

Generator of Economic Scenarios (GOES) (E/A) Subgroup Exposure: Due 11/14/24

The GOES (E/A) Subgroup requests comment on the following questions. Please see the attached presentation for more information, along with the excel tool included in the exposure for more information.

SERT Scenarios:


1. Should an adjustment be made to the threshold for passing the SERT scenarios, or some other modification?

DR Scenario:

2. Should the same formula for the DR scenario be used in the GOES scenarios?
3. What information would be needed to make a decision (e.g. model office testing of different options)?

Scenario Statistics:

4. The NAIC and Conning have been providing statistics to help interested parties review scenario sets in [Excel](#) and [PDF](#) form. Conning and the NAIC are exploring the potential of co-developing a single package of statistics for release that would utilize PowerBI. An example of the of the capabilities of the statistical package is in this link - [New NAIC Report](#). Please let us know if you think this is a desirable way to distribute the statistics.



Note: A revision was made to the charts displayed on slides 5 and 6 of this presentation. One field test participant was omitted from the data, and has been added in this version of the presentation. This impacted the Term Reserving Category for the Baseline and FT1 runs. The charts on slide 7 already accounted for this participant.

GOES (E/A) Subgroup: SERT Scenarios (Cont.) and Scenario Selection

October 16th, 2024



Agenda

1. SERT Scenarios and DR
2. Scenario Selection

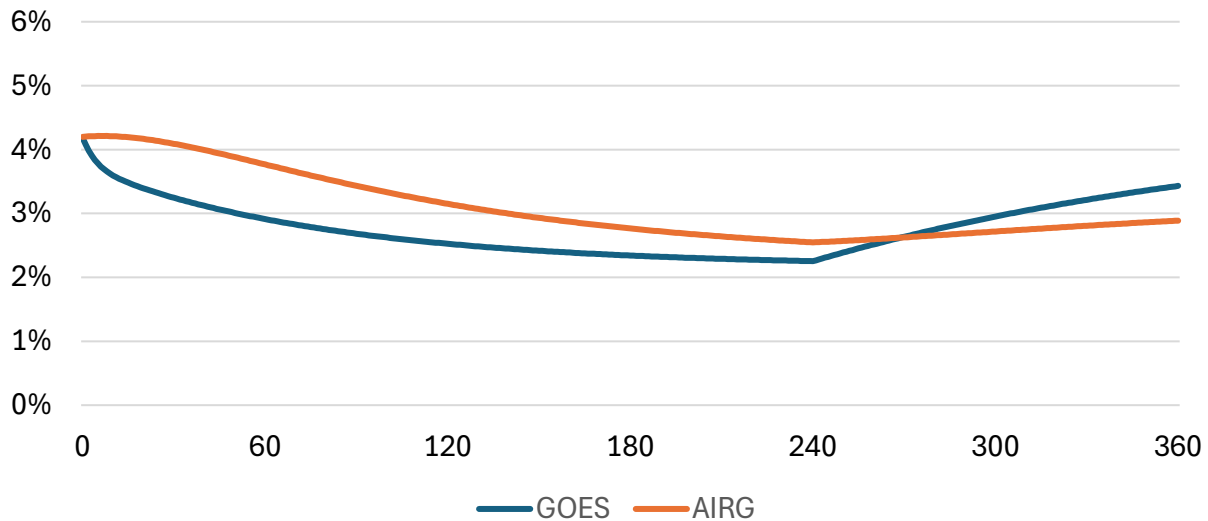
Field Test Participant Feedback: SERT Scenarios and DR

