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Current AAA Recommendation for RBC C-3 Phase II

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Recently there has been a number of articles detailing large losses and accelerated DAC amortization of equity-driven products. This has confirmed that better methods are required, both to value these product lines and to set capital requirements. Recognizing this, the Life Risk Based Capital Working Group of the NAIC (LRBCWG) asked for a recommended capital standard from the American Academy of Actuaries (AAA). In response, the Life Capital Adequacy Subcommittee's C-3 Work Group (the Work Group), chaired by Bob Brown, formulated an approach for setting regulatory risk-based capital requirements for variable products with guarantees. This recommendation excludes index guarantees and has been dubbed RBC C-3 Phase II.

The Work Group presented its recommendations to the LRBCWG in December 2002 and is currently evaluating comment letters reacting to the recommendation. This article presents the current recommendations of the Work Group. Although the final requirements will probably differ somewhat from what is presented here, disseminating this information will allow a broader group of actuaries to influence the process and prepare for the eventual regulation.

Actuaries that work with annuity products may recall Phase I of this project. It uses interest rate scenarios to stress test single premium life insurance and fixed annuities, using a company's actual mix of assets and liabilities. In both phases of this project, an attempt is made to overcome the shortcomings of the factor-based approach to risk-based capital. No company's block of business is "average." Using a company's actual mix of business and running a broad range of scenarios will develop a company-specific distribution of risk exposures.

While the primary purpose of this project is to develop capital requirements, the same methodologies are appropriate for pricing and risk management of many product lines. A separate Academy group is focusing on the appropriate methodology to use for statutory reserves of equity-driven products. While there are many issues (taxes, guideline versus law, etc.) that arise only for reserves, both groups are very aware of the savings in time and effort if the respective methods can be supported by the same modeling effort. A follow-up article is planned to address the work being done by the reserve group.

It is expected that the new capital requirements will be effective for year-end 2004. New reserve requirements may be effective that soon, but will likely come later. The rest of this article will provide an overview of the recommended methodology.

GENERAL DESCRIPTION

The approach that the Work Group has recommended uses a modified conditional tail expectation (CTE) measure. Actuarial certification of results will be required. Modeling hedges is allowed if the insurer is following a clearly defined hedging strategy. It is expected that a conservative factor approach, instead of scenario analysis, will be allowed for minimum guaranteed death benefit (MGDB) blocks.

WHAT PRODUCTS ARE COVERED?

The focus of this project has been on variable annuity products. This is due primarily to the non-diversifiable nature of equity risk when combined with death benefit and living benefit guarantees common to these products. For example, an MGDB option might guarantee a death benefit that accumulates (or rolls up)

the initial premium at 5 percent per year. With negative results for the most recent three consecutive years in most equity markets, current net amounts at risk might forecast a significant probability of large future losses at some companies. The Work Group's goal is to better recognize that risk and provide an early warning.

While equity-indexed products are outside the scope of this recommendation, the Work Group recommendation initially included variable life products if doing so would increase RBC. The reserve work group, however, is not currently considering variable life products, and additional discussions to maintain consistency are ongoing.

SCENARIOS

Companies are encouraged to use their own models to generate fund returns, but must calibrate to assumptions based on historical returns. Using pre-determined historical periods to define calibration points will allow proprietary models while maintaining comparability between companies. Much of the work so far has used Regime Switching Log Normal (RSLN) models. An RSLN model developed by Dr. Mary Hardy, ASA, FIA at the University of Waterloo is available for educational purposes on the SOA Web site at *www.soa.org/research/ rsemw.html*. These models assume that, most of the time, equity returns follow a distribution that can be described as stable, with moderate volatility. However, in order to describe the reality of a fat tail, an unstable, high-volatility distribution is needed. From period to period, the model jumps from one regime to the other using a Markov process. Two-regime versions of these models describe the major American and Canadian equity indices quite well.

REQUIRED CAPITAL

The RBC requirement recommended is the 90 CTE (modified) value plus the starting value of the tested liabilities, minus the reserve held. For each scenario, the greatest present value of the negative statutory surplus at all future

calendar year-ends during the projection period is calculated for the entire book of covered business. Results for all scenarios are then sorted for use in the modified CTE methodology.

The recommendation combines these results with the common stock component (C-1cs) of the RBC covariance formula.

MODIFIED CTE METHODOLOGY

While the modified CTE measure is new to many actuaries, the jump is a short one if distributions of results have been used in the past for analysis. It helps to consider an example. Take a distribution of 100 scenarios where the sorted results range from –3 to 96, with each incremental result one higher than the one previous. (Think of it as a series from 1 to 100 with each scenario result being four less than the corresponding scenario number, or y=x-4.) Let's assume the tail we are interested in is the worst 10 percent; in this case, the worst 10 scenarios. This is how CTE 90 and modified CTE 90 are defined. In this example

the worst 10 results are -3, -2, -1, 0,…,6. The CTE 90 result is the average of all these results, or +1.5 (15/10). In the modified CTE 90 methodology, any positive results are counted as 0, so the result is -0.6 (-6/10). You would hold 0.6 units beyond the starting value of the tested liabilities to calculate required assets (statutory reserves plus capital). This method allows a separate result generated from the same distribution of results (e.g., modified CTE 60) to define statutory reserves.

ASSUMPTIONS

Discussion continues regarding the use of prudent best-estimate assumptions. The modified CTE methodology provides a basis for determining conservatism that is not available today in point estimate reserves. This will require a paradigm shift for many practitioners. Depending on the combination of policy features being valued and the degree of in-the-moneyness at the valuation date, a conservative assumption (e.g., lapses) might be higher or lower than the best estimate. Best-estimate assumptions should be used in the models. However, when the direction of conservatism is known and actual experience is not credible, the actuary should lean toward conservatism.

TERMINOLOGY

Several terms in the recommendation might be new to the practicing actuary. A glossary is included in the Work Group's paper, but here is a head start, using examples to define the terms.

- Gross wealth ratio—Using a five-year horizon, if the gross wealth ratio is 1.10, then the fund has grown by 10 percent over the five-year period (before expenses). Similarly, a 0.6 ratio means that the fund is now worth 60 percent of its original value. A ratio of 1.0 means the value at the

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end of five years is the same as it was at the beginning. It does not mean there have been no fluctuations along the way.

- MGDB (minimum guaranteed death benefit)—If a product guarantees a death benefit that could be larger than the surrender value due to fund performance, then the contract features an MGDB.

- VAGLB (variable annuity guaranteed living benefit)—This product feature guarantees a minimum surrender value, maturity value or income benefit at specified election dates while the policyholder is living.

OTHER SOURCES OF INFORMATION

The Work Group's recommendation can be found at *www.actuary.org/pdf/life/rbc_16dec02.pdf*. The Canadian Institute of Actuaries (CIA) published a paper that provides a good methodology resource. It reports the work of the CIA Task Force on Segregated Fund Investment Guarantees and is available as one of the appendices to the above paper.

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