



Insights and Commentary on the Reinsurance and Insurance Markets
from Ruark Consulting LLC and Ruark Insurance Advisors, Inc.

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Famous or Not So Famous Quote:

Get your facts first, and then you can distort them as much as you please. Mark Twain

GMDB Lapse Experience

By Inger Harrington, FSA



Predicting the decisions variable annuity (VA) owners will make is difficult for actuaries involved in pricing, reserving, and risk management.

Should I make a withdrawal? Should I re-allocate my funds? Should I surrender my policy? Should I annuitize?

These decisions have always had an impact on the pricing and valuation of variable annuities but with the proliferation of guaranteed minimum benefits, their impact is greatly magnified. Exercising some guaranteed benefit options can be timed by the owner to maximize the financial value to them. The mere presence of a guaranteed benefit can cause owners to invest more aggressively. Some guaranteed benefits that are

Continued on page 5

What's New in RCL's Dental Practice?

By Ruth Ann Woodley, FSA



The first half of 2006 has been busy for the dental consulting practice (a.k.a. "me"). In June, I sent out results for the RCL 2005 DPPO Network Study. This update of the discount study first performed last year used calendar year 2005 claim data (hence the title) and included some valuable enhancements. The study was expanded to include several new participating companies that are key national and regional players. Also, I worked with The Ignition Group, a company that collects provider network data and provides tools to show companies how their networks compare to the competition, to include much more accurate and consistent network size data, and was able to provide network counts based on unique dentists, unique office locations, and total access points displayed in a company's directory.

Continued on page 2

Capital-Efficient Design Considerations

By Peter Gourley, FSA



Earlier this summer, I had the opportunity to present in Las Vegas at the SOA seminar on principles-based valuation and its impact on the product development actuary. I'll share the contents of my talk with you in this article; I guess not everything that happens in Vegas stays in Vegas.

Why is capital efficiency important in variable annuity pricing?

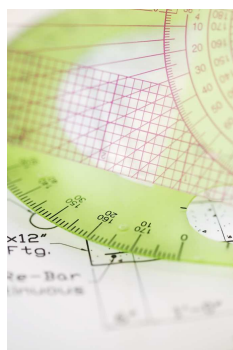
Let's begin with a little VA pricing history. In the old days (as in the 20th century), variable annuities were sold primarily on the breadth and quality of the selection of underlying funds, rather than on guaranteed benefits. This was not an inherently risky product. Pricing was often done using a single deterministic scenario with some sensitivity testing (perhaps a higher market increase or a decrease to gauge the risk of not covering fixed expenses). Pricing was done on a return on capital approach, with capital defined as a few percentage points over the cash surrender value.

Continued on page 2

RCL Dental - from page 1

The most exciting change was the addition of out-of-network claims and related discounts. Along with the same in-network discount information published in the last study, the new data made it possible to publish the overall discount each company achieved across all claims both in- and out-of-network, often referred to as the effective discount. I published two versions of the effective discount: one based on the actual amount paid for each out-of-network claim, and another that assumed a flat 0% discount out-of-network. Including the second version essentially normalized for varying claim limits used out-of-network and allowed participants to compare their results across companies which may have chosen different strategies for setting those limits. The new effective discount results represent a big improvement to the study, since they allow companies to look at their total competitive cost position and whether they are achieving the optimal mix of network breadth versus depth.

I will also be doing some analysis of overall results and requested special projects.



For example, which factor seems to be more important to achieving high effective discounts – having high in-network discounts or having a large network? Does a larger network size always increase in-network utilization, or are there other factors at work? Based on originally submitted charges, do in-network dentists tend to be just those who already charge lower fees?

I will be looking at claims for companies who participated in both the 2004 and 2005 studies to see if it is possible to estimate the average annual in-network fee increase. And I will be reviewing whether there are any material differences in per member utilization by company – either overall or for procedures that may indicate varying practices for applying alternate benefit limits to procedures like white fillings on rear teeth or crowns from high noble metal.