SERT Scenarios

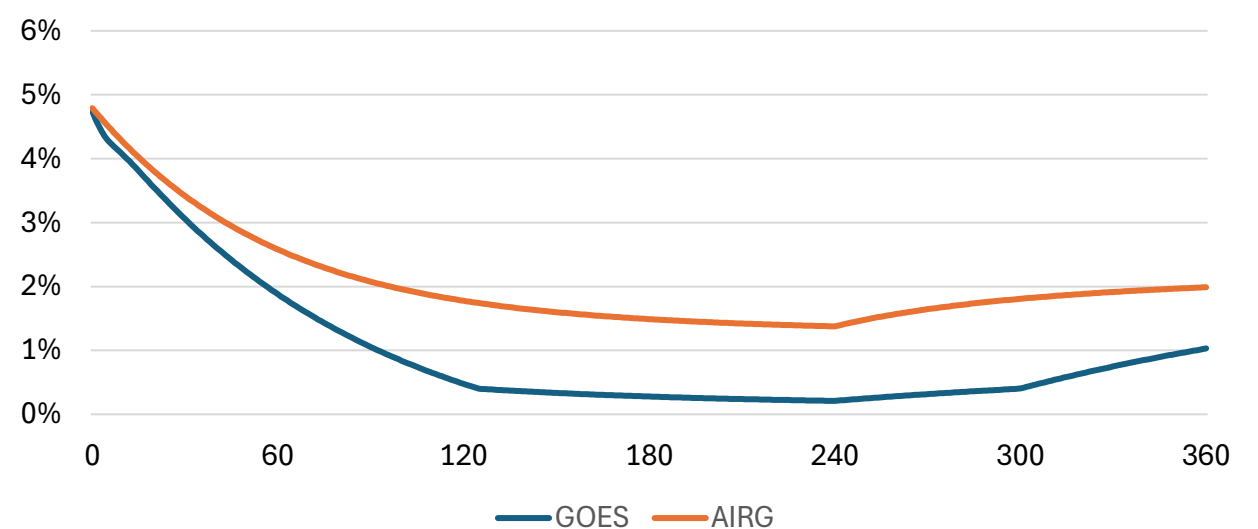
Participant Feedback:

- Recalibrate the SERT scenarios to be less extreme; Consider increasing the SERT passing threshold above 6% to address conservatism in the SERT scenarios.
- [One participant's Term model segment passed the SERT, but company calculated an SR that was in excess of both their DR and NPR for the baseline and field test scenarios. This was a new SR model for them.]
- Calibration of deterministic scenario for valuation is beyond moderately adverse.

Scenario 12 (DR Scenario), 20YR UST, 12/31/23



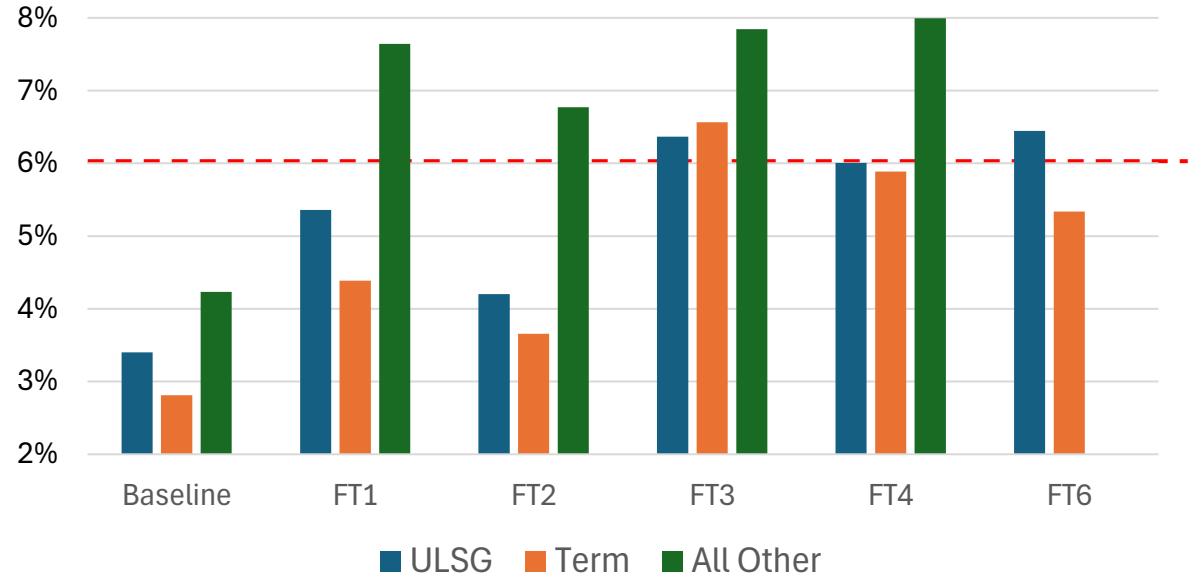
Scenario 12 (DR Scenario), 1YR UST, 12/31/23



