pertinent where the firm's MA portfolio includes a material proportion of assets other than corporate bonds.

4.21 Firms should strike a balance between modelling to a level of granularity that reflects a firm's risk profile and ensuring sufficient credible evidence, supported by expert judgement, to develop calibrations reliably at this level of granularity.

4.22 In the case of firms that have material exposure to less liquid assets (eg illiquid, direct investments) within the MA portfolio, the PRA expects a separate approach to be developed to model the FS for these assets. While an approach similar to that used for corporate bonds may be possible, the level of adaptation from the core corporate bond methodology and calibration should depend on the similarity of the assets in question to corporate bonds. In some cases a more bespoke methodology may be necessary. Where firms do not distinguish between asset classes in their modelling, then the appropriateness of the model for each asset class should be clearly justified.

4.23 The PRA is open to firms applying proportionate modelling approaches (likely to contain limitations and approximations) where they have only small exposures to certain asset classes, but the PRA does not expect firms to make material investment decisions using a model that does not appropriately reflect the risk profile of such investments.

4.24 Firms may seek to use their models to determine the change in FS in stress or the total FS in stress. While the PRA does not have a preference for either metric, firms are expected to acknowledge, when determining their preferred approach, that these metrics imply two markedly different modelling philosophies that will have a direct impact on the extent to which the SCR behaves in a cyclical manner. The PRA expects firms to understand and justify the approach they have chosen and its limitations. Where a firm has identified scenarios where the approach operates in a way it considers inappropriate (eg produces counter-intuitive results relative to the change in risk profile), the firm should identify the actions it could potentially take in response, for example introducing an overlay using expert judgement.

4.25 When firms use historical data they should consider whether the data is:

- of sufficient length and quality to contribute towards a credible calibration for the risk in question;
- likely to contain a sufficiently extreme event or events to be useful for calibration purposes; and
- useful in determining how potential future credit events may manifest themselves.

4.26 In particular, firms should analyse whether actual migration and default rates over the future holding period of their assets could be more onerous than those observed in historical stress events, and make adjustments accordingly. The PRA also expects firms to set out clearly any judgements made around potential future crisis events that may differ in nature, magnitude and duration to crises seen previously.

### **Modelling considerations when determining an updated forward-looking view of the FS post stress**

4.27 Firms may model stressed FS tables by modifying the approach and inputs used to produce the FS tables for determining the TPs. The following paragraphs are of particular relevance for firms using this approach.

4.28 Article 77c of the Solvency II Directive and Article 54 of the Delegated Regulation set out the calculation method for the MA, the assumptions which underpin the MA and the approach which EIOPA should use to derive the technical information used to calculate the MA in accordance with Technical Provisions 7. While the PRA considers that the MA calculation method should not change in stress, the MA assumptions in the Solvency II Directive and Delegated Regulation are specifically set out in the context of the TPs calculation and firms should therefore consider whether they remain appropriate in stress.

4.29 Firms should ensure that the MA on sub-investment grade assets remains appropriate. Unless there are strongly justified arguments for moving away from the requirement in Technical Provisions 7.2(3) that (for the purposes of determining TPs) the MA on sub-investment grade assets does not exceed that on assets of investment grade credit quality of the same duration and asset class, then the PRA expects firms to continue to apply this restriction in stress conditions.

4.30 The PRA expects firms to maintain a floor (ie a minimum level of FS) based on long-term average spreads as part of their modelling of the stressed FS. As a minimum, the PRA expects firms to reapply the methodology and calibration of the floor as set out in Article 77c of the Solvency II Directive. If any changes are made to the floor, the PRA expects these changes to be justified. They should not result in a calibration below that which would have been obtained by re-applying the methodology and calibration used to calculate the TPs.

4.31 For all approaches, firms may also wish to apply other limits to the stressed FS. Often these will be grounded in historical experience or expressed as a percentage of total spread widening. While such limits can be helpful, they should not be an essential feature of firms' models or overshadow the importance of any more detailed modelling work undertaken.

4.32 Notwithstanding the above points, the PRA expects the methods used to determine the stressed FS calibrations to be grounded in the requirement that the stressed FS reflects the risks retained by the firm in stress. However, within their internal models, firms may need to

develop approaches that use different models and/or assumptions to those used to calibrate the FS for the purposes of determining the TPs calculation, in order for the SCR to take account of all quantifiable risks to which the firm is exposed. Firms are nonetheless expected to ensure that they use the EIOPA calibration to determine the FS for purposes of calculating TPs.

