

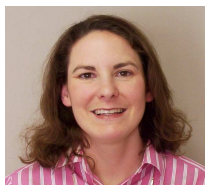


Insights and Commentary on the Reinsurance and Insurance Markets
from Ruark Consulting LLC and Ruark Insurance Advisors, Inc.

October, 2005

Famous or Not So Famous Quote:

Could it be that all those trick-or-treaters wearing sheets aren't going as ghosts, but as mattresses?
 -George Carlin



First Ever Dental PPO Network Survey

by Ruth Ann Woodley, FSA

On July 1, RCL distributed results for our first Dental PPO Network Survey, and I breathed a big sigh of relief! The survey represents a major landmark for Ruark Consulting, and also for the dental insurance industry. It is the first study ever done comparing dental PPO in-network discounts across the industry, and because most of the country's largest carriers participated it provides a broad picture of the market. And it used actual paid claim data, rather than just sample fee schedules, to get the most accurate results possible. The data was used to determine each carrier's contracted fee amounts by procedure code, and these were then compared to the average charges of all dentists within the geographic market. The survey also collected data on each company's network size,

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C3 Phase II Practical Insights for this Year-End

By Timothy J. Ruark, FSA



Editor's Note: This is an advance copy of the article that will appear in the December issue of the SOA's Financial Reporter. As most of you know, RIA designs, places, and administers reinsurance treaties for variable annuity guarantees. Our work naturally extends to providing valuation peer review for our clients. The insights provided were gleaned from these reviews. Tim wishes to acknowledge the significant contributions made by Michael Loftus, Peter Gourley, and Inger Harrington in the modeling and preparation of this article.

Implementation of C3 Phase II is happening now. Compliance with the regulations will be time consuming, especially initially. Results from the valuation will likely be very different from the outcome from existing regulations, as C3 Phase II is

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C3 Phase II Forum

Do you have a question you just can't find the answer to? Are you having trouble interpreting the guidelines? Are others having the same problem?

If you'd like to be part of the forum, contact Peter Gourley at peter@ruarkonline.com or (860) 651-3746. Here's how it will work: Pose your question to Peter. We will investigate by talking with other companies and/or regulators, while keeping your identity confidential. Our findings will then be shared with you and all other forum members.

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contracting and network management practices and some product details.

Participants were able to see how their discount results in total and by procedure categories compared to market averages, and to specific (unidentified) competitors. They received similar information on the network size results, and a summary of the network management practices surveyed.

Companies have been able to make use of this information in several ways. They've compared their position in specific areas to their prior expectations and contracting targets to determine whether they should revise their goals to be more or less aggressive. Some companies found their competitive position to be very different from prior expectations, and have made significant updates to their network development strategy. Others validated overall expectations but used the data to refine specific targets or to validate specific requests for changes. And in some cases, a better understanding of their competitive position even led to new thinking about how to adjust the company's product strategy to take the best advantage of their strengths.

One surprising result was that large networks are not necessarily tied to small discounts...

With all of this data on hand, RCL was able to test what patterns exist and how the results for different components are related. One surprising result was that large networks are not necessarily tied to small discounts, and vice versa. It appears that the companies with the most membership in a given location are usually able to leverage that to produce larger networks and deeper discounts than their smaller competitors.

We also studied whether discounts were consistent

by class and for high visibility codes like crowns, and whether these patterns were different for the companies with the highest discounts/largest networks from those with average or lower results.

Less surprising was the range of methods for listing dentists in member directories and counting network size, especially for very large practices. Some companies place a strict limit on the number of offices they will list for a given dentist; others follow the practice's instructions, which may mean listing each dentist in many different offices to reflect their frequent movement.



The variety of answers (both extremes and points in between) reflects the industry's struggle to develop standard counting practices.

Feedback on some other areas showed consistency – for example, most companies review fee schedules annually, and most contract with specialists at different rates from general dentists. There is a lot of talk of using “MAC” (Maximum Allowable Charges) plans, which reimburse only up to the PPO fees out of network, but while most companies have this option in their product portfolio very few sell it as their standard design.

