



AMERICAN ACADEMY *of* ACTUARIES

**Status Report of the American Academy of Actuaries C-3 Subgroup
Recommended Approach for Setting Regulatory Risk-Based Capital Requirements for
Variable Account Guarantees**

**Presented to the NAIC's Life Risk-Based Capital Working Group
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Overview:

Following the “C-3 Phase I” project, the American Academy of Actuaries (Academy) C-3 Subgroup of the Life RBC Committee has agreed on an approach to be recommended to the National Association of Insurance Commissioners. The approach involves setting capital requirements for fixed guarantees (both living benefits and death benefits) with reference to variable products. The following conclusions are still just working premises, but they appear to be fairly solid. The issues that remain are “implementation” ones.

Phase I of the project recommended the determination of capital requirements for interest sensitive products by scenario testing (October 1999 report; available at: www.actuary.org). Benefiting from the work done by the Academy on Variable Annuity Guaranteed Living Benefits (VAGLB - see Sept, Dec, and June 2000 reports at www.actuary.org) and by the Canadian Institute of Actuaries on “Segregated Fund Guarantees” (available at: www.actuaries.ca), the subgroup was able to reach this recommended approach.

Summary:

The favored approach is to run stochastic scenarios using a calibrated fund performance distribution function, and using prudent best estimates of parameters, for the entire book of guaranteed variable business on an aggregated basis. The measure of required capital for each scenario is consistent with the metric used in C-3 Phase I: under each scenario, the year by year accumulated statutory surplus is calculated, reflecting estimated statutory reserves, Federal Income Tax, and expenses. For each scenario, the point in time with the greatest present value of statutory loss is chosen and that PV tabulated. The scenarios are then sorted on this measure. Unlike the Phase I project, we are favoring the approach introduced in the CIA work and recommending the use of CTE 90%: the arithmetic average of the worst 10% of all scenarios, with no scenario being calculated as a negative loss. Note: this establishes capital requirements above the starting reserve level, so the stronger the current reserve the lower the capital requirement.

For “Guaranteed Minimum Income Benefits”, the risk to expected margins in the purchase rate from uncertain future interest rates will be reflected in the modeling. An equity fund’s degree of volatility will be reflected in the modeling. Reinsurance and hedging will also be reflected. For hedging, an adjustment to the modeled result may be made (reflecting basis risk, gap risk, and cost risk).

The way grouping, sampling, number of scenarios, and simplification methods are handled is up to the actuary. However, all these methods are subject to Actuarial Standards of Practice (ASOP), supporting documentation, and justification requirements. Actuarial certification will be required. A material change in model (or assumptions), from that used previously, may require regulatory disclosure and review, and also be subject to regulatory disapproval.

Future Issues:

The above working premises seem fairly solid. Some key implementation issues are:

- Nature of calibration requirements for broad stock market fund;
- For other types of funds, how to categorize and calibrate;
- How prescriptive the requirements should be;
- Estimation of interim reserves;
- How to adjust hedge credit;
- Scope, particularly with regard to indexed products;, and
- Comprehensiveness of actuarial report; Sensitivity analysis; Conditional Tail Expectation (CTE) 95%?

Appendix: Points of difference between current, our working premises, and the CIA paper.

In general, we are studying the RBC standards for variable annuity guarantees and are coming to the same conclusions and solutions as were reflected in the CIA report last year. There do seem to be a few points of difference, however:

- a) Base-line calibration to U.S. markets instead of Canadian data;
- b) Method of working around the reserve (since the Commissioners' Annuities Reserve Valuation Method – CARVM, reserves do not follow the stochastic methodology);
- c) Flooring against estimated interim values;
- d) Calibration: fewer points, some on “right tail”, some “shape” constraints;
- e) Way to categorize and model equity funds other than quasi-index funds;
- f) “Prudent best estimate” instead of “Provisions for Adverse Deviations” (PfAD); and
- g) Perhaps more control of assumptions and methods, either by specifically limiting them or by more explicit standards of regulatory review and/or approval.