4.33 Specifically for corporate bonds, firms are expected to ensure that if they are using an approach to model the stressed FS that cannot closely replicate the FS used to calculate the TPs (in basis points or £ millions), consideration should be given to:

- how the FS or MA used to determine the TPs would compare to a proxy calculation based on the firm's own assumptions and what the key reasons are for any difference; and
- how the firm has chosen to express the stressed FS (ie as the total FS or as the change in FS) and whether the difference between its assumptions at the 50<sup>th</sup> percentile compared to the EIOPA assumptions could give rise to the SCR being potentially under- or over-stated.

### **Modelling considerations in respect of downgrade and default risk**

4.34 The matrix format of historical transition data potentially makes it difficult to model and/or compare transition data over time. When using transition data, the PRA expects firms to:

- consider different approaches to comparing transition matrices and assessing their relative strength. The PRA's preferred approach is for firms to consider the whole matrix rather than just a single cell or small selection of cells. However, a firm could also use an approach that considers only a selection of cells provided it has a procedure to translate the output of this alternative approach into a whole matrix;
- compare their modelled 1 in 200 transition matrix and matrices at other extreme percentiles against key historical transition events, notably the 1930s Great Depression (and 1932 and 1933 experience in particular). This should include considering how the matrices themselves compare as well as relevant outputs; and
- justify any shortfall between their 1 in 200 transitions scenario and the actual transitions experience implied by these events (and the impact of this on the level of capital held). Firms should explain how they have validated that the level of stress they are applying is capturing all quantifiable risks to which they are exposed in this context.

4.35 In relation to transitions data for corporate bond assets, withdrawn ratings are a specific feature of the data that should be allowed for. A rating is withdrawn where an entity or financial instrument is no longer rated by the ratings agency concerned. Reasons for withdrawals of rating can be varied and are not necessarily indicative of impending downgrade or default. Firms should be able to justify the reasonableness of the approach used to allocate withdrawn ratings across the transition matrix as well as provide sensitivity analysis that quantifies the impact of using different allocations.

4.36 In order to ensure that the stressed FS calibration fully captures the risks retained on a forward-looking basis, firms should consider whether their chosen methodology would allow the stressed experience (for one or more of the metrics modelled) to revert to more normal levels over a given period rather than instantaneously. This can be achieved through an explicit incorporation of a reversionary period (a 'glide path') within the model but other approaches are also possible.

4.37 In calibrating a glide path, the PRA expects consideration to be given to historical data and events as well as the theoretical justification.

4.38 Where a glide path is being modelled in respect of more than one element of the model (eg transitions and spreads) then the length and severity of the stressed period for different elements would not automatically be considered independent. The relationship between different glide paths should therefore be considered and any inconsistency should be justified.

4.39 Allowing stressed experience to revert to 'normal' over an extended period should not be seen as a correction for limitations elsewhere in the model.

## **5 Maintaining compliance with the MA requirements in stress conditions**

5.1 In order to take credit for an MA benefit in stress, firms need to check that their MA portfolio continues to meet the MA requirements<sup>1</sup>.

5.2 In particular the PRA expects firms to evidence that the MA portfolio continues to be adequately matched and that the asset eligibility criteria continue to be met.

5.3 When undertaking this assessment, firms should ensure that they have allowed for the impact of a stress event on both the assets and liabilities within the MA portfolio. For example, a longevity stress could result in an increase in the liability value, and an increase in longer-dated liability cash flows. Firms should also ensure that the assumptions used in this assessment are consistent with those used to stress the assets and liabilities in the MA portfolio in the given stress scenario.

5.4 Following a stress event, firms may conclude that the result of the assessment referred to above is that the MA qualifying conditions and/or any internal policies relating to the management of the MA portfolio would no longer be met. Steps 3 and 4 of the five-step framework cover checking and maintaining continued compliance with the MA qualifying criteria. The remainder of this chapter sets out the PRA's expectations regarding any potential actions that could be assumed to restore compliance with the MA qualifying conditions and internal policies. The PRA expects firms' assumed actions to be limited to those necessary to restore compliance. They should not include, for example, steps to optimise an already compliant portfolio in a stressed environment.