Meanwhile, I am working on other ideas to expand RCL's dental consulting practice, particularly in providing more competitive information to the industry. One promising idea is to use information from carriers' rate filings to help companies understand how they differ in their pricing of various benefit options, geographic regions, industries, etc. This information can be used to determine where companies need to

delve deeper into their pricing studies and where their own competitive strengths and weaknesses lie. Of course I'll also be performing updates to past studies in 2007, revisiting the ASO fee survey started this year and considering a repeat or "mini-update" of the DPPO discount study if there is sufficient interest. As always, I would love to hear any suggestions on information you would like to have, so please contact me with your ideas!

Capital-Efficient Design—from page 1

Guaranteed benefits were mainly return of premium or multi-year ratchet GMDBs. Since there was no true optionality, there was little concern over contractholder behavior. As the deterministic scenario would never produce death claims, the pricing actuary might haircut the GMDB rider charge for expected claims over a broader range of outcomes so as to not take the full charge into revenues, but there would be no capital effect of the guaranteed benefit.

More recently, roiling equity markets forced recognition of the volatility of returns. This pointed toward stochastic modeling to capture a wider range of results. At the same time, companies sought to achieve differentiation of their products through a proliferation of guaranteed benefits. This occurred both within benefits (as GMDBs became richer with annual ratchets, roll-ups, and combination benefits) and with the introduction of new benefits (GMABs to GMIBs to GMWBs). These living benefits came with true optionality for their purchasers. As a result, the potential cost of guaranteed benefits became much less remote. Pricing for VAs became more complex, but not (yet) capital-intensive. However, these same two developments of volatility and richer guaranteed benefits (GBs) motivated changes to the capital approach.



Now, there is explicit recognition of tail risk in regulatory risk-based capital. In many companies, this was already the practice in internal risk management measures. With statutory reserves also proposed to follow this approach, regulatory GB claims will be even closer to those on a realistic expected basis. That there is now a much better link between genuine risk and capital employed is a bright side. Despite the complexity of this approach

Continued on page 3

Capital-Efficient Design—from page 2

and its accompanying implementation pain, it's important to remember that it's a better world (for those who prefer order and justice, at least). The pricing actuary now needs to be cognizant of the denominator as well as the numerator of Return/Capital in order to achieve target returns.

Paths to capital efficiency

When considering ways to be efficient with capital, the pricing actuary should recognize that product features (particularly guarantees) are what drive capital requirements and that there is generally a good connection between actions that reduce GB cost on a realistic basis and the resulting capital levels. But not always.

There are two paths to capital efficiency. These are sequential, rather than mutually exclusive. One path is to tailor product features in the design phase to reduce the value of contractholder options. The key to this path is to have the reduction in value as measured by customers be less than the reduction as measured by regulators, rating agencies, or Corporate. This requires knowing your customer (and perhaps knowing your regulator and corporate actuary). This path is constrained by competitive need (practically, your benefits can't be worse on their face than your target competitors') and by market conduct issues (these could crop up if your real reduction in value is dependent on fine print in the contract).



The second path is, given a set of product features, to take post-design actions. The pricing actuary might need to assume that these will be in place by product launch in order for the pricing to work, since the actions often will not be implemented during the design phase.

Product features

There are several ways to influence capital levels through product features:

- **Waiting periods:** examples of waiting periods before guarantees can be exercised include the typical 10-year period on GMIBs and the offer, accompanied

with some type of bonus, to defer taking withdrawals on GMWBs. These are both good cases of achieving a reduction in customer value less than the reduction measured by capital requirements. In the case of the GMIB, the contractholder was likely not planning to annuitize until a later age anyway. With the GMWB, the deferral is viewed as a valuable exchange.

Waiting periods are effective in reducing capital requirements due to the power of present value (later duration claims are discounted with interest), the power of persistency (the effect of mortality and lapse means fewer contractholders around to cash in GBs), and the fact that an up equity market is more likely with a longer time period (for example, the AAA pre-packaged equity scenarios used in C-3 Phase II RBC work suggest that the probability of a market decrease over one year is 29%, while the probability over 10 years is only 12%). As most GBs are put-based, they are more likely to be worth less in future when assuming a market with a positive mean.

Generally, waiting periods perform well in the goal of customer value < capital requirement since the benefit doesn't go away (and may even increase with ratchets and rollups).

