

July 24, 2019

Actuarial Standards Board (ASB)  
Modeling Task Force  
1850 M Street NW  
Suite 300  
Washington, DC 20036

Re: Proposed Actuarial Standard of Practice on Setting Assumptions (Second Exposure)

Dear Colleagues,

The Policy Professionalism Review Council, a committee of the Casualty Actuarial Society, has discussed the current exposure draft of the proposed actuarial standard, "Setting Assumptions (Second Exposure Draft)" and has the following comments, which group into seven main categories:

- Concerns about coordination with Actuarial Standard of Practice (ASOP) 41, and suggestions on alternatives to address those
- Suggestions to increase the clarity around what is meant by "assumptions"
- Concern with the definition of "data"
- Concern with the use of the word "significant"
- Concern with the discussion of "bias"
- Provisions that we think place an undue burden on the actuary
- Topics that we believe should not be specifically addressed
- Additional comments

First, however, we would like to say that we note with interest the debate about the title of the standard that occurred with the release of the first exposure draft. We are supportive of the current title. In particular, we think that a title like "Actuarial Assumptions" would tend to lead to a very narrow perception of scope.

## Harmony among the Actuarial Standards of Practice

Actuarial standards of practice that are applicable to all practice areas are especially difficult to write, since they must mesh well with a broad spectrum of current practice and with a large number of existing standards. We think that the topic of "Setting Assumptions" is important enough to justify this, but we also caution that care should be taken because, like a change to ASOP 1 or ASOP 41, the creation of this standard modifies the entire foundation for all the ASOPs.

Specifically, if the Task Force wishes to proceed with this as a new standard rather than a modification to ASOP 41, ASOP 41 needs to be simultaneously modified to replace §§3.4.4, 4.2, and 4.3 of that standard with references to the appropriate sections of the proposed standard. We also believe that §§3.10, 4.2(d), and 4.2(e) of the proposed standard should be rephrased to stand on their own. For example, the Task Force could use the language in §§3.4.4, 4.2, and 4.3 of ASOP 41 as a point of departure for rewriting these sections, but then rephrase to be internally consistent within the proposed standard, which contains concepts like

“prescribed assumption set by another party” that are foreign to ASOP 41. We do realize that there is language about which standard governs in case of conflict, but leaving known major conflicts unresolved poses too much risk of confusion as some readers will interpret passages to conflict where others will see no conflict. Another example of an inconsistency that is not adequately addressed by conflict rules is §3.10 of the current exposure draft, which refers the reader specifically to ASOP 41 §4.2 for prescribed assumptions set by another party, and the reader then turning to ASOP 41 will find no help.

## The Definition of “Assumption”

We have two concerns. The first concern is that the definition limits assumptions to be (numerical) values. Many critical assumptions are not numeric. For example, one of the assumptions underlying the distribution-free chain-ladder method is that the ultimate losses from different accident years are pairwise independent.<sup>1</sup> Stationarity, homoscedasticity, and the assumption that a random variable is lognormally distributed are additional examples of assumptions that are not values. “Assumption” needs a definition that includes these cases.

Furthermore, there is some confusion likely between assumptions and conclusions, especially as the proposed standard contains statements like “...data are commonly used in the development of assumptions”. This could be clarified by pointing out that the conclusion of a previous step (loss cost as an output from a predictive model, for example) may be an input to a subsequent step (e.g., to add expense and profit provisions in order to create a rate providing for all costs associated with the transfer of risk) and therefore an assumption when viewed from the perspective of the subsequent step. This may be obvious to most actuaries, but the standard also needs to be clear to lawyers and to arbitration panels. This clarification could be inserted either in the definition of “assumptions” or as a sub-item in §3.4.

For example, the Task Force may wish to consider a definition of “assumption” along the lines of:

Assumption—A value, a relationship between values, or a characteristic of a value or values that represents professional judgment or the output of a prior step of the analysis.

Some corresponding rewording of the discussion of assumptions in §1.2 might also be helpful for clarity, depending on the path chosen.

