

PEARL GROUP

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20 February 2009

Louise Pryor
Board for Actuarial Standards
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Dear Ms Pryor

Consultation Paper: Modelling

Pearl supports the introduction of a Technical Actuarial Standard (TAS) on modelling and recognises that the proposals complement the move to a Solvency II framework. We support the majority of the principles outlined in the paper, particularly for developments on large, complex models and our responses are provided with these models in mind.

Our main concern is the impact that an immediate introduction of the TAS would have on a company like Pearl that has a large number of models, a significant proportion of which have been inherited from acquisitions. To meet the documentation requirements recommended in the TAS over a short transitional period would require a significant amount of work and would be at a cost to other projects designed to improve the overall control environment. We would therefore recommend an appropriate transitional period.

Our responses to the detailed questions summarised in Section 8 of the TAS are included as an appendix. Please let me know if you would like to discuss our comments in more detail.

Yours sincerely

Nick Watkins
Actuarial Production Manager
Pearl Group

Appendix: Response to Consultation Paper Questions

Pearl believes that the paper ignores a crucial intermediate party; “providers of actuarial information”, defined here as those people responsible for producing the specific realisations of the model and preparing and presenting the actuarial information to the users who will then base critical decisions on the information provided. In many cases those who produce the actuarial information for the user are not model developers. In a typical life office; the model developers would be the systems team; the providers of actuarial information are the reporting teams and lastly the users of actuarial information are the Board and/or senior management.

Responses to Questions 1-22 from Section 8 of the Modelling TAS

1. Will purpose of modelling TAS help to ensure that users of actuarial information can place a high degree of reliance on its relevance, transparency or assumptions, completeness and comprehensibility?

We are happy with the purpose of the modelling TAS and agree that if the four principles are covered, then users of actuarial information that is based on model output will be confident that they can rely on that information to help make decisions.

2. Will the definition of a model (2.13) encompass the full range of models that contribute to actuarial information?

The definition is wide enough to consider all models but maybe too wide as any spreadsheet with simple sums in them could theoretically be included. This may cause onerous documentation requirements given the principles contained later in the paper

3. Do respondents have any comments on the proposals in 3.15, 3.22, 3.27?

Paragraph 3.15

Pearl agrees that documentation should “state its purpose and its intended readership and be complete for that purpose and clear and unambiguous for that readership”.

Model documentation should seek to address the knowledge gap that exists between model developers and providers of actuarial information. Well targeted documentation of sufficient detail should exist to cover input parameters and outputs, as well as sufficient details of the underlying practical implementation of the theoretical construct. This would reduce operational risk around running specific realisations as well as enable the providers of actuarial information to perform relevant and reliable analysis of the output to present to the users.

Paragraph 3.22

We agree although we would like to see how this be achieved in an equitable and robust manner across all stakeholders.

Paragraph 3.27

Pearl strongly welcome the principle of documenting the reasoning behind judgements made about matters relating to models. Often these judgements are omitted because of their implicit nature or because of a lack of understanding. There is often a tendency to disapprove of significant changes in output even where these are justified, leading to manual adjustments which reduce transparency and coherence of the output. Any such application of material judgement should be documented clearly along with the rationale for the decision taken.

4. Do respondents have any views on the definition of materiality proposed in 3.5?

This is a crucial definition as it will decide which of the models to which we apply the strict principles of the TAS.

5. Should the modelling TAS include principles concerning need for documentation in 3.9-3.18?

Pearl believes that the subject of documentation is adequately covered throughout the paper:

- Purpose and readership of the model (3.15)
- Reasoning behind judgements made concerning models (3.27)
- Shortcomings in data inputs and impact/effect of these (5.17)
- Approach, reasoning and effects of grouping data (5.28)
- Statistical definitions used for model assumptions (5.42)
- Checks (incl objectives of checks) performed on the models (6.8)
- Reasoning for believing theoretical construct of model is representative of reality (6.20)
- Definitions of all items of data (6.28)
- Effect of removing outliers from the model (6.33)
- Reasons why sensitivity tests have not been performed on assumptions (7.29)
- Limitations of the model (7.41)

6. Do respondents have comments on proposals concerning relevance and parsimony that are presented in 4.12 and 4.17?

Paragraph 4.12

Pearl agrees with this principle and would extend it to include the need for documentation of all known relevant phenomena which includes reasons why each factor was deemed material or immaterial. Any known material phenomena not modelled should be explicit to all providers and users of actuarial information.

Paragraph 4.17

The danger with this principle is that degrees of complexity can be added to models which do make material differences to the outputs yet the models can become so complex that the outputs become difficult to predict, analyse or understand.

7. Do respondents have any comments on proposals concerning inputs and outputs that are presented in section 5, especially in 5.17, 5.28, 5.29, 5.35, 5.42 & 5.51?

We are comfortable with proposals 5.17, 5.29 and 5.35 (assumptions in models should be consistent).

Paragraph 5.28

Pearl believes that this principle should include the requirement to document the reasoning for excluding any material grouping criteria.

Paragraph 5.42

We are unclear as to whether this principle requires all input parameters to be given statistical definitions and also whether this principle requires all actuarial information to include explanations of all input parameters and their implications. If so this requirement could be incredibly onerous for complex models

Paragraph 5.51

See answer to question 10 below

8. Should modelling TAS include:

- Requirements relating to disclosure of known or suspect shortcomings in data, over and above those expected to be included in reporting TAS?

No views

- Requirements to provide any estimate of the effects of any shortcomings, and that any compensating adjustments should avoid bias?

