

Supervisory Statement | SS5/14

# Solvency II: calculation of technical provisions and the use of internal models for general insurers

April 2014



BANK OF ENGLAND  
PRUDENTIAL REGULATION  
AUTHORITY



31 December 2024: This document has been superseded. Please visit

<https://www.bankofengland.co.uk/prudential-regulation/publication/2014/solvency-2-calculation-of-technical-provisions-and-the-use-of-internal-models-for-general-ss>

Superseded

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## 1 Introduction

1.1 While the Solvency II (SII) Directive will not come into force until 1 January 2016, the Prudential Regulation Authority (PRA) publishes this statement in April 2014 to enable firms to consider the PRA's expectations as part of their planning and preparation for the new regime. The PRA expects to receive legal powers to receive, review and make determinations on applications at transposition on 31 March 2015. The PRA acknowledges that further directly applicable regulations or guidelines from the European Insurance and Occupational Pensions Authority (EIOPA) may, in due course, be issued in relation to the areas covered in this statement, and draws firms' attention to the fact that this statement may be subject to review, and may be withdrawn on or before 31 December 2015.

1.2 This statement expands on the PRA's general approach as set out in its insurance approach document.<sup>(1)</sup> As part of the PRA's preparations for the SII regime, this statement seeks to ensure that general insurers set an adequate level of technical provisions and hold sufficient capital. By clearly and consistently explaining its expectations of firms in relation to the particular areas addressed, the PRA seeks to advance its statutory objectives of ensuring the safety and soundness of the firms it regulates, and contributing to securing an appropriate degree of protection for policyholders. The PRA has considered matters to which it is required to have regard, and it considers that this statement is compatible with the Regulatory Principles.<sup>(2)</sup>

1.3 In light of the introduction of a statutory secondary competition objective<sup>(3)</sup> for the PRA, it has also considered whether the content of this statement facilitates effective competition in markets for services provided by PRA-authorized persons in carrying on regulated activities. This statement is designed to assist firms to prepare for the implementation of harmonised prudential capital standards under SII. The PRA intends to apply the SII requirements proportionately. The PRA therefore considers the content of this statement to be compatible with the facilitation of effective competition.

### Feedback to responses

1.4 The PRA consulted on the content of this statement in CP7/14. The PRA received seven responses to the consultation paper.

1.5 Some responses suggested alternative wording to make the statement clearer. Where the PRA considered that the clarity would be improved, these suggestions have been accepted.

1.6 Some responses asked for further information on specific points. Where firms have such queries, these should be taken up with individual firm supervisors.

1.7 Some respondents considered that the expectations set out in the statement were overly burdensome in certain areas. The PRA notes these responses, highlights that the expectations set out were derived directly from the SII requirements and reiterates its intention to apply the requirements in a proportionate manner. This statement sets out the outcomes expected, but does not prescribe any particular way to meet these expectations.

## 2 Technical provisions

### Realistic assumptions and adequate methods

2.1 Article 77(2) of the Directive requires technical provisions to be calculated using 'realistic assumptions and adequate methods'. Article 77(3) and the expected associated provisions in the Delegated Acts extend this requirement to the calculation of the risk margin.

### Risk margin

2.2 The PRA considers the risk margin to be a significant part of the technical provisions calculation, so it is important that firms consider whether the methods used there are in fact adequate. This should include consideration of the underlying assumptions.

2.3 For example, firms should not approximate the future Solvency Capital Requirements used to calculate the risk margin as proportional to the projected best estimate unless this has been shown not to lead to a material misstatement of technical provisions.

### Events not in data

2.4 Many firms use reserving methods that project forwards from historical data. On its own, this is unlikely to satisfy the Directive requirement for a probability-weighted average of future cash-flows, since not all possible future cash-flows — or the events that cause them — may be represented in the data.

