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Dear Sirs

Board for Actuarial Standards ("the BAS"), *Consultation Paper on a Generic Modelling Standard*

INTRODUCTION

Ernst & Young LLP welcomes the opportunity to comment on the BAS's Draft paper entitled '*Modelling: Consultation Paper*'.

The Consultation Paper discusses the responsibilities for assessing the adequacy and accuracy of the models used for actuarial work. The Paper outlines the rationale for the principles to be used in developing the modelling standards as well as the proposed actions required from the actuary under each principle.

The overriding aim of the BAS is to establish actuarial standards that are coherent, consistent and comprehensive and thereby help to promote high quality actuarial practice. In particular, the draft principles aim to increase the reliance that users of actuarial information can place on it.

Unless the context dictates otherwise, in this letter defined terms shall have the same meaning given to them in the Consultation Paper.

Our interest

As the BAS will be aware, Ernst & Young is one of the largest global professional services organisations. We provide a wide range of audit, accounting, tax, corporate finance and other business advisory services. All of our UK activities are supervised by the Institute of Chartered Accountants in England & Wales, with further supervision over certain parts of our business by the Financial Reporting Council, the Financial Services Authority ("FSA") and other regulators.

Our interest in this Consultation Paper is threefold:

- There are over 150 members of the actuarial profession (including both actuaries and trainees) working in our UK firm in the fields of life insurance, general insurance and pensions.
- As a firm we have extensive dealings with actuaries, both in relation to insurance matters and other liabilities in our work as auditors and in a whole range of advisory services. Increasingly, actuarial matters are more and more critical to our opinions.
- As a large business supplying actuarial analysis and advice to our clients Ernst & Young LLP is itself a user of actuarial models.

We continue to recognise the important role that the Financial Reporting Council (“FRC”) plays in improving corporate governance and the quality of financial reporting, both of which contribute to the maintenance and improvement of confidence in the capital markets.

Given the importance of actuarial information to the capital markets, the BAS is an integral part of the FRC’s role and we fully support its work.

RESPONSE TO SPECIFIC QUESTIONS

The BAS has asked specifically for comments on the following issues:

1. Will the proposed purpose of the modelling TAS as set out in paragraph 2.9 help to ensure that users of actuarial information can place a high degree of reliance on its relevance, transparency of assumptions, completeness and comprehensibility?

Paragraph 2.9

“The BAS therefore believes the purpose of the modelling TAS should be that actuarial information based on models should:

- a) be based on models that sufficiently represent those aspects of the real world that are relevant to the decisions for which the actuarial information will be used;*
- b) include explanations of how the inputs to models are derived and what the outputs from models are intended to represent;*
- c) be based on models that are fit for purpose both in theory and in practice; and*
- d) include explanations of the significant limitations of the models”*

Suggested revised wording for Paragraph 2.9 with the changes highlighted:

“The BAS therefore believes the purpose of the modelling TAS should be that actuarial information based on models should:

- a) be based on models that sufficiently represent those aspects of the real world that are **understood at the time to be** relevant to the decisions for which the actuarial information will be used;*
- b) include explanations of how the inputs to models are derived and what the outputs from models are intended to represent, **and the impact of key inputs on these outputs;***
- c) be based on models that are fit for purpose, **at the time of use,** both in theory and in practice; and*
- d) include explanations of the significant **known** limitations of the models”*

2. Will the definition of a model given in paragraph 2.13 encompass the full range of models that contribute to actuarial information?

Paragraph 2.13

"A model is an abstract and simplified representation of some aspect of the real world consisting of a set of mathematical formulae and algorithms, together with inputs in the form of data and estimated parameters."

We agree with this definition of a model and feel it encompasses the full range of actuarial models. We would however, like to see the model definition extended to include the reporting of results as well as input and formulae.

It is not clear how the BAS requires actuarial standards to be applied to models that are not under the control of the actuarial function. We feel it would be helpful to clarify the scope of the application further. For example, there may be instances where actuaries have some involvement in the development and the operation of the model, but this model is owned elsewhere and not under actuarial control. It would be helpful if BAS could consider specific examples of how the TAS might pragmatically be applied in such cases.