Note that this is somewhat different from our discussion of “assumptions” in response to the exposure draft on Modeling. The reason is that the extended sense of “assumption” to refer to an output of one step that is used as an input to the next step is embedded in actuarial usage but not in predictive modeling usage

## The Definition of “Data”

We believe that the proposed standard gives too broad a definition of “data” to say that “information mathematically derived from such items” are data. After all, regression coefficients are mathematically derivable from the inputs, but we hope this standard will not treat them as data. They are conclusions, or at the very least indications based on data and assumptions. (And they are potentially assumptions for a subsequent step.) The point is that most mathematical manipulation rests on additional assumptions for its validity, so it is not

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<sup>1</sup> Thomas Mack and Gary Venter, “A Comparison of Stochastic Models that Reproduce Chain Ladder Reserve Estimates”, *ASTIN Colloquium 1999*, p. 265.

appropriate to call the output “data”. We recognize that this deviates from the definition of “data” in ASOP 23, but we think this is justified because this standard needs to contrast “data” and “assumptions” in a way that is not relevant in ASOP 23.

The definition of “data” is also too narrow, in that qualitative information does sometimes need to be treated as data. For example, customer names are data (even if these are business names) and need to be handled appropriately in any statistical framework concerned with repeated measures or with subject effects. Also, modern analytic techniques can take images and sound files as data. We believe that it is appropriate to recognize that in this standard.

A possible definition of “data” would be:

Data—Objective information taken to be a direct representation of fact. Assumptions are not data, but data are commonly used in the development of assumptions.

Additionally, consistent with the above, we think that even assumptions covered in §3.4(c) of ASOP 23 should be governed by this standard, and we suggest deleting the fourth paragraph of section §1.2, which excludes such assumptions from scope.

### **The Use of “Significant”**

The word “significant” has both technical and non-technical meanings that can both be relevant and therefore it should be avoided whenever possible to avoid ambiguity. Indeed §2.12 of ASOP 1 explicitly cautions actuaries against using this word unnecessarily or without clarifying the meaning. In this case, it would be simplest to replace “significant” with “material” throughout. The modifier “material” is also more consistent with similar language in other ASOPs, such as ASOP 41, and is clearly defined in §2.6 of ASOP 1. If the Task Force really intends to introduce a new threshold distinct from materiality, extensive and thorough guidance as to its meaning and application will be required.

### **The Discussion of Bias**

We strongly urge deleting §3.4(d). Many appropriate methodologies that do not contain margins produce estimates that are both appropriate and statistically biased.<sup>2</sup> This includes traditional actuarial methodologies such as the credibility procedures used, *inter alia*, in territorial ratemaking, and mentioned in §3.1(c), as well as more recent tools such as smoothing splines, regularized models, and Bayesian hierarchical models. Indeed, credibility procedures and hierarchical models are often introduced in situations where unbiased estimators would be inappropriate and would produce results that are unstable and vary dramatically over time. As phrased, §3.4(d) would exclude very useful tools, included long-standing tools, from an actuary’s toolkit.

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<sup>2</sup> See for example Trevor Hastie, Robert Tibshirani, and Jerome Friedman, *The Elements of Statistical Learning*, 2<sup>nd</sup> ed., New York; Springer 2009 (12<sup>th</sup> printing 2017), pp. 37-38 for a discussion of bias-variance tradeoff and pp.156-161 of the same work for a discussion of bias in the context of smoothing splines. Also, note that credibility methods introduce bias in return for a reduction in mean-squared error by averaging experience data with a complement of credibility that is less directly representative of the risk and thus is typically a biased estimate.

## Unduly Burdensome Provisions

We believe that the phrase “...or could assume the assignment if necessary” in §3.11 should be struck. Usually much more than assumptions (e.g., data and often computer code) are needed in order for another actuary to assume an assignment, and we believe the scope here should be limited to assumptions, in accord with the title of the standard.

