



AMERICAN ACADEMY *of* ACTUARIES

Analysis and Recommendation on the Greatest PV of Accumulated Deficiencies (GPVAD) Approach for Life Products from the American Academy of Actuaries' Life Reserves Work Group

**Presented to the National Association of Insurance Commissioners'
Life and Health Actuarial Task Force**

Washington, DC - June 2006

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Life Reserves Work Group

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Analysis and Recommendation on the Greatest PV of Accumulated Deficiencies (GPVAD) Approach for Life Products

The LRWG has spent considerable time this past quarter reviewing the pros and cons of implementing a Greatest PV of Accumulated Deficiencies (GPVAD) approach versus the current proposal which is based on a Gross Premium Valuation (GPV) approach. At a very high level, the two approaches can be described as follows:

GPV reserve = the PV of future benefits and expenses less the PV of future gross premiums

GPVAD reserve = starting assets plus the greatest PV of accumulated deficiencies, where the accumulated deficiency for each year in the projection is determined by taking the difference between the working reserve (a proxy for the statutory reserve) and the accumulated assets.

A key difference between the two methods is that the GPV approach allows positive surplus that may arise in some years of the projection to offset deficiencies that may arise in other years of the projection, while the GPVAD approach does not allow such offsets.

Attached is a chart summarizing the pros and cons of using the GPVAD approach compared to staying with the GPV approach. In this summary, the following were assumed:

1. The working reserve is assumed to be the cash value, similar to the approach used in VACARVM. This represents a problem for life products, since unlike variable annuities, some life products do not have cash values.
2. The same CTE level is assumed for both approaches to determine the final reserve requirement. Some have stated that the use of GPVAD approach justifies a lower CTE level than using a GPV approach.
3. Asset adequacy analysis is still required to determine the need for additional reserves under either approach.

Recommendation to LHATF

At this point, the recommendation of the LRWG is to continue using the GPV approach for life products. The rationale for the recommendation is:

1. The benefits and guarantees of life products do not generally lead to the large interim deficiencies that can arise for variable annuities. Hence, there is not as urgent a need to implement an approach for life products that reflects the greatest PV of accumulated deficiencies. An exception might be in situations where guaranteed benefits are offered on variable life contracts that are similar to those offered on variable annuities.
2. For many products, the GPVAD reserve will be equal to, or very close to, the GPV reserve.
3. Many of the risks that can give rise to future interim deficiencies for life products are related to policyholder behavior (e.g. lapses, premium patterns) that can be adequately addressed by proper conservatism in valuation assumptions for these items.
4. It avoids the need to address the complex issue of defining the working reserve, particularly in light of the large diversity in the types of life products, such as products with and without cash values, products in a closed block, etc.
5. For tax purposes, the GPV method is closer to CRVM than the GPVAD method, unlike variable annuities, where GVPAD is consistent with the concepts of CARVM.

The LRWG recognizes this decision does not lead to a perfect answer, in that it is likely that it will be inconsistent with the recommendation for annuities and risk-based capital, which will likely use an accumulated deficiency methodology. However, at this time, the considerations noted above lead the LRWG to recommend that a GPV method be adopted for life products.



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Pros and Cons of Using Greatest Present Value of Accumulated Deficiencies Approach from the American Academy of Actuaries' Life Reserves Work Group

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Pros and Cons of Using Greatest Present Value of Accumulated Deficiencies Approach When Calculating Reserves for Life Insurance Products

| | Issue/Observation | Pro | Con |
|----------|--|---|--|
| 1 | Applied on a seriatim basis, GPVAD selects maximums at various durations and adds them up, although a stochastic model would not project this combined loss actually occurring for any scenario. | Would alleviate concerns that GPV reserves don't capture all future deficiencies. | Seriatim GPVAD reserves are likely to be significantly redundant due to the fact that the greatest deficiency could be at different durations. |
| 2 | The reserve method may affect deductibility for federal income tax. The more different a reserve method is from current CRVM, the greater risk that the reserve might not be deductible. | | The GPVAD reserve method is "more different" from the current CRVM. |
| 3 | Risk-based capital C-3 factor for life insurance (and all other products) is likely to be on a GPVAD basis. | Using GPVAD for reserves would allow the use of the same model and, to a large extent, the same runs, for reserves and risk-based capital. | The hardest part of the modeling is developing the cash flows for the scenario set; with forethought, the GPV and GPVAD values could be calculated simultaneously with minimal extra work. |
| 4 | Accumulated deficiencies are considered in cash-flow testing (CFT) | Using GPVAD would be consistent with CFT, and there might be calculational synergies. Also, CFT is now used to check adequacy of reserves, so it seems natural to use same approach to calculate PBR. | Although CFT checks GPVAD, deficiencies do not automatically require a reserve increase, as would be the case if used for PBR. |
| 5 | GPVAD captures intermediate deficiencies, while GPV does not. | Would alleviate concerns that GPV reserves don't capture all future deficiencies. | For general account life insurance, intermediate deficiencies represent a temporary financing issue which should be covered by capital requirements, not reserves. |

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| 6 | Some products are projected to develop positive cash flows in their final durations. Concern has been expressed by some that these positive cash flows may not materialize. GPVAD would give no credit to such late duration positive cash flows, whereas the GPV would give credit | Final duration profits were the issue that led to Regulation XXX. Late duration profits that did not materialize were the cause of losses with Canadian term-to-100 products. | Late duration profits calculated under prudent best estimate assumptions and subject to PBR governance should be given appropriate credit. Not to do so would create the problems, such as reserve redundancy, associated with artificial rules of the sort that PBR is intended to ameliorate. |
| 7 | Variable annuity reserves are likely to be on a GPVAD basis. | Using GPVAD would make it easier to aggregate annuity and life insurance reserves. Using different bases for life insurance and annuities could result in arbitrage opportunities in the capital markets. | Can aggregate capital in any case. |
| 8 | New products and riders are being developed and introduced which blend benefits currently available on life, health and annuity products. | Reserve methods would consistently value product benefits, risks and revenue regardless of whether provided in combined or separate products. | Reserve levels could be different due to methodology differences between stand alone product types and blended benefit products. |
| 9 | Does the reserve properly capture the risk? | | The GPVAD applied to life insurance products sometimes leads to varying levels of tail coverage for unanticipated and non principles-based reasons. |
| Other Considerations | | | |
| It is harder to find a natural candidate for the working reserve than is the case for annuities. If the working reserve is a calculated amount, the calculations become complex. | | | |
| Calculation and auditing would be time-consuming | | | |
| If working reserve equals cash value, GPVAD would indirectly impose a cash value floor on each scenario within the CTE calculation. | | | |