3. Do respondents have any comments on the proposals in section 3, especially those in paragraphs 3.15, 3.22 and 3.27?

We agree with these proposals except for the comments listed below.

Principle in Paragraph 3.15

"Documentation of a model should state both its purpose and its intended readership, and be complete for that purpose and clear and unambiguous for that readership. It should contain enough detail for a technically competent person with no previous involvement to understand the matters to which the documentation is relevant and assess the judgements that have been made."

Suggested revised wording for principle in Paragraph 3.15 with changes highlighted:
"Documentation of a model should state both its purpose and its intended readership, and be complete for that purpose and clear and unambiguous for that readership. It should contain enough detail for a technically competent person with no previous involvement with the specific model in question, to understand the objectives of the model, the outputs produced to meet these objectives, the methodology used to generate these outputs, the assumptions and data required to run the model and assess the judgements that have been made."

The specific level of documentation detail referred to in the principle above may or may not be applicable depending on the nature, complexity and use of the model and on grounds of materiality. Thus it may be more appropriate to set this out as best practice rather than a requirement.

Principle in Paragraph 3.22

"The development and use of models should be proportionate to the scope of the actuarial information that has been commissioned and the benefit the user would be expected to obtain from the models, striking a balance (where necessary and appropriate) between the interests of those who pay for the information and those who use it."

Suggested revised wording for principle in Paragraph 3.22 with changes highlighted:

"The development and use of models should be proportionate to the scope of the actuarial information that has been commissioned (in line with the scope and limitations agreed with the user) and the benefit the user would be expected to obtain from the models, striking a balance (where necessary and appropriate) between the interests of those who pay for the information and those who use it."

Principle in Paragraph 3.27

"Judgements about matters concerning models should be exercised in a reasoned and justifiable manner, taking into account the purpose of the model or models in question. The reasoning behind such judgements should be documented. Judgements should be reconsidered when the models are used for purposes other than those originally intended, after a period of time has passed, or after a previously unexpected event."

Suggested revised wording for principle in Paragraph 3.27 with changes highlighted:

"Judgements about matters concerning models should be exercised in a reasoned and justifiable manner, taking into account both the purpose and expected use of the model or models in question. The reasoning behind such judgements should be documented. Judgements should be reconsidered when the models are used for purposes other than those originally intended, after a period of time has passed, or after a previously unexpected event that is pertinent to the purpose of the model being considered."

The above suggested revisions reflect our view that it is critical to ensure judgements are clearly made in respect of both purpose of the model and its expected use. This accords with the 'fit for purpose' principle.

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

Paragraph 3.5

"A departure from the modelling TAS should be considered material if, at the time the work is performed, the effect of the departure (or the combined effect if there is more than one departure) could influence the decisions to be taken by the intended recipients of the work product. ..."

Suggested revised wording for paragraph 3.5 with changes highlighted:

"A departure from the modelling TAS should be considered material if, at the time the work is performed, the effect of the departure (or the combined effect if there is more than one departure) could reasonably have been foreseen to influence the decisions to be taken by the intended recipients of the work product. ..."

Clearly knowledge is never complete or perfect and evolves over time as events occur and experience builds. We note the BAS discuss this point specifically within the Modelling CP and the objective of our proposed wording change is simply to recognise this more explicitly within the detailed principles.

In some instances this requirement could be too vague and should instead be dictated more by agreement with the client. For example, the client may decide not to reveal some material / pertinent information regarding the project (for good commercial reasons), which would have directly influenced the model had it been revealed.

5. Should the modelling TAS include principles concerning the need for documentation as discussed in paragraphs 3.9 to 3.18?

We believe that it is important that the limitations are not omitted from a single use model. If they are, this could be material, as the model may unwittingly be used for an inappropriate use in the future. However, a once off simple spreadsheet which may be used to verify a judgment from the model outputs, may have limited materiality and would require less detail than a model which is used regularly.