2024 Field Test Participant SERT Results

- For the 12/31/23 GOES FT1 scenarios compared to the Baseline (AIRG) SERT scenarios:
 - The average SERT ratio increased across all VM-20 reserving categories, and
 - Each reserving category saw one participant's model segment that had passed with the Baseline fail with the GOES SERT scenarios.
- The average SERT ratio across each reserving category was significantly impacted by increases to the model segment that failed with the Baseline
- FT3 ("Up Rate Shock") saw the most model segments fail, particularly in the term model segment.
- No additional "All Other" model segments failed the field test SERT scenarios

Average Participant SERT Ratio by Reserving Category

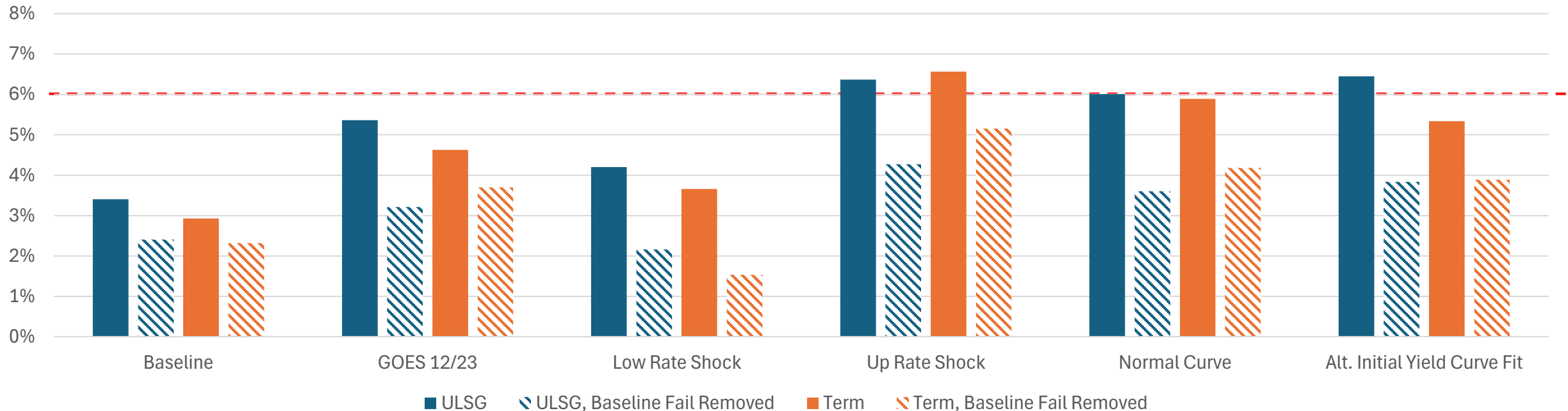


Number of Passing Participant Model Segments/Total Participant Model Segments

VM-20 Reserving Category	Baseline	FT1 12/31/23	FT2 Low Rate Shock	FT3 Up Rate Shock	FT4 Normal Yield Curve	FT6 Alt. Initial Yield Curve Fit
ULSG	6/7	5/7	6/7	4/7	5/7	4/6
Term	10/11	8/10	7/8	3/7	5/7	5/7
All Other	4/5	4/5	4/5	4/5	4/5	

