Article from:

Risk Management Newsletter

March 2006 – Issue No. 7

Policyholder Behavior in the Tail: Variable Annuity Guaranteed Benefits Survey Results

by James Reiskytl

The Society of Actuaries' Risk Management Task Force is trying to develop better estimates of policyholder behavior in the tail (PBITT). Our mission is to examine and ultimately give guidance to actuaries on how to set policyholder assumptions in extreme scenarios. We are most interested in the assumptions used by companies or consultants for the scenarios in the 90 CTE calculations if stochastically modeled, or the assumptions for events that occur above two standard deviations of expected experience. Our first effort was an SOA questionnaire that confidentially gathered the range of assumptions actuaries use in pricing, reserving, and risk management of minimum guarantees on Variable Annuity (VA) products:

- Guaranteed Minimum Death Benefit (GMDB): guarantees minimum account value at death.
- Guaranteed Minimum Income Benefit (GMIB): guarantees minimum monthly in come at annuitization.
- Guaranteed Minimum Withdrawal Benefit (GMWB): guarantees a minimum stream of income, provided it is withdrawn within specified limits over time.
- Guaranteed Minimum Accumulation Benefit (GMAB): guarantees minimum account value at a specified future date.

The survey is available on the SOA risk management Web site *http://www.soa.org/ccm/content/areas-of-practice/finance/research/policyholder-behavior-in-the-tail-survey-results/*. The questions that were asked in the questionnaire include:

1. The profile of the companies.
2. What equity tail scenarios are assumed?
3. How the companies model the lapse and their utilization functions?
4. The lapse rates in the tail.

In this article, we provide an excerpt of our survey results on GMIB and hopefully thereby encourage readers to review our full summary report for greater details.

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1. The Profile of the Companies

The following table gives the profile of the participating companies (in millions) that issue GMIB:

	Net Premiums	Account Value	Guaranteed Value
Average	1,373	2,439	3,447
25th Percentile	306	300	521
75th Percentile	1,339	3,252	5,406

2. The Assumed Equity Tail Scenarios

Due to the proliferation of guaranteed minimum death benefits and guaranteed living benefit, a tail scenario is most likely one with poor equity markets. However, depending on the type of guarantees sold, a tail scenario for company A may not necessarily be a tail scenario for company B. For example, a company with substantial ratchet guarantees may be most hurt by a rapidly rising scenario followed by a crash, but a company with mostly return of premium guarantees will not be badly hurt by such a scenario. The wide variation in style of in-force business may explain the wide array in responses to this question, as demonstrated in Exhibit 1 on page 33.

3. Description of Lapses and Utilization Functions

It was responded that *69 percent (11 out of 16) use dynamic utilization for GMIBs:*

- Of the 10 that described their function, 40 percent (4 out of 10) explicitly stated that dynamic utilization is a function of in-the-moneyness and attained age.
- The remainder only refers to in-the-moneyness as a factor for determining dynamic utilization.
- One carrier considers the option value of exercising the GMIB versus the option

value of holding onto the variable annuity in addition to considering in-the-moneyness and attained age.

4. Lapse Rates in the Tail

Carriers were then asked to list their lapse rates in the tail scenario they described at the beginning of the survey under four different benefits (GMDB, GMAB, GMIB, GMWB). The carriers with the highest and lowest overall lapse rates, along with the average across the carriers, are highlighted as shown in Exhibit 2 for GMIB.

It is our hope that the results of this survey will enhance the actuary's ability to set assumptions for these products in extreme scenarios. They may also provide a basis for further discussion of what may become current practices.

For our future activities, we plan to report the difference in RBC results using these assumptions for a modeled block of business at an upcoming SOA Investment Symposium to try to provide a possible measure of these reported results.

We also plan to do this survey again this year. Hopefully the next report will include company responses for the new VA RBC Component Requirements for December 31, 2005. Our next survey will address lapses assumed on Universal Life products with secondary guarantees in the tails.

We greatly appreciate the time and efforts of those who responded. We encourage and welcome comments, questions and suggestions from all of you. Please send them to either James Reiskytl at *jimreiskytl@wi.rr.com*, chair of the Policyholder Behavior in the Tail Working Group or Steven Siegel at *ssiegel@soa.org*. ✦

Exhibit 1: Tail Scenario Given by Respondents

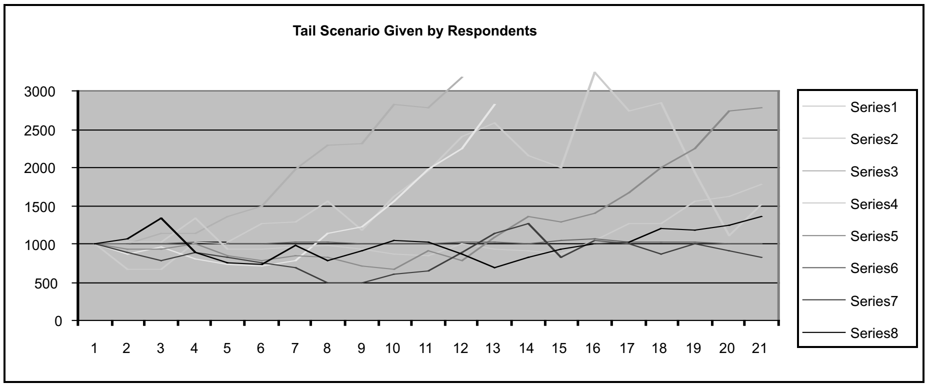

Exhibit 2: Lapse Rates for GMIBs