The key is to have the reduction in value as measured by customers be less than the reduction as measured by regulators, rating agencies, or Corporate.

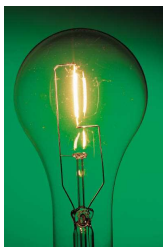
- **Limits:** guaranteed benefits could have limits around the age of the insured life (for example, a GMDB could revert to account value at an advanced age; this is understandably viewed as a take-away when the benefit is most valuable), the benefit amount (such as being subject to a maximum of a percentage of premium), or the time when the benefit can be exercised (such as to certain ages or durations for a certain number of days around the contract anniversary). Such windows have two risk management/capital reduction benefits: some contractholders will neglect to exercise even a valuable benefit during the limited period; and GB claims aren't heaped at one time, due to the spread of issue dates and so exercise dates.
- **Asset allocation:** limiting allocation to riskier funds or mandating certain allocation strategies decreases volatility of returns and therefore risk.

Continued on page 4

Capital-Efficient Design—from page 3

An alternative to this is to have no investment limitations but have the GBs apply only to certain types of funds (for example, no roll-up of the guaranteed amount on account value in fixed or money market funds). It should be noted that decreasing volatility also decreases expected return. This could then be an issue with roll-up GBs, as it becomes harder for the account value to keep up under conservative return assumptions mandated for capital purposes.

Post-design actions



Ideas to reduce capital strain once product features are designed include:

- **Reinsurance:** reinsurance is the best approach to precise tailoring to the specifics of your product. A catastrophe cover can focus on tail risk which both makes the coverage more affordable and directly affects the scenarios driving capital requirements. Reinsurance availability is a constraint, but proper design of the product’s guarantees, as above, can improve the likelihood of obtaining coverage. Put differently, the risk/capital reduction measures mentioned in the previous section will be present in any reinsurance cover – regardless of whether they’re present in the retail product design!
- **Capital markets:** capital market solutions to GB risk have seen improving availability and expertise over the past few years, though not necessarily improving cost. Having a hedge program in place involves high maintenance and could still be imperfect (especially for GMDB risk), as the program requires a specific assumption on contractholder utilization. There are some disjoints between the economic and capital effects of this approach. The actuary will likely need to assume something less than 100% effectiveness for stochastic capital modeling – and quite a bit less for the deterministic approach under the RBC standard scenario.
- **Internal hedging:** the aggregate risk within an entity could be less than the sum of its parts’ risks by lining up natural offsets across different lines of business. For example, VA and equity-indexed annuity guarantee risks move in opposite directions for changes in the equity market. Alas, this reduction in risk is merely real, as no such offset is allowed by regulatory calculations.

However, as some companies have pricing standards based on internal formulas and take an enterprise-wide view of risk, some VA pricing actuaries can take advantage of this idea.

Real world effectiveness

It is not always the case that these measures reduce capital (which is based on someone else’s view of risk) as much as they reduce real world risk (that is, your view). The disjoint arises because of differences between realistic pricing assumptions and those allowed or mandated for regulatory capital. The standard scenario is the current extreme example, with assumptions around perfect contractholder knowledge, conservatively high GMIB exercise and GMDB mortality rates, and conservatively low lapse rates.



How do the approaches above perform in this category of effectiveness?

- **Waiting periods:** Powerful in reducing real world risk; the reduction in capital might be proportionately less due to more conservative discount factors (lower interest and higher persistency for capital calculations).
- **Limits:** Have generally equally applicable effects, since contractual provisions are reflected in capital modeling.
- **Asset allocation:** Effective in the real world and in capital levels, although any reduction in expected return accompanying the reduced volatility could cause a problem with roll-up benefits.
- **Reinsurance:** Generally equally applicable effects, though watch out for treaty claim limits, which are more likely to crop up in tail scenarios.
- **Capital markets:** Some real/capital disjoints are likely.
- **Internal hedging:** If looking at statutory capital, total disjoint is likely.

The pricing actuary will need to test these different approaches in a fully functional model in order to gauge their effectiveness. However, even then, surprising consequences are possible.