Principle in paragraph 3.11

"In many cases, the preparer of the actuarial information may not be the person who made the judgements or assumptions, or there may be a delay between making the judgement and preparing the actuarial information. Documenting the assumptions and judgements both ensures that they are available when the information is prepared, and provides evidence that the relevant factors were in fact taken into account."

Suggested revised wording for principle in paragraph 3.11 with changes highlighted:

*"In many cases, the preparer of the actuarial information may not be the person who made the judgements or assumptions, or there may be a delay between making the judgement and preparing the actuarial information. Documenting the assumptions and judgements both ensures that they are available when the information is prepared, and provides evidence that the relevant factors were in fact taken into account **at the time of preparation.**"*

We agree with the importance of the documentation of assumptions and judgments to highlight factors that were taken into account at the time of preparation. This could also shed light on model limitations when back testing is performed and anomalies if in the back testing explanations of deviations are needed.

Principle in paragraph 3.15

Documentation of a model should state both its purpose and its intended readership, and be complete for that purpose and clear and unambiguous for that readership. It should contain enough detail for a technically competent person with no previous involvement to understand the matters to which the documentation is relevant and assess the judgements that have been made."

Paragraph 3.18

"The BAS believes that the principle in paragraph 3.15 should apply to all model documentation, whether or not the documentation in question is required by its modelling TAS."

We are supportive of the general intent of paragraph 3.18. However we feel that the distinction needs to be drawn between those models that are:

- a) In the direct scope of the TAS;
- b) under actuarial ownership, but outside the direct scope of the TAS; and
- c) are not under actuarial ownership.

We feel that paragraph 3.18 is reasonable for those models falling into category a) and b), but not for the models falling into category c).

6. Do respondents have any comments on the proposals concerning relevance and parsimony that are presented in section 4, especially those in paragraphs 4.12 and 4.17?

Principle in paragraph 4.12

"Models should cover all materially relevant phenomena, taking into account the purpose and structure of the model or models in question."

Suggested revised wording for principle in paragraph 4.12 with changes highlighted:
"Models should cover all phenomena which could reasonably be expected to be materially relevant consistent with the state of knowledge at the time of development, taking into account the purpose and structure of the model or models in question."

The intention of the wording change is similar to that noted for 3.5 above, that is to avoid an implied requirement for perfect foresight.

Principle in paragraph 4.17

"Increasing degrees of complexity should be introduced into models if and only if they make a material difference to the outputs or materially reduce the limitations of the model in question."

Suggested revised wording for principle in paragraph 4.17 with changes highlighted:
"Increasing degrees of complexity should be introduced into models if and only if they are believed at the time to make a material difference to the outputs or materially reduce the limitations of the model in question."

The original wording might be read to require a quantification of the effects of any proposed increased complexity which we feel would be excessively onerous. For example, taken to extreme it could be required that an extremely complex model is always built in order to assess the impacts of that complexity before the model is then pared back to include only those elements having a material effect. Consequently, our view is that this

is an area where the TAS should recognise the judgment that the actuary would be required to make.

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

Principle in paragraph 5.17

“Data that is used in models should, as far as possible, be complete, accurate and relevant. Where data is, or is thought to be, incomplete, inaccurate or irrelevant, the approaches used to estimate the effects of its shortcomings or to make compensating adjustments to parameters or outputs should be documented, together with reasons for adopting them.”

We would expect issues such as accuracy and completeness to be addressed in the data TAS. There should be a requirement in the modelling TAS for the model developers and users to understand the nature of the data used and ensure it is appropriate and consistent with the model requirements. For example if the data contains age it is important to understand if age represents age last birthday or age next birthday for consistency with the model logic.

Principle in paragraph 5.28

“If grouped data is used, the approach that has been taken to the grouping, the reasons for choosing it and the effects of using grouped data rather than the ungrouped data from which it is derived should be documented.”