2.5 Although these events are sometimes referred to as 'binary events' or 'extreme events', such terms suggest that events not found in the data are necessarily extreme or rare. This is not the case, so the PRA prefers to use the term 'events not in data', or ENID.

(1) [www.bankofengland.co.uk/publications/Documents/praapproach/insuranceappr1304.pdf](http://www.bankofengland.co.uk/publications/Documents/praapproach/insuranceappr1304.pdf).

(2) Section 3B of the Financial Services and Markets Act 2000 (FSMA).

(3) [www.bankofengland.co.uk/pr/Pages/default.aspx](http://www.bankofengland.co.uk/pr/Pages/default.aspx).

2.6 Firms should take ENID into account when calculating technical provisions. Applying a simple percentage uplift without justification is not an adequate method.

2.7 Where outliers are removed from the data as part of the reserving process, this removes events from the data. Firms should make an allowance for this in the technical provisions calculation unless they have shown that it would not be possible for these, or similar, events to occur again in future.

### Premium provisions

2.8 Many firms use business plan loss ratios to set the level of premium provisions. Using optimistic business plan loss ratios for this purpose is not realistic, and will not produce a best estimate as required by Article 77 of the Directive.

### Approximations

2.9 A number of firms have approximated an aspect of the technical provisions calculation on grounds of materiality. Where this is the case, firms should quantify the materiality. Where firms make a number of such approximations, their cumulative materiality should also be considered; it is not adequate simply to demonstrate that each aspect taken alone is immaterial.

2.10 For example, where firms have assumed that the impact of lapses on technical provisions is not material, they should quantify the materiality, and consider this together with the impact of other simplifying assumptions made.

## 3 Internal models

### Material risks

3.1 Article 121(4) of the Directive requires that internal models cover 'all material risks' to which firms are exposed.

### Events not in data

3.2 The concept of ENID also applies to the data used to set the parameters for the internal model. Firms should not assume that parameterising the internal model using only historical data will take into account all quantifiable risks, unless an unadjusted distribution has been shown to capture the full range of possible future events, for example by way of stress and scenario testing.

3.3 For example, for liability lines, data sets covering recent years may not include sufficient examples of liability catastrophes, which can significantly increase the dependency between policies, and, as a result, the volatility. Parameterising the internal model using such a data set alone would omit the possibility of future liability catastrophes, failing to cover all material risks.

### Risks covered by third party models

3.4 Where firms use third party models, firms should take particular care to demonstrate that the model covers all

material risks in their own risk profile. This is consistent with the expected requirement in the Delegated Acts to monitor limitations arising from the use of external models. For example, where firms have used a third party model for earthquake exposure, they should ensure that the internal model also covers related risks, such as corresponding tsunami exposure.

### Consistency with technical provisions

3.5 Article 121(2) requires the methods used in the internal model to be 'consistent with the methods used to calculate technical provisions'.

### Technical provisions in the internal model

3.6 In order to calculate the movement in basic own funds over one year, it is necessary to calculate technical provisions in the internal model. When selecting a method for this purpose, firms should ensure that the method produces similar results to a full technical provisions calculation throughout the probability distribution forecast, and not just in benign circumstances.

3.7 For example, firms should not use an automated re-reserving ('actuary-in-the-box') method with a basic chain ladder where this would fail to capture the significant judgement — such as a change in reserving basis — that reserving practitioners would apply following a severe deterioration in claims incurred or the emergence of new information such as a legal judgement.

### Assumptions and techniques

3.8 Article 121(2) requires firms to base the internal model on 'adequate, applicable and relevant techniques' and 'realistic assumptions', and to 'justify the assumptions underlying the model' to the PRA.

### Uncertainty around parameters

3.9 Firms should allow for estimation error where this is material and it is practicable to do so, in line with the expected Delegated Acts.

3.10 For example, where there is significant uncertainty around a sensitive parameter, so that the correct value could lie anywhere in a range, firms should seek to reflect the parameter uncertainty in their choice of parameter value unless they have otherwise quantified and allowed for this estimation error in the model.