One not-overly contrived example would be a GMDB reinsurance arrangement between a direct writer

Continued on page 5

Capital-Efficient Design—*from page 4*

establishing capital via stochastic modeling and a reinsurer governed by the standard scenario for RBC. In this example, expected mortality is less than the YRT reinsurance rates (of course), but the reinsurance rates are less than the mortality mandated under the standard scenario.

The result of this reinsurance deal with genuine risk transfer is that *both* parties experience an increase in capital levels compared to those occurring with no reinsurance in place!

Conclusion

The move toward principles-based reserves and capital doesn't change the pricing dynamic of finding the sweet spot of marketable and profitable products. Instead, it adds or heightens another consideration: that design more directly influences capital and therefore profitability.

GMDB Lapse—*from page 1*

in-the-money may deter surrenders; others may increase partial withdrawals. But will they?



Actuaries rely on a combination of experience and judgment to set assumptions. The judgment component is very important with VAs because the years of experience with guaranteed minimum benefits in place is limited, but growing. RIA routinely examines the experience of VA companies for which we have brokered reinsurance treaties. In this article, we'll share some of what we've learned about lapses under VAs with guaranteed minimum death benefits (GMDB) during the first half of this decade.

Are there similarities in lapse rates across companies?

Lapse rates under variable annuities are very much company and product specific. They are strongly influenced by the commission structure and the contingent deferred sales charges (CDSC). That said, there are similarities in the pattern of lapses, if not the level. Lapse rates are low in the early years of the CDSC period and

increase gradually as the CDSC fee drops and becomes less of a financial deterrent. There is usually a surge in lapses the first year following the end of the CDSC period and then the lapses level off to a rate somewhat higher than in the year preceding the surge. For one block of business with a 6 year CDSC period, the lapse rates were in the single digits during the CDSC period. They rose to 13% in the year after the CDSC period ended and then dropped to about 10% in subsequent years. The lapse experience of another company with a 6 year CDSC period was similar but had a lapse rate of almost 21% in the year after the CDSC period ended.

How have lapse rates compared with expectations?

For GMDB, where the risk is often back-ended (mortality increases with time), a low lapse pattern is conservative because it does not potentially understate the deaths in later years. Reinsurers of the GMDB risk use these low lapse rate assumptions in setting their premium rates and we fully expected to find higher rates in our studies. Recent industry articles have described very strong VA growth but very modest VA net growth (with 1035 exchanges and other transfers excluded). This also led us to expect higher lapse rates. Instead most of our clients' business has experienced lapse rates quite close to the reinsurers' assumed levels! While there may be more than one reason for this result, we believe companies that maintain state of the art products, as our clients do, will enjoy low lapse rates at the expense of those companies that are slow to innovate.

Do lapse rates decrease with owner age?

Actuaries have to make assumptions regarding how the age of the contract owner affects the decision to lapse. A common hypothesis is that younger people are less likely to keep their contract in force in order to either avoid the surrender charge or keep the GMDB benefit in place. They have more time to recoup the CDSC charge before retirement, and they do not view the GMDB to be as valuable a benefit as older owners do. With one notable exception, we have found very little difference in the lapse rates by age. The outlier company is no longer in the VA market and their closed block experienced rates that declined significantly with



Continued on page 6

GMDB Lapse—from page 5

advancing ages over 60. We can speculate that the younger owners were more inclined to lapse (or encouraged to do so by brokers) once they learned of the company's exit from the market. This illustrates the difficulty in drawing broad conclusions from any one company's experience.

Are lapse rates lower for ITM contracts?

In setting pricing assumptions for GMDB benefits, actuaries often take the prudent position that contracts with an in-the-money (ITM) GMDB experience lower lapse rates than other contracts, based on the premise owners are reluctant to terminate a valuable benefit. It is fortuitous that during the study period the stock market experienced a significant correction/decline. (I can't believe I just wrote that sentence given the impact on my 401(k) plan!) Analysis of VA experience during this period provides valuable insights we would never have gained had the bull market continued. The decade began with the S&P 500 index at 1455. It had fallen 47% by October, 2002 and recovered about 70% of the decline by the end of 2005. For blocks of business with early issue dates, significant shortfalls between the GMDB and the account value developed on many contracts, increasing the value of the GMDB.