Principle in paragraph 5.29

“If data has been grouped and it is not possible to demonstrate that the grouping has no material effect, an explanation of the possible effects of the grouping, and that a different grouping (whether more or less detailed, or using different criteria) could give different outputs, should be included in the actuarial information.”

Paragraph 5.30 “It has been suggested that the BAS’s modelling TAS should include a requirement that, if data is grouped, the effects of the grouping should be quantified and included in the actuarial information. The BAS believes that this would be an unduly onerous requirement. In some cases, grouping is performed in order to ensure that the calculations are manageable – performing the calculations on ungrouped data would be computationally impossible.”

Suggested revised wording for principle in paragraph 5.28 with changes highlighted: “If grouped data is used, the approach that has been taken to the grouping, the reasons for choosing it and the effects of using grouped data, where known and can be reasonably quantified, rather than the ungrouped data from which it is derived should be documented.”

It will be challenging to demonstrate the effect of data grouping in all circumstances and the requirement to estimate the impact that different groupings could have on results (5.29) appears unnecessarily onerous. This should normally be done on the basis of materiality. If the effects of using grouping are unknown, this fact should be documented within the limitations of the model.

We agree with paragraph 5.30 that quantifying the effects of grouping would be unduly onerous. In general insurance grouping is very often used (eg grouping policies for a class of business for a reserving exercise) and quantifying the impact of how the data has been grouped would not be practical.

It is, however, reasonable that if the effects of grouping are known and are material, the effects of grouping should be quantified. If the effects of grouping are unknown the limitations should state this.

Principle in paragraph 5.35

"The assumptions used in a model, or in a suite of models that operate in conjunction, should be consistent, taking into account the purpose of the model or models in question."

We assume that consistency can be judged in practical terms as well as theoretical terms. One possible example of many would be if it were observed that policyholders surrender rate increased in the market downturns despite their guarantees being more valuable, modelling such behaviour would not be inconsistent simply because it does accord with a theory of rational behaviour.

Principle in paragraph 5.42

"All estimates derived from model outputs, or used as assumptions in models, should be given statistical definitions and those definitions should be documented. Actuarial information should include explanations of the estimates and of their implications."

Suggested wording change to paragraph 5.42

"Where appropriate, all estimates derived from model outputs, or used as assumptions in models, should be given statistical definitions and those definitions should be documented. Actuarial information should include explanations of the estimates and of their implications."

Given that the model documentation should be easily understood by a person unfamiliar with the model, is it the view of BAS that definitions should be given in "plain English". We are unconvinced that including statistical explanations of all the estimates will actually help us to convey the results and implications of the models more clearly to end users. While there may be a place for such detail in low level technical documents it should not be required in all communications.

In some cases providing a statistical definition will be appropriate. However, where calculations are prescribed by a regulatory authority it may not be possible to give a

statistical definition (particularly if the regulatory figure is explicitly intended to incorporate prudence).

8. Should the modelling TAS include:

- a) any requirements relating to the disclosure of known or suspected shortcomings in data, over and above those expected to be included in the reporting TAS?
- b) requirements to provide an estimate of the effects of any data shortcomings, and that any compensating adjustments should avoid bias?

- a) We agree the modelling TAS should include a requirement to disclose known shortcomings in the data, as some of this ground is expected to be covered in the Reporting TAS any additional requirements will only become clear when a final version of the Reporting TAS is issued.
- b) We agree that the modelling TAS should include a comment that any compensating adjustments should aim to avoid bias.

If the results have not been adjusted for data shortcomings, then this should be documented. An estimate of the impact of data shortcomings will not always be possible. For example calculations which are dependant on tail event data, such as under Solvency II, will never be supported by sufficient past data and will thus depend on some level of judgement taken.

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

Discussed under answers to question 7.

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

Principle in paragraph 5.51

"Outputs or assumptions that are described as best, central or reasonable estimates, or other similar terms, should be derived using methods, assumptions and judgements that are independent of the purpose of the model."

We agree that in most cases the "best estimate" should be independent of the use of the model.