We believe §4.1(c) is unduly burdensome. For some kinds of actuarial work it is indeed important to document changes in assumptions since the most recent similar analysis—for example, work that provides an updated opinion about the value of a balance sheet amount, but not work that provides prospective loss costs estimates. In the latter case, the prior report may not be recent and may not be relevant; indeed in this case showing the change from the previous actuarial estimate may well distract from the much more important comparison (from a business perspective) of the change from charged price to indicated price. As it stands, it seems that ASOPs that cover specific work around balance sheet amounts (ASOPs 4, 36, and 43, for example) already require this disclosure whereas other ASOPs (including ASOP 29 and the very recent ASOP 53) quite appropriately do not.

## Topics that Should Not Be Specifically Addressed

We do not think a standard of this breadth should mention “margins” as we believe margins are used in only a narrow subset of actuarial work.<sup>3</sup> (Indeed, although we are accepting of the decision to leave sensitivity testing out of scope, we think sensitivity testing is more broadly applicable and would fit in this standard much more comfortably than margins do.) We think that the more general language around documenting assumptions *ipso facto* requires documentation of any margins used. Furthermore, we think it misleading to call one example out explicitly as being specifically included, as it is a fundamental interpretative principle that this calls into question whether other items that might be included in assumptions (e.g., inflationary trend) are required to be disclosed with the same level of rigor. Thus, if the Task Force feels some mention is required for clarity, we would much prefer to see the example of margins given in the cover letter or in an appendix rather than in the standard itself. This would necessitate removing “margin” from §3.4(d) (which we believe should be deleted in its entirety—see above) and deleting §4.2(a). It would also involve either deleting §3.3 or replacing it with a discussion of the propagation of uncertainty from one step in an analysis to the next.

In the responses to comments on the first exposure draft, the task force stated that the word “model” is not included in the standard. However, the word “modeled” appears in §3.2(b), and we believe rewording could easily avoid this. For example, one could replace “such as industry experience that is properly modified to reflect the circumstance being modeled” with “such as industry experience with appropriate modifications to reflect the situation under consideration”. However, we would prefer the simpler approach of simply deleting this clause from §3.2(b). We would prefer to treat adjusted data as the conclusion of a step that began with data (industry data) and assumptions (resulting in those proper modifications) as inputs. The conclusion of this step may then be an *assumption* (not *data*) underlying the next step. We think that treating adjusted data as data is a slippery slope.

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<sup>3</sup> Indeed, in work involving transactions, including any work involving pricing or risk transfer, margins make little sense. Which party to the transaction deserves the benefit of a margin?

## Additional Comments

- We think that §3 should be re-arranged to put §3.4 first and a combined §3.5/3.6 second. Doing otherwise buries the lead. We believe that §§3.5 and 3.6 can be readily combined by replacing the concepts of “reasonably consistent” and “reasonable in the aggregate” with the single concept of “collectively reasonable”.
- We believe that in order to keep §3.4 and §3.2 consistent with each other, §3.4(c) should read “it takes into account information, as guided by section 3.2” rather than “it takes into account experience, as discussed in section 3.2”.
- We suggest rephrasing §3.2(c) to make it clear whether the market data being referred to is data from the financial markets (e.g., interest rates or stock indices), data from insurance markets (such as competitor prices and market share), or both.
- The intended relationship between §3.9 and §3.10 is unclear. For example, it is not clear whether “Others” in the title of §3.10 refers to people other than the actuary doing the work or whether it refers only to non-actuaries. It’s unclear why ASOP 41 is referenced in §3.10 but not in §3.9.
- We think §3.10 needs to distinguish between what an actuary should do when unable to determine the reasonableness of an assumption supplied by a non-actuary and what the actuary should do when he believes that the assumption supplied by the non-actuary is unreasonable.
- Finally, while we would prefer §4.1(c) be deleted, we note that it is ambiguously phrased. It is not clear whether “to the extent known and readily available” modifies “material changes” or “most recent actuarial findings”.

We thank the Task Force for their efforts and hope that they will find these suggestions useful.

Regards,

Christopher Monsour, Chair

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