RCL also used the information to help participants identify areas where they are particularly strong or weak, especially when other factors like the company's membership level are not consistent with their network size and discount results. In one instance, a company knew that they had low discounts in one area where they were aggressively adding new networks dentists. But our results showed that their competitors were able to grow large networks with lower fees, and this company could revise their plans to get to a better size and discount combination.

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Perhaps the most valuable benefit of the survey was that it allowed participants to do something that is near and dear to every actuary's heart – substitute facts for impressions. Every company at some point hears that it pays dentists the lowest fees, or has the smallest network, or is the only one not pushing a particular product. But having independent, consistently developed facts on hand frees you to focus on the most important issues without being distracted every time someone yells "Fire!"

Editor's Note: 2005 Dental PPO Survey

Ruth Ann will conduct another survey using actual 2005 claims to develop both in network only discounts and effective discounts across all claims (in and out of network). If you are interested in participating, please contact Ruth Ann before December at ruthann@ruarkonline.com or (860) 651-6236.

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designed to capture greater risk detail than its predecessor regulations. This article will describe practical considerations gleaned from actual valua-

C3 Phase II is complex and involved, with many moving parts

tion calculations recently performed by our firm. In implementing C3 Phase II there are a number of complications that must be dealt with. These include the myriad reinsurance treaties that must be accurately reflected in the calculations, coordinating contract specific and aggregate treaty limitations. Efforts are further complicated by uncertainty related to the exact meaning of the regulations in a few key areas. But despite the complexities, actuaries need to be decisive, because C3 Phase II requires an answer, not a range and certainly not excuses.

Today's Valuation Results

We evaluated 11,000 annuity contracts written from a single, representative insurer (denoted "ABC") over the last few years. All the contracts include both a Guaranteed Minimum Death Benefit (GMDB) and a Guaranteed Minimum Income Benefit (GMIB) and are covered by a reinsurance treaty. As of the valuation date, the aggregate account value for the contracts is \$1 billion. Since most of the contracts were sold after the stock market declined, and the stock market has been relatively stable of late, most of these contracts have account values that are reasonably close to their guaranteed values.

Today, before the new regulations take effect, the assets required to back ABC's block of business are \$10.9 million in excess of the basic reserve, after consideration of reinsurance. This figure is allocated as follows:

Total Asset Requirements (TAR), in \$ millions

<u>Regulation</u>	<u>Before Re</u>	<u>After Re</u>
GL34	\$0.1	\$0.6
GL39	\$4.1	\$0.3
<u>RBC</u>	<u>\$10.0</u>	<u>\$10.0</u>
TAR	\$14.2	\$10.9

The reinsurance effect due to Actuarial Guideline 34 (GL34) is a small negative credit, primarily because the GMDB treaty is a stop loss treaty. While the single scenario GL34 is not a favorable scenario, it features high account value recovery rates, and the modeling tends not to produce aggregate claims in excess of the aggregate deductible. Because the stop loss treaty carries a relatively small premium, the impact of reinsurance on valuation results is modest.

Actuarial Guideline 39 (GL39) results are not surprising, since the reinsurance treaty is a first-dollar arrangement. Both the ceding company and the reinsurer are holding a reserve equivalent to their

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separate collections for the guaranteed benefit.

The total asset requirement includes not only the reserves but also risk based capital. RBC equals 1% of account value (as a proxy for reserves).

C3 Phase II Valuation Results

C3 Phase II requires modeling of accumulated cash flows over a large number of stochastic return scenarios under prudent best estimate assumptions



to establish RBC. The modeling compares revenue (contract charges such as M&Es and rider fees) against expenses and claims, accumulating and then discounting these by

duration from the valuation date.

The by-duration results are then summed across contracts and the Greatest Present Value (GPV) of cumulative losses is selected for that scenario. The total asset requirement is then the average of the worst 10% of the GPVs (CTE 90) less statutory reserves. The stochastic result is subject to a floor produced by running a single Standard Scenario with mandated conservative assumptions.