We disagree that other similar estimates should be independent of the use of the estimate. The model may use estimates that are variations of the best estimate. For example, in pensions, a discount rate will vary depending on the buyer's or seller's perspective. These could be described as reasonable estimates. We feel that the explanation of the results should include the reasoning where variations on the best estimate are used.

11. Do respondents have any views on:

- a) whether biased estimates such as those concerning prudence depend on context?
- b) 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?

a) As per the response to question 10, we agree that biased estimates concerning prudence are dependant on the context to which they will be applied.

b) Requiring that the equivalent best estimate is presented alongside every prudent estimate may be a good idea and assist in demonstrating the fit for purpose requirement of the model. However, it may be onerous to produce in some cases, especially during peak reporting periods if the starting basis is not a best estimate basis. Also, it may be impractical or unnecessary to calculate a best-estimate figure for smaller calculation models used within the pensions environment.

There are situations, such as for a statutory valuation where the purpose of the calculation is to demonstrate prudence. Producing results on a best estimate basis would be an added requirement against what is currently produced if the current starting basis is not a best estimate basis. It should also be noted that if this were to apply to business written in jurisdictions outside the UK, that this would be complex and not always fit. For example in Germany and Switzerland the statutory calculations are not based on best estimates plus prudential margins. The assumptions for a statutory calculation are often on a prescribed basis. A best estimate calculation, thus, does not naturally form part of this process.

We suggest that this is dependant on the scope and purpose of the model rather than a blanket principle. It should be best practice with an element of materiality.

There is the risk that showing the prudent estimate and best estimate together may suggest to users that values fall within the range of the two values. The documentation will have to highlight that this is not the case.

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?

Overall we do not believe that it will be practical for a range to be produced along with every single point estimate. In many cases sensitivities for results are likely to be more useful and more easily understood by the user than a range estimate. We believe that a more practical approach would be that the actuary should be able to apply judgement here based on the requirements of the target audience of the results of the model.

13. Do respondents have any comments on the proposals concerning the fitness for purpose of models that are presented in section 6, especially those in paragraphs 6.8, 6.12, 6.20, 6.28 and 6.33?

Principle in paragraph 6.8

"A set of checks should be constructed and performed whenever a model is used in order to determine the fitness for purpose of the theoretical construct, practical

implementation and specific realisations. The checks that have been performed on a model should be recorded and documented. The documentation should include the objectives of the checks."

We agree with the importance of checking, and the concept of checking the model each time it is used. There should be some comments around the limitations of the checks, and which checks should be carried out in certain circumstances. It may not always be practical or necessary to carry out a full range of checks, for instance checks for ongoing use may differ from those used for development or when substantial model changes are made.

As with other documentation the checks should be documented at a level where a knowledgeable person who has not worked with the particular model would understand them. It would be onerous to require the level of documentation relating to the objectives of the checks to be understood by somebody who is not used to the subject matter.

Principle in paragraph 6.12

"Practical implementations and specific realisations of models should be reproducible."

We support this point.

Principle in paragraph 6.20

"The reasons for believing that the theoretical construct of a model is a satisfactory representation of reality should be documented."

We generally support this requirement but feel that the level of documentation should be proportional to the objectives of the model and its complexity.

Principle in paragraph 6.28

"The definitions of all items of data that are used in models should be documented."

Paragraph 6.29

"The same model may be used with data from the same source but drawn up at different times or for different purposes. However, two similar sets of data from the same source may have differences in detail. The requirement in paragraph 6.28 would apply to each data set that is used, regardless of whether it closely resembles another data set."

It is important to specify the source of the data as part of the data definition.

The requirement that definitions of all items of data being documented applying to each set of data that is used, regardless of whether it closely represents another data set could be an onerous requirement of companies. Encouraging the use of a data dictionary and documenting the changes in the definitions of items of data used in each dataset would be more realistic. The list of all data items for a model will potentially be very extensive. Some further clarity on exactly what the BAS intended here would be helpful.