### Calendar year effects

3.11 Calendar year effects, such as claims inflation, can have a significant impact on the volatility of future reserve development. Firms should only use methods that do not capture calendar year effects explicitly if they have shown that the resulting distribution appropriately reflects the volatility



introduced by these effects, or if such volatility is captured elsewhere in the model.

### Improvements in performance

3.12 Firms should not assume an improvement in performance relative to that seen in the past unless such an improvement has been clearly justified, in line with the expected Delegated Acts. For example, it would not be realistic to base the internal model on a business plan which assumes improved underwriting results unless the measures taken have been shown to be effective.

### One-year emergence of risk

3.13 Firms should not assume that insurance risk emerges simply according to a historical paid or incurred development pattern. Where firms use an emergence factor method (where one-year risk is assumed to be a proportion of ultimate risk), firms should not base the emergence factor purely on the incurred or paid pattern.

3.14 Where historical paid or incurred patterns are used in the model, firms should not assume that these will be repeated in future, unless the firm has shown that this is a realistic assumption throughout the probability distribution forecast.

### Industry standards

3.15 While, in line with expected requirements in the Delegated Acts, firms should ensure that the internal model reflects progress in generally accepted market practice, assumptions cannot be justified solely on the grounds that they are 'industry standard' or 'established good practice'. Firms should justify assumptions on the basis of their own specific risk profile.

### Default options

3.16 When justifying the assumptions underlying an external model, it is not sufficient to justify the assumptions on the grounds that they are selected by default. Firms should justify all assumptions on the basis of their own specific risk profile.

3.17 For example, where a catastrophe model is set by default not to allow for clustering of storms, firms should demonstrate that this assumption is appropriate for their risk profile, and cannot justify this assumption on the grounds that it is selected by default.

### Data

3.18 Article 121(3) requires that 'data used for the internal model' to be accurate, complete and appropriate.

### Data used

3.19 Any data that can have an impact on the outputs of the internal model should be considered to be 'used for the internal model', and must therefore be accurate, complete and appropriate. For example, where a firm has material natural

catastrophe risk, the exposure data input into the catastrophe model should be accurate, complete and appropriate.

### Risk mitigation

3.20 Article 121(6) allows firms to take into account risk-mitigation techniques in the internal model, as long as the risks arising from the techniques are 'properly reflected'.

### Reinsurance exhaustion

3.21 The most common risk mitigation technique is the modelling of purchased reinsurance. Where firms model reinsurance, they should allow for the possibility of reinsurance exhaustion in order to ensure that the risks arising from the risk mitigation techniques are properly reflected.

### Management actions

3.22 Article 121(8) allows firms to take into account 'management actions that they would reasonably expect to carry out in specific circumstances'.

### Renewal of reinsurance

3.23 Firms should treat the renewal of reinsurance in the model as a future management action unless it has been shown that the renewal will not rely on a decision made by the firm.

### Validation standards

3.24 Article 124(1) requires firms to have a regular cycle of validation to 'review the ongoing appropriateness' of the internal model.

### Specific validation

3.25 In order to review the ongoing appropriateness of the internal model, firms should perform validation that relates specifically to their own risk profile. For example, it is not satisfactory to review the appropriateness of a third party model purely on the basis of generic validation performed by the model vendor.

### External models and data

3.26 Article 126 of the Directive requires firms to apply Articles 120 to 125 to external models and data.

### Data from third party models

3.27 Firms often use data output from a third party model. Where the assumptions and methods the third party uses to produce the data could have a material impact on the outputs of the firm's internal model, firms should demonstrate that the external model itself satisfies Articles 120 to 125, and not the data alone.

3.28 For example, where firms are provided with catastrophe risk event loss tables by a third party, Articles 120 to 125 should be applied to the model that produced the tables, and not to the tables alone.