The stochastic modeling under C3 Phase II will require assets of about \$1.5 million in excess of the basic reserve to back ABC's business, after reinsurance. The Standard Scenario was also calculated and for this block produced a substantially higher result, meaning that the TAR would be based on the Standard Scenario. The somewhat startling results are shown below, with observations following:

Total Asset Requirements, in \$ millions

<u>Regulation</u>	<u>Before Re</u>	<u>After Re</u>
CTE90	\$(2.8)	\$1.5
Standard	\$81.5	\$23.3

Observations – Asset Requirements



Under existing regulations, \$10.9 million or a little over 1% of assets is set aside to protect against contingencies. The bulk of this amount is the 1% of reserves that is established for RBC.

Of course the 1% factor is very rudimentary, since it does not reflect any of the guarantees' risk factors, and it actually produces a lower dollar amount as the account value decreases! The new regulations more than double the insurer's asset requirement to \$23.3 million, or 2.3% of account value.

It is really the efficacy of the reinsurance treaties that provides the relief to the insurer. While the GMDB stop-loss treaty does not have much effect (few claims emerge from a block that is generally out of the money and which has an annual ratchet or return of premium death benefit), the GMIB treaty continues to be efficient in shifting the claim obligation to the reinsurer. Without that treaty, the Standard Scenario asset requirement would triple. The treaty is effective because the insurer's claim recoveries exactly match the retail claims (with the exception of an aggregate claim cap - more on that later). In exchange for these claim recoveries, the reinsurer receives the bulk of the retail fees for the guarantee, with a modest ceding commission accruing to the insurer. The guaranteed living benefit becomes a much smaller factor in the calculations.

...the GMIB treaty continues to be efficient in shifting the claim obligation to the reinsurer.

Note the dramatic differences between the CTE90 and Standard Scenario results. The Standard Scenario is characterized by an immediate account value drop, with very little recovery in future years, along with conservative lapse, margin, and benefit election assumptions. With ABC's GMIB rolling

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up each year and account values failing to keep up, the Standard Scenario worst PV of loss occurs in later durations, driven by GMIB claims. Many of these are absorbed by the reinsurer, although claim levels are high enough to exceed the treaty's aggregate cap.

Company ABC also has a large block of contracts with GMDB but no GMIB. This block was not included in our analysis, yet all variable annuities should be consolidated for these calculations. In the case of ABC, the inclusion of this additional block would reduce ABC's TAR significantly. This occurs because the GMDB is a maximum anniversary value design and under the Standard Scenario, the net amount at risk decreases over time and after a few years disappears. Since ABC's TAR is driven by GMIB claims at very late durations, the contribution of the GMDB-only block to the GPV calculation at these late durations is dominated by the accumulated fees rather than the GMDB claims. While for company ABC the inclusion of the GMDB-only block does not cause the CTE90 result from the stochastic modeling to exceed the Standard Scenario result, this might have happened. The actuary should reflect all variable annuity contracts in determining which method produces the highest value.

The CTE90 result comes principally from early durations, when a short surrender charge period on the most popular product wears off and a large jump in cash surrender value (CSV) must be funded. As this jump is most pronounced in scenarios with robust account value performance, we find that the down scenarios that produce high levels of guaranteed benefit claims in later years tend to be the best results! The ability in those scenarios to accumulate product margins over many years provides a sufficient offset to the claims, at least in comparison to the early CSV increase.

...an insurer that fails to reinsure or hedge ... is exposed to huge asset requirements in the future...

As a further example of surprises that could pop out with C3 Phase II, the CTE90 result before reinsurance is better than after reinsurance (interpret the negative TAR as implying that assets less than the basic reserve are required, although this would be floored at zero in practice). This occurs because the removal of the reinsurance premium is more beneficial to the early durations driving the CTE90 level than removal of the reinsurance recoveries, which are back-ended due to the GMIB waiting period.