We would also note that in many instances the actuary may not be responsible for checking the accuracy of the data and in such cases the actuary should be able to explain that this is the case.

Principle in paragraph 6.33

"If outliers are removed from the data used for a specific realisation other than because they are erroneous, the reasons for their removal should be documented, and the actuarial information should include an explanation of the implications."

We agree with the need to provide an explanation for the removal of outliers that are not errors. This is relevant for any calibration that requires an optimization process, for example Replicating Portfolios. Our experience is that sometimes outliers need to be discarded because otherwise they make the calibration more challenging and more difficult to explain. In such cases it will not be practical to evaluate the implication of removing the outliers.

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

Our view is that reproducibility of results is essentially a control issue and that all models should be capable of it. To facilitate reproducibility requires that data, assumptions, model versions and associated results are all linked and securely stored for future re-use. Care is needed for some stochastic models to ensure that the random seed is recorded if the simulations themselves are not eg, due to IT storage capacity constraints.

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

- a. Are there any models for which back testing is impossible?
- b. Are there any practical difficulties that might arise if back testing were to be a requirement?

We believe that there will be models which fulfill their required purpose but where back-testing may not be relevant or practical.

The results achieved when back testing is performed are highly dependent on the movements within the tested period. This assumes that what happens in the past will happen in the future. This assumption can cause potential risks for such a test where the past period of which the test is performed is not relevant to the purpose of the calculation.

Overall, we believe that back testing should be included as a strongly suggested test but not as a requirement.

16. Would it be desirable and practical for users of external models to document the judgments 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?

We agree that there should be something in the principles relating to external models and in particular it is important to distinguish the responsibilities of the external model providers and the users of these external models. It is very important that users of external models understand the rationale behind the models. It would help in avoiding the use of a “black box”. Clearly there is some sensitive information that is difficult to share for commercial reasons, and there are costs associated in producing client- friendly documentation from external providers. A robust user documentation that outlines the objective, the input, the outputs, the limitations, and the sensitivity of the results to key inputs should be part of the documentation delivered by external models suppliers. Explanations of judgments and checks performed should be documented. From a practical side there should be a requirement that the providers of the external models suitably inform and educate the users to provide this information.

We agree that providers should be responsible for providing documentation. However the burden of responsibility for understanding the documentation should be placed on the users of the models. Any areas they are unclear about they should clarify with the providers of the models.

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

We agree with this statement.

18. Do respondents have any comments on the proposals concerning the limitations of models that are presented in section 7, especially those in paragraphs 7.29 and 7.41?

Testing and the documentation of this testing should be targeted at the intended objectives of the model. The documentation should make clear what objective has been tested. This should highlight to users who use the model for alternative uses that further testing may be required to enable the use of the model for new use.

Principle in paragraph 7.29

“The sensitivity tests that have been performed, and the reasons for performing them, should be documented. The reasons for believing those assumptions (or classes of assumptions) for which sensitivity tests have not been performed to be immaterial or otherwise inappropriate for sensitivity testing should also be documented.”

*Suggested revised wording for principle in paragraph 7.29 with changes highlighted:
“The sensitivity tests that have been performed, and the reasons for performing them, should be documented to a reasonable level. The reasons for believing those*

assumptions (or classes of assumptions) for which sensitivity tests have not been performed to be immaterial or otherwise inappropriate for sensitivity testing should also be documented."

In practice we believe some reliance should be placed on the experience and judgement of the model developer to select the most significant items for sensitivity testing (for instance recognising the difference between testing required for initial model creation and for ongoing use). We agree that the items tested should be clearly documented together with the reasons for their selection.

We would note that when incorporating significant limitations of the models that the TAS should recognise that it will not be possible to list all limitations for a model in practice.

Principle in paragraph 7.41

"Actuarial information should include an explanation of why the models on which it is based address the needs of the user. It should also include explanations of the material limitations of the models that have been used and their implications."