### **Re-establishing MA compliance post stress via rebalancing**

5.5 An assumption that a firm can rebalance an MA portfolio post stress within the SCR calculation constitutes a future management action within the internal model. Firms are therefore expected to show how their proposed approach to rebalancing meets the requirements set out in Article 236 of the Delegated Regulation. In particular, firms should clearly set out how the impact of rebalancing is allowed for within the calculation of the SCR.

5.6 In determining the conditions in which MA portfolios require rebalancing, firms should consider all risks that could affect the cash flow profile of the MA portfolio and ensure that the full cost and impact of any rebalancing is captured in the SCR.

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1 Technical Provisions 6.

5.7 Where a firm has reinsured all or part of the business in its MA portfolio, it should consider the extent of any rebalancing that may be required in the event of reinsurer default, and the reasonableness and achievability of this.

5.8 Firms should be able to demonstrate how the actions they propose to take to re-establish matching reflect: (i) the source of the stress (eg credit default or migration, longevity); (ii) the nature of the stress; and (iii) the severity of the stress. Firms should demonstrate that their proposed actions are realistic in the given stress event and show how they have taken account of how the type of stress could affect their ability to take such actions. Different management actions will likely be required in different scenarios, ie the same management actions need not be appropriate across the probability distribution forecast.

5.9 Following a stress, the PRA expects firms to:

- re-establish cash flow matching in Component A of the MA portfolio<sup>1</sup> as measured using the tests the firm has implemented to assess the adequacy of matching in its MA portfolio. The PRA would also expect firms to have regard to the level of matching measured using appropriate thresholds (eg using the published indicative thresholds for the PRA's 3 tests);<sup>2</sup> and
- consider whether additional assets are needed in Component B<sup>3</sup> to ensure that the value of assets equals the value of best estimate liabilities within the MA portfolio and determine any costs of re-establishing MA compliance.

5.10 Any rebalancing action should be consistent with the firm's wider risk management framework and the Prudent Person Principle (PPP).<sup>4</sup> In particular, firms should consider whether their investment policies (as drafted) may prevent proposed rebalancing actions from being completed in practice.

5.11 Rebalancing actions assumed in SCR calculations should take account of any such restrictions and should either operate within the current policies (as drafted) or should clearly set out changes required to the policies together with justification as to why they are achievable. In the latter case, such justification should include discussion of the governance that would be enacted to make potential changes to the investment policies if necessary and the timescales that would be needed to do this. Any planned changes to investment policies would need to be compatible with the firm's wider risk management framework and the PPP. On rebalancing, the PRA considers one or both of the following options to be viable provided the option is demonstrably feasible in the stress scenario in question:

- demonstrating that the required eligible assets are held outside the MA portfolio and can be injected post-stress; and/or
- assuming the required assets have to be purchased from the market and demonstrating that sufficient funds will be available to achieve this.

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1 Component A of the MA portfolio refers to the assets whose cash-flows replicate the expected liability cash-flows after being adjusted for the component of the fundamental spread that corresponds to the probability of default.

2 PRA Supervisory Statement 7/18 'Solvency II: Matching adjustment', July 2018: [www.bankofengland.co.uk/prudential-regulation/publication/2018/solvency-2-matching-adjustment-ss](http://www.bankofengland.co.uk/prudential-regulation/publication/2018/solvency-2-matching-adjustment-ss).

3 Component B of the MA portfolio refers to the additional assets that, when added to component A, result in the value of the assigned portfolio (ie components A and B combined) being equal to the best estimate of the liabilities within the MA portfolio.

4 Investments 2.

5.12 Firms should consider the impact of the stress event on the value of any assets to be injected into the MA portfolio, and any assets that are to be sold for the purposes of purchasing eligible assets.

5.13 In a situation where the MA portfolio has become mismatched, or is no longer complying with the MA requirements, firms have a two-month window in which to take actions to restore compliance with the requirements<sup>1</sup>. Firms should consider how this two-month window impacts their investment and rebalancing strategies.