Although the insurer is shielded somewhat from the impact of RBC due to the reinsurance treaty, it is interesting to note that an insurer that fails to

reinsure or hedge would not only experience a large increase in asset requirement under C3 Phase II, but also is exposed to huge asset requirements in the

future, especially if the account values underperform. With a GMIB, the insurer typically has a ten year wait before a claim can occur, and this allows the contract's margins to accumulate without hindrance. As the insurer draws closer to the end of this waiting period, margins have less time to accumulate, and as the first exercise date draws nearer, the impact of discounting is lessened. This leaves the insurer in a vulnerable position, unless account values have performed strongly. Since today's hottest rider, the GMWB, has no explicit waiting period, the insurers of that product must either have accommodating reinsurers, aggressive assumptions, or strong constitutions.

Observations – Reinsurance Treaties



Although ABC's valuation shows an RBC savings of nearly \$60 million due to reinsurance, the savings could be

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greater. Again, the treaty's risk transfer is complete, except for an aggregate claim limit. However, the treaty predates the adoption of C3 Phase II, and in particular, the Standard Scenario was not contemplated by the insurer and reinsurer on the treaty's effective date. So, the treaty's aggregate claim limit needs to be larger. Economically, the treaty terms are appropriate as is, but the Standard Scenario promulgates a lapse assumption over the next 40 years that is unusually low. Consequently, there are far more contracts in force in later durations than anticipated. Many treaties have provisions that allow for a reasonable response to regulatory changes, and ABC will likely want to amend the treaty for C3 Phase II.

...even where the aggregate claim cap is exceeded, ...it will often have no impact on CTE90.

Many insurers incorporate a range of reinsurance treaties, with varied terms and effective dates, into their calculations. With a few exceptions, almost all of these treaties contain non-proportional limits that must be reflected in the valuation. Claim limits usually do not have a major impact on CTE90 calculations, because claim limits are typically designed to provide reinsurance recoveries under very poor scenarios (like the Great Depression). Even if a claim limit is exceeded in one of the scenarios, it may have little or no impact on reserve calculations. For example, if a GMDB treaty had an aggregate claim limit of \$10 million, and the worst scenario produced claims of \$12 million, then this treaty has a \$2 million shortfall. However, if a CTE90 calculation is performed on 1,000 scenarios, then the impact of this one shortfall scenario is low, because it is averaged with 99 other scenarios.

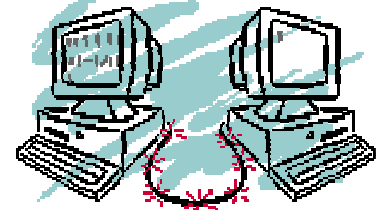
It is interesting that even in scenarios where the aggregate claim cap is exceeded, and directly reflected in the calculations, it will often have no impact on CTE90. This is due to the timing of the

cash flows. Remember, GMIB claims are back ended because of the waiting period, and a reinsurance claim cap is further back ended since the reinsurer typically will pay millions of claims over many years before a claim cap is reached. So, claims that exceed the cap may occur beyond year 20. But 20 years of margins from all contracts are available to defray the excess claim cost on the subset of contracts that persist, and often these accumulated margins overwhelm any residual claims. Of course, as seen with ABC, calculations of the Standard Scenario are quite different, not only due to lapse rates, but also due to the modest recognition of fee income.

Another common element in a reinsurance treaty is a deductible. If a treaty has an aggregate deductible, then the modeling must capture aggregate statistics to assess the deductible. A treaty with a deductible will not transfer as many claims to the reinsurer as a 1st dollar treaty, however, at the CTE90 level, there may be little practical difference between recoveries under a stop loss treaty and 1st dollar treaty. Under the worst 10% of scenarios, the reinsurer is paying the bulk of the claims. Thus, as account values underperform the guarantee, the ceding company can expect the benefit from reinsurance in the calculation to increase in parallel with the increase in TAR without reinsurance, as a greater portion of scenarios produce claims that exceed the deductible.

Techniques We Followed

Modeling - Our company has always focused on design and pricing of reinsurance programs, using sophisticated



stochastic models, written in common desktop software, that are robust enough to handle all the varieties and nuances of VA guarantees. Because sharing of reserves and capital is such an important part of reinsurance treaties, we chose to modify

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our existing models for this valuation work, rather than rely on a separate calculation system. This ensures that the same model that has successfully analyzed the impact of reinsurance cash flows, will also produce the valuation impact on a consistent basis. As you move into unfamiliar areas, it's helpful to have a familiar model to guide your steps.