We are of the opinion that the estimate of effects should be provided where possible. Where it is not possible, documentation should exist which states the reasoning for why this is not possible. However, we are mindful that often it is difficult to estimate the effects of data shortcomings without actually correcting the shortcomings and measuring the impact.

The application of compensating adjustments without bias is difficult in practice.

9. Should modelling TAS include a requirement that, if data grouped, the effects of the grouping should be quantified?

We believe that the requirement should be that firms demonstrate that data grouping does not lead to a misstatement of results rather than quantifying the impact of grouping (which can be difficult due to cost, time and computational restraints).

10. Do respondents agree that best estimates (and other similar estimates) should be independent of the use to which they will be put?

We agree with this; it would be confusing to have more than one best estimate however this probably reflects the uncertainty around the assumption.

11. Do respondents have any views on

- Whether biased estimates such as those concerning prudence depend on context?

We strongly agree with this. The context is vital for example the recipients of the work may set their own level of tolerance "solvency in all but 1 in 200 or 1 in 400". Often the underlying statistical distributions will not be known. The volume of homogeneous data should directly influence the degree of prudence within the assumption. One parameter can be inherently more uncertain than another requiring a larger margin for prudence

- The practicality or otherwise of requiring that the equivalent best estimate be presented alongside every prudent estimate, and the benefits to users of actuarial information of doing so?

We believe that although the suggestion sounds sensible, it could be practically difficult to implement where prudence is inherent in methodology rather than an input (for example, zeroising negative reserves).

12. Do respondents have any views on the practicality or otherwise of requiring the use of a range in conjunction with every single point estimate?

It is important for recipients to appreciate that the figures provided are estimates of reality and that there is a range of possible results. As figures normally depend on a number of parameters it would not be sensible to provide a range of results for each point estimate. However, the use of scenario/stress testing may bring out the points in a clearer and more understandable ways as interactions between parameters can more easily accommodated.

13. Do respondents have any comments on proposals concerning the fitness for purpose of models that are presented in sections 6.8, 6.12, 6.20, 6.28 & 6.33

Paragraph 6.8

We would like the BAS to reconsider the wording in this principle to make it clear that the phrase "whenever a model is used" refers to when the practical implementation is complete and before the first specific realisation has been run on which a decision has been based. A requirement to carry out and document checks every time a specific realisation is run would be far too onerous to be practical.

We are of the strong opinion that the documentation of checks should include reference to expected results and whether or not the model has attained these. Where the model has not, justification of the attained model results should be documented.

Paragraph 6.12

We agree with this principle as it aids the investigation of suspected errors whilst also fulfilling audit requirements.

Paragraph 6.20

We agree with this principle but consideration should be given to extend it to include the need to document the known areas where the theoretical construct falls short of reality and the reasons why it does so.

Paragraph 6.28

We consider that a requirement to define all items of data used in models is unnecessarily onerous.

Paragraph 6.33

We agree that this is a sensible principle when the effect of removing them is material.

14. Are there any types of model that cannot be implemented in such a way that they exhibit reproducibility?

We are unaware of such as model

15. Should the modelling TAS include a principle concerning back testing?

- Are there models for which back testing is impossible?

Pearl believes that in theory back testing should be possible for all models. However in large insurance liability projection models it is often difficult to accurately produce known results in the past because the actual past experience cannot be incorporated into the input parameter set available in the model (e.g. mortality assumptions).

- Are there practical difficulties that might arise if back testing were to be a requirement?

We are of the strong opinion that the benefits of accurately back testing a large complex ALM model are significantly outweighed by the cost and time commitments. Significant time and cost could be better spent developing other tests which would add more value

16. Would it be desirable and practical for users of external models to document the judgements they make, the checks that they perform and other relevant matters, and include explanations of the inputs, outputs and limitations in the same way as they would for models that they themselves have developed? Respondents who believe that this would not be practical should suggest alternative ways in which the objectives set out in 2.19 could be met by users of external models?

The principles should hold for all models used as it encourages the user of the external model to investigate, digest and understand the model on which they rely, but the practical implementation of the TAS for all models used may require a significant amount of work.

17. Do respondents agree that requirements for robustness and reasonableness would not be enforceable and could have undesirable consequences?

We agree in principle; however consideration should be given to introducing a requirement to include a statement in the model documentation about the robustness of the model in particular, justification of the reasons why a lack of robustness is desirable should be documented.

Similarly judgements concerning the determination of assumptions and reasonability of results should also be documented.

18. Do respondents have any comments on the proposals concerning the limitations of models that are presented in 7.29 & 7.41?

Paragraph 7.29

No comment

Paragraph 7.41

Pearl wholeheartedly agrees with this principle. However, we note that often there is a knowledge gap between the model developer and provider of the actuarial information, which could result in some of the material limitations being unwittingly excluded.

19. Does the discussion in paragraphs 7.7 – 7.24 include all the major sources of limitations in models?

Major problems arise in attempting to determine if the practical implementation meets the theoretical construct requirements. Model limitations can creep in; for example, if the model is not sufficiently robust to withstand more extreme events (divide by zero, underflow/overflow errors etc).

20. Do respondents have any comments on the advantages and disadvantages of the options set out in 7.38-7.42?

We agree that the third option over the documentation of model limitations is a sensible compromise between having no documentation at all and including documentation for all information derived from model outputs.

21. Should the modelling TAS identify specific types of limitation that should be explained in actuarial information?

Pearl recommends that the modelling TAS does identify specific types of limitation as this will aid the provision of consistent actuarial information and could be the launch pad for identifying further limitations within a specific model.

22. Are there any matters not covered in this consultation paper that should be addressed in the BAS's modelling TAS?

We would like to understand over what period you would expect companies to comply with the principles of the TAS.