5.14 The requirement to remedy a breach within two-months does not necessarily preclude firms from modelling further rebalancing actions, beyond those required to restore MA compliance that may be taken within the SCR timeframe in accordance with firms' own investment strategies and risk limits. Firms will, however, need to demonstrate how any such actions comply with the relevant Solvency II requirements. Firms will need to demonstrate that such rebalancing actions are feasible given limited and uncertain timeframes and the potential scarcity of suitable assets and/or competition from other investors. The PRA expects firms to ensure that the calibration and ranking of the '1 in 200' stress considers both the quantum of the stress and the window for any rebalancing actions beyond that needed to restore compliance within two months. The PRA considers that these factors are likely to set a high bar to firms being able to justify a material benefit from any such actions.

### **Injection of eligible assets from elsewhere in the business**

5.15 Where a firm assumes that any rebalancing can be done by injecting eligible assets from outside the MA portfolio, the PRA expects the firm to be able to demonstrate that:

- assets held outside the MA portfolio meet the MA eligibility criteria and have the same features as those already in the MA portfolio;
- the appropriate amounts of eligible assets are available outside the MA portfolio;
- the eligible assets outside the MA portfolio are of the appropriate duration and CQS (in order to meet the cash-flow matching requirements);
- the assets outside the MA portfolio are not encumbered or required for other purposes (eg to meet margin calls on derivatives held outside the MA portfolio);
- it has performed a detailed assessment of investment concentration and correlation to ensure that there is not a risk of it assuming it has assets available to inject into the MA portfolio to replace any defaulted assets when in reality the degree of common exposures means that a number of the assets outside the MA portfolio would also have defaulted; and
- it has considered the degree to which its MA portfolio may hold concentrated exposures following actions taken to rebalance the portfolio post stress and has reflected this in the SCR.

### **Asset purchases: availability considerations**

5.16 Where a firm assumes that rebalancing involves purchasing of new assets, the PRA expects the following points to be considered and appropriately allowed for in the SCR:

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<sup>1</sup> Technical Provisions 6.4.

- the availability and liquidity of the assets being sought;
- the likely level of competition for the assets in question. After a systemic market event, it is feasible that there could be a flight to quality in the market and firms should allow for this and the impact it could have on price;
- potential new or increased risks that the assets sought could introduce to the MA portfolio (eg increased concentration of exposures); and
- whether the firm can reasonably expect to do the trading needed in the two-month timeframe available to restore compliance with the MA requirements.

5.17 The PRA expects firms to give careful consideration to the types of assets that could be purchased in stressed conditions, in particular whether less liquid assets could be purchased. In the PRA's view, completing such transactions is likely to be particularly difficult in stress conditions and within the required timescales.

### **Asset purchases: funding considerations**

5.18 Where a firm assumes that rebalancing to remedy a breach within the required two-month window involves purchasing of new assets, the PRA also expects the following points to be taken into account as to how the purchases will be funded:

- where a firm assumes it can use assets outside the MA portfolio to fund such purchases, the liquidity of these assets should be assessed in order to determine the feasibility of undertaking this action in practice;
- the PRA would not usually expect firms to assume the replacement assets are purchased using the proceeds from defaulted assets or the sale of assets downgraded below investment grade. This is due to the difficulty in objectively determining prices or recovery rates in a stressed environment and the likely delay in receiving such recoveries (ie there is considerable doubt as to whether the recoveries could be obtained within the two-month timeframe to restore MA compliance);<sup>1</sup>
- the PRA would be unlikely to consider it realistic for purchases to be funded by an assumed sale of less liquid assets; and
- the PRA would expect demonstration of the ability of the firm to sell the assets in question regardless of whether these assets sit in the MA portfolio (ie that they are not otherwise required or encumbered).

5.19 An allowance should be made for expected transaction costs, incurred through any trading activity, in a stressed environment. This allowance should take account of the likelihood that such costs will be higher in stress than in normal conditions. This is particularly pertinent where large trading volumes are envisaged – the PRA expects firms to hold capital to allow for transaction costs.

5.20 The PRA also expects firms to undertake sensitivity tests to reflect the risk that it is not possible to purchase the assets intended to be purchased post stress. In particular the PRA considers that it is a useful comparator for firms to show the impact on the stressed MA and

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<sup>1</sup> Technical Provisions 6.4.

the SCR if only gilts were available in order to indicate the extent to which reliance is being placed on obtaining assets that attract a higher MA benefit.

