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Complying with the XXX ASOP

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The new line of generation-XXX term and UL products is here, and with them come questions about how to apply the model regulation in valuing life insurance policies. Although some questions might involve the new standards for basic reserves, or others the issue of contract segmentation, most tough ones involve X Factors. The Actuarial Standards Board (ASB) has addressed this topic with a proposed Actuarial Standard of Practice (ASOP).

What X Factors Can I Use?

THERE ARE TWO SETS of tests for the X Factors that companies may use to lessen valuation mortality for deficiency reserves in a product's first segment. Both sets contain two distinct tests. The first set of tests is simple and requires no analysis of anticipated mortality:

- No X Factor can be less than 20%, and
- X Factors may not decrease in successive policy years.

Subject to these rules, X Factors can be established by the actuary and may vary by factors such as policy year, policy form, underwriting class, and/or issue age. It is also important to understand that the second test applies only to a set of X Factors at a given valuation date. If, for example, a company used constant X Factors of 30% for its preferred class, and later years' analysis proved that this could be dropped to 25% on both new and inforce business, this would be allowable for the policies in force (because as an overall assumption, the 25% is also non-decreasing by duration).

The second set of tests compares X Factor adjusted mortality to anticipated mortality, without improvement beyond the valuation date. According to these tests:

- The present value of X Factor adjusted mortality must be at least as great as

the present value of anticipated mortality, and

- X Factor adjusted mortality must be at least as great in each of the 5 years following the valuation date, as anticipated mortality.

The test period for these tests is limited to the first segment. The tests are straightforward, but require actuarial judgment in assessing anticipated mortality.



How Does the ASOP Suggest That I Select These X Factors?

THE SELECTION OF X Factors according to the ASOP should be based upon the best estimate of anticipated mortality. As pointed out previously, however, this best estimate should not take future mortality improvement into account — it should be based upon current experience only.

In theory, it is conceivable for a company to have only one set of X Factors for all its policies. More likely, however, even a small company will have at least a few sets of X Factors in use across its lines of business. If so, the ASOP refers to each of these as an "X Factor Class." For each X Factor Class, an anticipated mortality assumption will be needed.

X Factors should produce valuation

mortality that would be expected to pass both tests in the Model Regulation, when compared against the anticipated mortality assumption. The less certain you are of your anticipated mortality assumption, the more conservative you may wish to be in setting X Factors. Otherwise, your company may be subjected to adverse accounting effects, if and when experience forces X Factors upward.

According to the ASOP, the best possible experience used for establishing an anticipated mortality assumption would be relevant company experience, if credible. If this is not available or credible, the next best sources in order of preference are:

- experience on similar types of business in the same company
- experience on similar types of business in the other companies, including reinsurance companies
- other sources of relevant experience

As a last resort, if all of the above sources fail to form a credible basis for an assumption, the actuary may use actuarial judgment in setting an assumption.

The ASOP points out that for studying relevant experience to form an anticipated mortality assumption, exposures based on face amount or units of insurance are more meaningful (from a solvency standpoint) than exposures based on numbers of policies. It also points out that when deciding on a historical study period for mortality, there is a trade-off between having enough data (which would tend to lengthen the period) and having relevant data (which would tend to shorten it).

In What Ways Will I Have to Review My X Factors as Experience Emerges?

ANY COMPANY THAT HAS at least one X Factor on any policy that is less than 100% will need to file an annual opinion and supporting actuarial report, based on

asset adequacy analysis. The opinion must state that all X Factors in use meet the requirements of the Regulation, and this statement covers all policies subject to the model, not just those with X Factors less than 100%. Such policies without X Factors assigned are tested as though they have X Factors of 100% at all durations.

On the other hand, the ASOP defines policies subject to the Model Regulation as being only those that use the Model Select Factors for calculating deficiency reserves. Policies using only 1980 CSO with or without the 10-year select factors are not subject to the Model Regulation.

Because of this set of requirements, any actuary who needs to file an opinion including an analysis of X Factors must annually review experience on XXX policies as it unfolds. The ASOP states that experience should be reviewed first for each X Factor class alone, and then in aggregate across the company. If at either level, testing suggests raising the assumption, this should be done, and

expressly state that this is not the only acceptable methodology.

On the other hand, a statistical framework is a generally accepted actuarial means of validating assumptions like anticipated mortality. This may aid greatly in terms of its being deemed justifiable, relative to other approaches.

The background section of the ASOP spends some time on some of the statistical methods available for evaluating anticipated mortality in light of emerging experience. However, this section is not actually part of the ASOP, and thus is not binding on Academy members. Some of the issues addressed in this section are Monte Carlo methods, hypothesis testing, and credibility methods.

Why Might I Need Monte Carlo Simulation?

REMEMBER THAT THE ASOP recommends that to be appropriately done, the anticipated mortality assumption should be tested in terms of face amount, not policies. At year-end, each company will have

The general idea involves assigning each policy a "q," based on the assumed anticipated mortality. One simulation would involve generating a random number between 0 and 1 for each policy, and summing the face amounts of all policies for which the random number was less than the "q." This would be the total face amount paid on deaths for that trial. By repeating this an infinite number of times, the distribution of deaths by face amount implied by the anticipated mortality assumption would be spelled out completely. In practice, some finite number of trials will suffice to tell the actuary where his actual experience came out relative to expectations.

Again, although Monte Carlo simulation could clearly be useful, the ASOP does not imply that this methodology is necessary to meet the standards imposed by the Model Regulation.

Summing Up

THE ASOP IS STILL in the exposure stage as I write this article. It is possible, therefore, that there may be significant changes to it before it becomes final. However, in any case, the XXX Model Regulation and accompanying ASOP will certainly lead to some interesting work for valuation actuaries this coming year-end.

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then the assumption retested before moving on.

Unfolding actual experience is viewed using exposure units based on face amounts of insurance, not policies. It is also viewed gross of reinsurance, according to the ASOP.

Is There a Specified Form of the Test for Anticipated Mortality?

ACCORDING TO THE ASOP, the actuary must do some sort of analysis that he or she can justify to demonstrate that assumed anticipated mortality is appropriate, in light of emerging experience. A statistical methodology seems to be suggested, but the ASOP chose to

a block of policies that all have annual rates of mortality suggested by the actuary's anticipated mortality assumption. Using a Poisson or Normal approximation, it is possible to develop an explicit distribution for the number of deaths that should have occurred.

But when the testing is by face amount, there is no statistical theory for developing a distribution for a block of policies. Monte Carlo simulation makes it possible to test the actual experience of face amount paid out in death claims against the distribution of expected claims suggested by the anticipated mortality assumption. The actuary can then make an accept/reject decision grounded in analysis, as well as judgment.