Suggested revised wording for principle in paragraph 7.41 with changes highlighted

"Actuarial information should include an explanation of why the models on which it is based address the needs of the user. It should also include explanations of the material limitations of the models, that the modeller was aware of at the time of preparing the model, that have been used and their implications."

We support the proposed approach in para 7.41 as it is important to link the limitations of any model with the objectives it was designed to meet. If this were not done then, for example, a spreadsheet designed to sum a set of numbers might have to have its inability to multiply them listed as a limitation which is clearly inappropriate. However, if the spreadsheet were only able to sum say integer numbers then this might be an entirely appropriate limitation to note.

Regarding the implications of limitations, it will, in many cases, only be feasible to address these in a qualitative sense. Otherwise the TAS might effectively require all imitations to be addressed in order to quantify them which would detract from the purpose of the TAS to enhance the information provided to the user.

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

We agree that the discussions in 7.7 to 7.24 include all the major sources of limitations with the exception of the point below:

There is nothing on limitations of calibration when models are used to reduce the complexity, such as replacing original data with approximated model points to improve run-time (grouping is the easiest example, Replicating Portfolios is another example). Sometimes, benefits in terms of timely access to information which is required to make

decisions are more important than spurious accuracy. Therefore as the principle is “fit for purpose” there should be something in this section that allows limitation of accuracy from the calibration process provided this is well understood.

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

We have no particular comments on these paragraphs and agree with the paragraph in the principle in the third option (proposed principle in paragraph 7.41)

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

Guidance as to examples of limitations would be useful, but a requirement that each and every type of limitation should be described could be onerous. The purpose of the model should also drive the types of limitations which should be described. The examples of limitations must state that the list is not necessarily exhaustive.

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

We feel that all the matters have been covered in the modelling TAS.

General comments

This is a well written paper, and in general the principles contribute to sound model management and understanding. The paper satisfies the necessity to be generic in nature.

Although we support the general intention of setting modelling standards to increase the reliance that users of actuarial information can place on it, it is unclear how the standard will be applied in practice. The enforceability of and compliance with this Technical Actuarial Standard is unclear. For example there could be models that are used by a number of users across a number of areas with components of the model built by several individuals (not all of whom may be actuaries) or where the ownership of the data falls outside of the responsibility of the actuary who built the original model. It is unclear how the BAS envisages the responsibility for compliance with the TAS being assigned to a particular person.

It is important to ensure that any standard that is developed cannot be developed in isolation and must be consistent with those determined by other standard-setting bodies, in particular those that apply to the financial reporting community (FSA, FRC and other accounting standard setting bodies). A particular area of relevance in this regard are the emerging standards for internal model approval under Solvency II.

A key concern is that the definition of a model effectively covers the majority of calculations actuaries perform. There is likely to be a great deal of initial work required to enhance the huge current estate of models which have been developed over many years to comply with the TAS standard. Consequently, we feel it would be appropriate for BAS to include some transition provisions either within or around the TAS. For example, the principles could apply

to all the new model developments after the implementation date, but application to existing models should follow a prioritised risk based approach over a sensible timeframe.

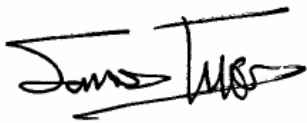
For implementation and application of the TAS we believe that considerations of materiality and proportionality will be key, particularly with respect to documentation. In practice this is likely to be a significant area for judgement and we believe that it is important that the final TAS recognises this. In particular we would caution that it is important that the proposals do not restrict or unnecessarily constrain professional judgement which is one of the key services provided to the users of the actuarial information.

Conclusion

We are grateful to the BAS for publishing the Consultation Paper and for the analysis it has put forward.

We hope that you have found our comments helpful. We look forward to reading the responses, which we hope will be posted on the BAS's website shortly, and in due course feedback from the BAS. If you or your colleagues would like to discuss any of the points raised in this letter, please contact me to discuss further.

Yours faithfully

A handwritten signature in black ink, appearing to read 'James Tufts'.

James Tufts
Partner
European Actuarial Services