2024 Field Test Participant SERT Results, continued

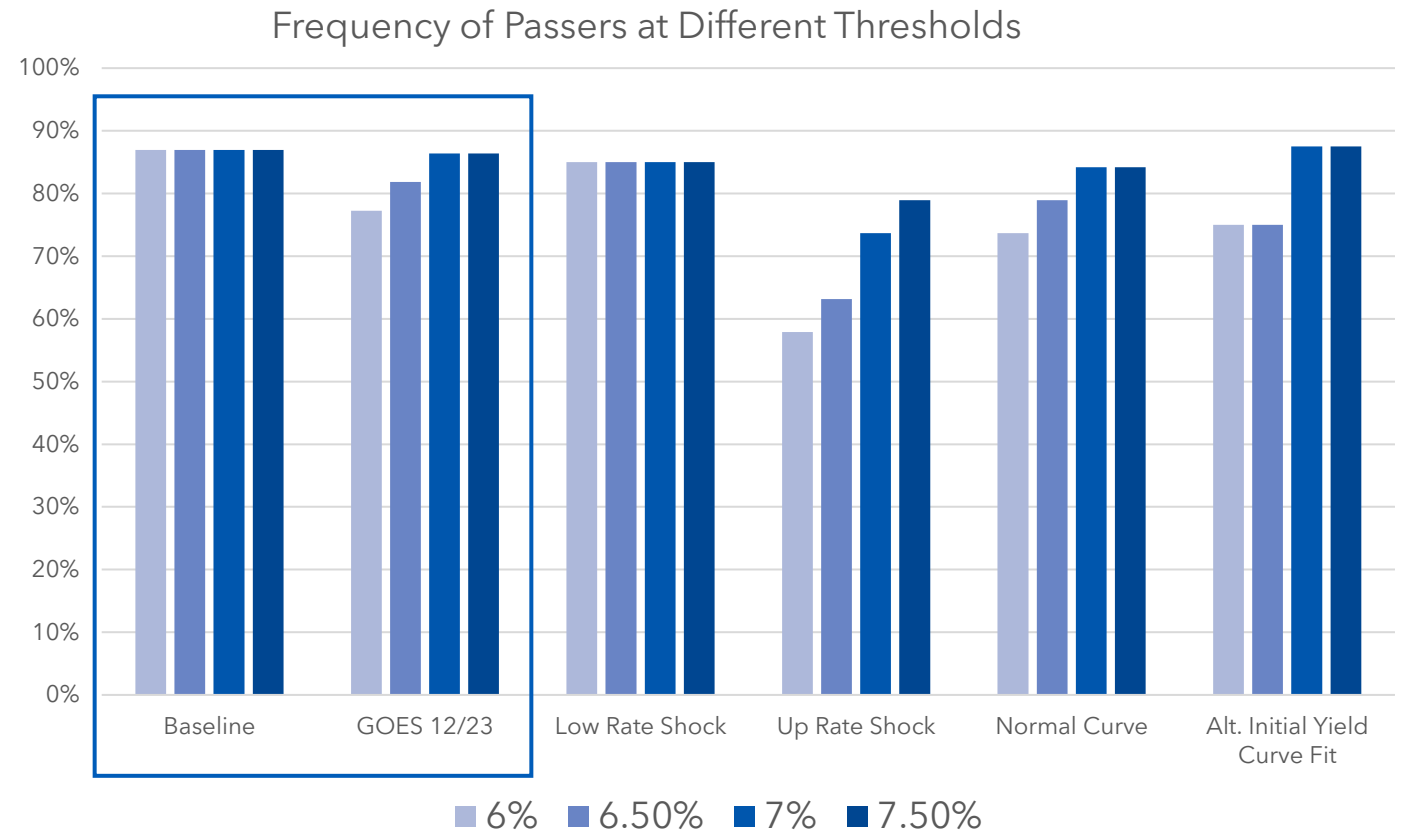
- For the Term and ULSG reserving categories, when the model segment that is failing in the baseline is removed:
 - the average SERT ratios go down significantly.
 - the average SERT ratio is never above the passing threshold.
- There were not enough participants to show for the "All Other" VM-20 Reserving Category



2024 Field Test Participant SERT Results, continued

- 87% of the field test participants' model segments passed the SERT in their baseline YE23 run with a 6% threshold. This number dropped to 77% for the FT1 YE23 scenarios. Increasing the threshold to 7% brings the participant passing rate back up to a similar level.
- 58% of the FT3 (Up Rate Shock) field test participant model segments passed the SERT at the 6% threshold, increasing to up to ~80% if the threshold is increased to 7.5%. Note, we do not have comparative data on the frequencies of participants that would pass using the FT3 starting yield curve and AIRG SERT scenarios.
- **Question:** Should an adjustment be made to the threshold for passing the SERT scenarios, or some other modification?