In our studies, we examined the lapse rates for contracts both in and out of the money, where an ITM contract is one where the GMDB exceeds the account value. Contrary to our expectations, we found the lapse rates were higher for ITM contracts! ITM lapse rates were in the single digits but exceeded OTM lapse rates by two to three percentage points. When weighted by contract sizes, the differential narrowed by one percentage point.

Do contracts heavily ITM have lower lapse rates than those modestly ITM?

We also looked at the lapse rates based on the degree to which contracts were in the money, where the degree ITM was defined as the excess of the GMDB over the account value, divided by the account value. Our hypothesis was that owners may be willing to surrender

a contract with a GMDB modestly ITM but they would be reluctant to do so with a GMDB heavily ITM. Again the results suggested otherwise. We found very little difference in lapse rates based on the degree ITM and in fact contracts most heavily ITM (70% and higher) experienced lapse rates between one and two percentage points higher than the rates on contracts ITM by less than 10%. The higher lapse rates may be attributable to the absence of the surrender charge on these contracts, as many were issued prior to 2000 and were no longer in the surrender charge period. On the other hand, these owners might have terminated even if there had still been a CDSC because they were so dissatisfied with the investment performance.



Should you change your lapse assumptions based on this experience?

While we can objectively study contract owner behavior, understanding their motivations is more subjective. The results observed indicate that owners do not focus on the value of the GMDB when making termination decisions. We can speculate that poor investment performance may be a stronger driver to lapse than the value of the death benefit is to deter lapse. However, most stochastic pricing and valuation models for GMDBs include some investment performance scenarios that are far worse than were actually encountered during our study period. Because there is no experience on how people react in extreme conditions, it is prudent to use a dynamic lapse assumption in modeling that reduces the lapse rate for older insureds as the GMDB becomes more heavily in the money.



This article has focused on one behavior and one benefit. Today many VA contracts have more than one guaranteed minimum benefit and understanding the impact and interaction of these benefits on the many contract owner decisions presents a great and interesting challenge to actuaries. RIA will continue to lead in evaluating actual experience from these multiple guarantee contracts.



- This spring, the Reinsurance Section Council of the SOA is producing a first ever seminar focused entirely on Reinsurance, aptly named **ReFocus**. It will be in Las Vegas at the Hyatt Lake Resort, on March 4-7. Tim is a section council member, and he reported that the council’s intent is for ReFocus to have a permanent place on the spring calendar. “Despite the number of existing conferences in the U.S.,” Tim reported, “there was no one venue that brought together people interested in reinsurance. ReFocus will become a necessary stop for regulators, for personnel at ceding companies, reinsurers, and rating agencies.” In addition to the networking opportunities that ReFocus provides, a full slate of sessions for beginners to experts will fill the agenda. Tim added, “there’s already plenty of interest from the international audience, and the council is also mindful that ReFocus can help build the audience for health reinsurance, which often plays second fiddle to life or annuity.” If you would like more details as they become available, send Tim a note.
- RIA and RCL once again participated in the Golf Fore the Kids tournament, supporting a cause we care deeply about – fighting childhood cancer. Two employees at our small company have loved ones battling this horrible disease right now, Sally’s son and Tim’s nephew. If you’d like to make a donation, you can do so by going directly to the website www.golfforethekids.com. This is an ongoing charity and donations at any time are greatly appreciated. If you’d like to participate in the tournament next year, let Inger know and she’ll be sure you receive timely registration information.
- RIA will be attending several conferences over the next few months and look forward to seeing you there.
Valuation Actuary Symposium -Mike
Equity Based Guarantee Conference - Rich
SOA annual meeting - Tim and Rich
- Ruth Ann will be speaking at the World Research Group’s conference “Optimizing Dental Benefits,” in San Francisco from Nov. 29 – Dec. 1. Let her know if you’re going as she may be able to get discount coupons.
- Ruth Ann will also be attending the National Association of Dental Plans (NADP) Annual Conference in Denver, September 27-29. She has also joined the NADP’s CDT Technical Advisory Group, and will be working on the 2009 CDT codes.

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