Institute and Faculty of Actuaries

Risk Alert
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RISK ALERT
Model Manipulation

KEY MESSAGE
There are a number of risks associated with the use of models:
Members must exercise care when using models to ensure that the rationale for selection of a particular model is sound and, in applying that model, it is not inappropriately used solely to provide evidence to support predetermined or preferred outcomes.

What are Risk Alerts?
A series of email alerts drawing members' attention to specific issues where the IFoA asks members to think carefully about the consequences of actions they are taking.

The information in the Risk Alert is non mandatory guidance which we publish to protect the public interest. The fact that an Alert has been issued does not necessarily indicate that the IFoA expects the risk to crystallise in the near future.

This Alert is relevant for the following members

Members working in any discipline where models are used as part of the methodology.

The prolonged period of low interest rates and stressed economic conditions has resulted in reserving, valuation and pricing challenges for entities. This can lead to an increased risk of pressure being put upon actuaries to manipulate models to produce a desired outcome.

Subject matter

The manipulation of models - by which is meant either:-

(a) selecting a particular model or the use of selected models to demonstrate a desired outcome where the actuary is aware that the choice of model or assumptions is not appropriate and produces materially biased results, or

(b) optimising a position by reference to a particular model or set of parameter calibrations without reference, where appropriate, to possible outcomes from alternative models or calibrations.

A "model" is defined by a specification that describes the matters that should be represented and the inputs and the relationships between them, implemented through a set of mathematical formulae and algorithms, and realised by using an implementation to produce a set of outputs from inputs in the form of data and parameters.

Considerations for actuaries

1 **Selection of Model**

As required by various actuarial standards around the world, and as set out in Principle 2 "Competence and Care" in the Actuaries' Code (**Code**), the actuary will want to consider how to ensure the model is fit for purpose and has been subjected to sufficient controls and testing such that users can rely upon the output.

2 **Application of Model**

Should the actuary have material concerns about the appropriateness or limitations of a model, its calibration, and the resulting conclusions, then the actuary, in accordance with Principle 5 "Communication" of the Code will explain those concerns to the user. The actuary may find it helpful to include quantification or indication of alternative conclusions to illustrate his/her concerns about the appropriateness or limitations of the model.

3 **Over reliance on models**

In framing advice that is dependent on the choice of model and calibration, the actuary will want to ensure the sensitivity to the factors underlying the choice is communicated effectively, in accordance with Principle 5 of the Code, to the users of that advice.

4 **Reverse engineering of models to produce a preferred answer**

Where appropriate, and in accordance with Principle 2 of the Code, the actuary will want to ensure that models are stress tested using a wide variety of scenarios without a specific end-result in mind.

5 **Pressure to select assumptions to produce preferred answer**

It is often necessary to test different assumptions to see what the range of results could be. However, the actuary, in accordance with Principle 3 "Impartiality" of the Code should be careful not to succumb to business pressure to select particular assumptions and hence put him/her in a position of supporting a pre-determined outcome. It may also be helpful to users if the actuary communicates matters such as material uncertainty, limitations and the rationale for any deviations from the use of assumptions and the model.

Professional Obligations

Members are reminded of their obligations under the Actuaries' Code, Actuarial Profession Standards (APSs) and, for actuaries carrying out UK technical actuarial work, the Technical Actuarial Standards (TASs) produced by the Financial Reporting Council. TAS 100 contains specific provisions in relation to the use of models which must be observed. APS X2: Review of Actuarial Work will apply, and is potentially relevant to all members when using models.

Further information and support

Members may find some of the information in the "Actuarial Software and Calculations - Professional Responsibilities" Guidance produced by the IFoA in relation to the use of software by Pension Actuaries to be of relevance.

Actuaries who have specific professional questions or concerns should contact the Professional Support Service.