### **Assessment of whether MA compliance has been re-established**

5.21 Firms should clearly demonstrate that sufficient MA-eligible assets are held to cover the MA liabilities in conditions as at the valuation date, and are readily available (or may be obtained) to cover the MA liabilities in stress. One possible method to demonstrate this is a 'matching rectangle'<sup>1</sup> assessment. If a firm chooses this approach (or similar approaches that achieve the same outcome), the assessment should be completed in both current and a suitable number of stress scenarios across the probability distribution forecast. Any such assessment should consider the balance sheet gross of the transitional measure on technical provisions (TMTP).

## **6 Validation of the amount of MA assumed in the SCR calculation**

6.1 As per Step 5 of the PRA five-step framework, firms are expected to perform a recalculation of the MA in stressed conditions. This calculation should apply the same calculation method as that used to determine the MA for the purposes of calculating the TPs; including ensuring that the level of cash-flow matching is in line with the firm's matching tolerances.

6.2 Firms are also expected to validate the MA benefit assumed in the SCR calculation and the assumptions on which this MA benefit is based. There are a range of methodological approaches that firms could use to do this.

6.3 When validating the amount of MA assumed in the SCR calculation, the PRA expects firms to explicitly and separately cover:

- the assumed impact of the stress event on the level of MA benefit, and;
- the impact of any management actions taken to restore MA compliance, including the impact of these actions on the MA benefit.

6.4 For the purpose of ensuring the MA is appropriately reflected in firms' internal models, the PRA expects firms to set out an approach that allows for the full range of risks and risk interactions to which the MA portfolio is exposed. Specifically for the MA portfolio, the PRA expects a firm to consider explicitly the impact of underwriting risk stresses the MA portfolio could suffer (eg a longevity stress and the associated requirement to find additional long-dated cash flows to match the additional long-dated liability cash flows arising after an adverse change in longevity assumptions).

6.5 Where a firm does not have an internal model covering all risks to which the MA portfolio is exposed, the PRA expects these risks and associated risk interactions to be considered in the own risk and solvency assessment (ORSA). Over time, firms should aim to incorporate all material risks and risk interactions to which the MA portfolio is exposed in their full or partial internal model, with consideration given as to any temporary measures that may be required.

6.6 Modelling management actions (to restore MA compliance) within the internal model is complex, especially for firms that determine their SCR using stochastic methods. Such actions

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<sup>1</sup> An actuarial technique for summarising which assets are apportioned to which liabilities.



can also change the ranking of scenarios and therefore the ultimate SCR. Firms should consider the effect of the management actions in a suitable number of scenarios across the probability distribution forecast to ensure an appropriate scenario ranking is achieved.

6.7 If a firm is using a variance-covariance approach to determine the SCR, the PRA expects the firm to consider whether any further adjustments are required to restore MA compliance in the SCR scenario. This can potentially be incorporated as an end-piece adjustment (eg via a non-linearity adjustment).

6.8 The PRA expects firms to validate the level of MA benefit assumed in the SCR calculation using a methodology that differs from the primary methodology used to calibrate the stressed MA. In particular, where a calibration method is highly reliant on expert judgement, the validation approach should aim to make use of historical data (if possible) to demonstrate the appropriateness of the output, and vice-versa. For the avoidance of doubt, the PRA does not expect firms to run two parallel models for the MA but the validation approaches used should be sufficiently independent from the core modelling methodology so as to give adequate comfort as to the appropriateness of the overall stressed MA and its underlying drivers.

6.9 Where firms' models to determine the stressed FS are modifications of the approach used by EIOPA to determine the FS for the purposes of calculating the TPs, the PRA expects the models to be capable of replicating the FS provided by EIOPA in the same economic conditions. This should act as a check on whether the model is fit for purpose.

6.10 While the PRA recognises the importance of industry benchmarking surveys as a validation tool, care needs to be taken to ensure that comparable metrics are being assessed and that the surveys used take adequate account of potential differences between firms including the:

- approach to rebalancing; and
- concentrations of exposure.

6.11 Also, while simple metrics such as the MA in stress as a percentage of the spread widening have an intuitive appeal, the MA is a portfolio-level calculation and care needs to be taken to ensure that this is appropriately reflected in any conclusions based on benchmarking studies. Firms should not place material reliance on such an assessment for the purposes of validating the modelled matching adjustment in stress unless it is sure that the comparison is on a truly like-for-like basis.