Frequency of Passing SERT by Field Test Run All VM-20 Reserving Categories



DR Scenario

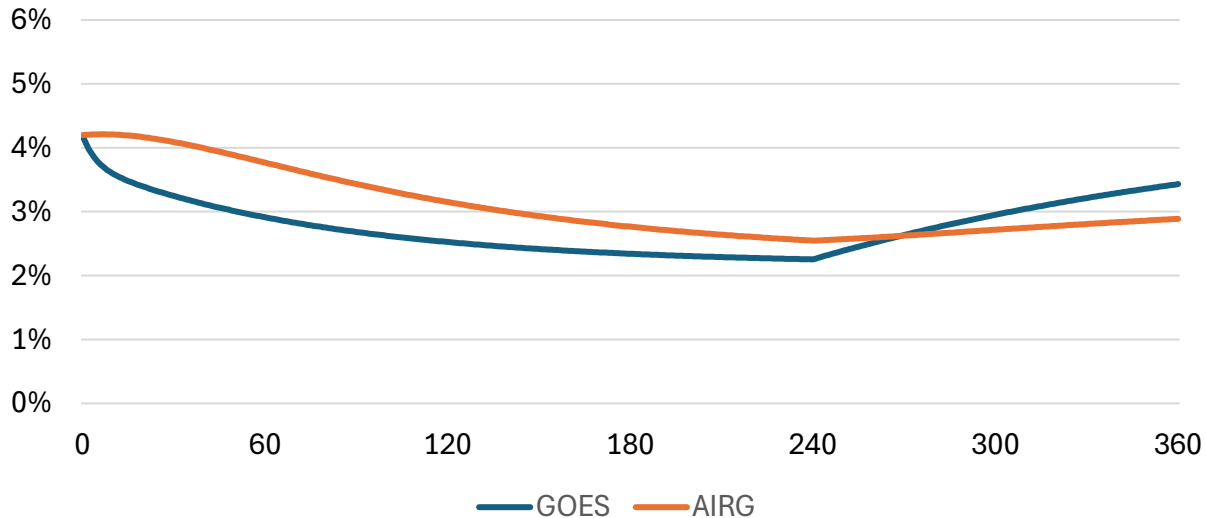
Scenario 12 - Deterministic scenario for valuation

There are uniform downward shocks each month for 20 years, sufficient to get down to the one standard deviation point (84%) on the distribution of 20-year shocks. After 20 years, shocks are zero.

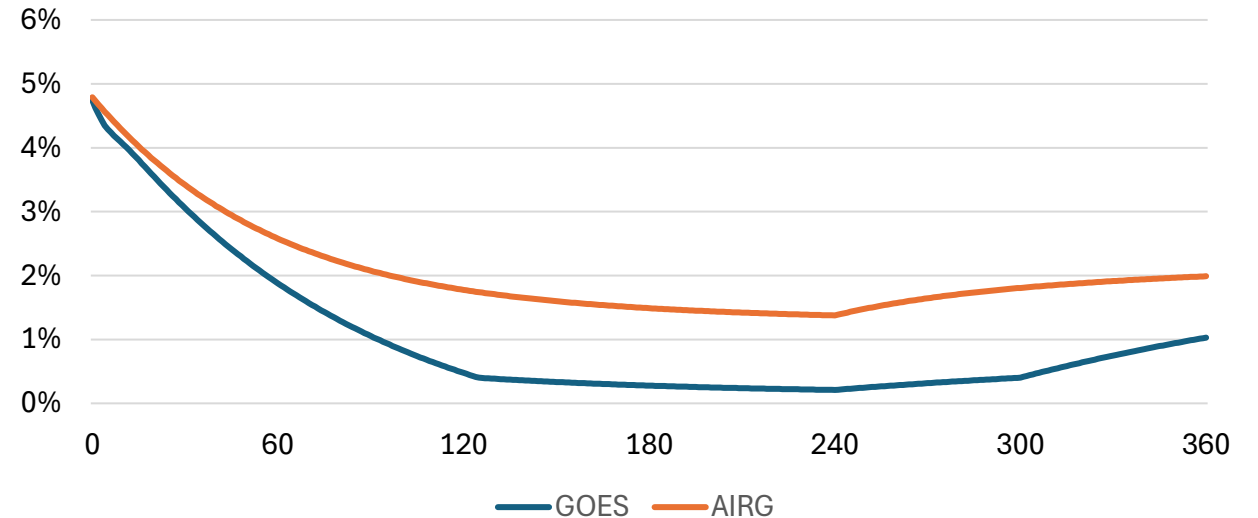
Questions:

1. Should the same formula for the DR scenario be used in the GOES scenarios?
2. What information would be needed to make a decision (e.g. model office testing of different options)?

Scenario 12 (DR Scenario), 20YR UST, 12/31/23



Scenario 12 (DR Scenario), 1YR UST, 12/31/23



Scenario Selection

Scenario Selection - Background

- One of the components of the Academy Interest Rate Generator which needs to be replaced is the Scenario Picker Tool. This tool creates subsets (i.e., 50, 200, 500, and 1000 scenarios) from the full set of 10,000 scenarios, which can be used to reflect the full distribution.
- Currently, if a scenario subset is used in reserve calculations, VM-20 prescribes use of the scenario picker tool but VM-21 does not. Applicable VM language is shown below.
- VM-31 contains requirements for companies to demonstrate their compliance with applicable VM-20 and VM-21 language.

VM-20 Section 7.G.2:

- c. Use of fewer scenarios rather than a higher number of scenarios is permissible as a model efficiency technique provided that:
- i. The smaller set of scenarios is generated using the scenario picker tool provided within the prescribed scenario generator, and
 - ii. The use of the technique is consistent with Section 2.G.
- d. The number of scenarios required to comply with Section 2.G will depend on the specific nature of the company's assets and liabilities and may change from time to time. Compliance with Section 2.G would ordinarily be tested by comparing scenario reserves of a simpler model or a representative subset of policies, run using the reduced scenario set, with the scenario reserves of the same subset or simpler model run using the larger scenario set.

VM-21 Section 8.F:

1. For straight Monte Carlo simulation (with equally probable "paths" of fund returns), the number of scenarios should typically equal or exceed 1,000. **The appropriate number will depend on how the scenarios will be used and the materiality of the results. The company should use a number of scenarios that will provide an acceptable level of precision.**
2. Fewer than 1,000 scenarios may be used provided that the company has determined through prior testing (perhaps on a subset of the portfolio) that the CTE values so obtained materially reproduce the results from running a larger scenario set.
3. Variance reduction and other sampling techniques are intended to improve the accuracy of an estimate more efficiently than simply increasing the number of simulations. Such methods can be used provided the company can demonstrate that they do not lead to a material understatement of results. Many of the techniques are specifically designed for estimating means, not tail measures, and could in fact reduce accuracy (and efficiency) relative to straight Monte Carlo simulation.
4. The above requirements and warnings are not meant to preclude or discourage the use of valid and appropriate sampling methods, such as Quasi Random Monte Carlo (QRMC), importance sampling or other techniques designed to improve the efficiency of the simulations (relative to pseudo-random Monte Carlo methods).

Scenario Selection

Excel-based Scenario Selection Tool Used in 2024 Field Test:

- For the 2024 GOES Field Test, an excel based scenario selection tool was utilized by participants to determine their scenario subsets from the 10k set.
- The tool is able to select scenario subsets based off of the 20-year UST significance measure or equity GWFs from the Large Cap fund. Both values are calculated from the relevant scenario set by Conning and included as a separate input for use in the tool.
- As currently configured, the tool allows the user to select any number of scenarios up to 1,000.
- The user can also specify whether spot rates, coupon yields, or both should be output.

Question: Does this tool meet the needs of regulators and the industry?