Census Grouping - Despite the advances in computer technology, we estimate that to run 1,000 scenarios for 50,000 annuity contracts requires 120 hours on our best computer! This is only an estimate, because we would have fired any actuary that actually wasted that much time. Our actual approach is to create a grouped seriatim census, by combining contracts that have so much in common that any differences in calculations will be negligible. In particular, we grouped ABC's 11,000 contracts by:

- Position of the guarantee relative to AV (in-the-moneyness)
- Attained Age
- Sex
- Contract Duration
- Benefit Duration (needed where optional benefit can be added after issue)
- Benefit Design
- Plan Design

While there is a very large number of potential permutations (almost 90,000), fortunately most of the permutations were not actually populated by contracts and the grouped census for ABC numbered only 1,200. By grouping the census, the computer run time was drastically reduced from 28 hours to 3! We use the grouped census whenever there is stochastic modeling to be done, but before doing so, we perform tests to ensure the accuracy of the grouping. We run both the seriatim and grouped

data through several deterministic scenarios. If the results for the grouped census are not within 2% of the results for the seriatim census, we re-group (literally). As part of the regrouping we identify outlier contracts, those with both very high net amounts at risk and very high percentages in the money. The outliers are treated on a seriatim basis while the other contracts are grouped. Once we get a grouped census that is within 2%, we use this revised grouped census for the stochastic modeling. But we also retain the relationship between the grouped census and the seriatim census under the deterministic results (e.g. grouped = 0.99 x seriatim), and we apply that same factor to the results under the stochastic modeling (e.g. final results = grouped /0.99).

Interpretation of Guidelines— As carefully as the guidelines are written, there are areas subject to different interpretations. Even areas that seem extremely clear to one person can be interpreted in unexpected ways by others. The Standard Scenario promulgates many assumptions for the calculations, although we think there is still some uncertainty here. For example, the guideline states that a lower lapse rate should be used when an elective living benefit is in the money (7% if barely ITM versus 2% if 20% or more ITM). We interpret this to mean apply the lower lapse assumption if any durations are more ITM. That is, we interpret the “ITM-ness” to use the worst ITM result across all durations rather than to be a duration by duration determination. However, the opposite interpretation is reasonable from a literal reading of the instructions.

Scenarios - We use 1,000 scenarios for valuation work. All our scenarios are taken from the American Academy of Actuaries prepackaged returns for ease of use. Because the stochastic calculations are



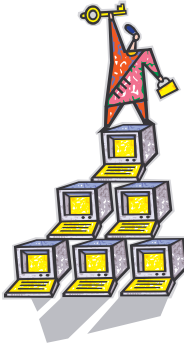
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based on CTE90 for RBC, this means that the outcomes from only 10% of the scenarios are actually used, and the rest are discarded (at least until CTE65 is required next year!). Once you identify these discarded scenarios, you can save processing time by omitting them. This can be especially useful when performing sensitivity tests on various assumptions since running models numerous times, even with a grouped census, would be time prohibitive. One way to identify the scenarios driving the CTE90 is to perform a preliminary valuation before the valuation date using recent data and a grouped census.

Conclusion

C3 Phase II is complex and involved, with many moving parts. Expect anomalous results to crop up when viewing the stochastic modeling and Standard Scenario runs. Sometimes, these are due to errors in your modeling or in the data – but other times, they are a correct, but hard to explain, product of this complex process.



The adoption of any new regulation should always be a signal to the insurer and reinsurer to review treaty language, to gauge any impact. This is particularly true for C3 Phase II, because the final Standard Scenario methodology is a huge departure from what actuaries might have once expected. If insurers are hedging their risks, the adoption of a new regulation will have a similar requirement, as the insurer must be aware of their claim obligations under an adverse scenario (even if they feel it is based on unreasonable assumptions), and they must demonstrate that the hedge recoveries will dovetail with their claim obligation. Although every insurer will differ, some companies will experience a significant increase in their cost of risk management (not even including the cost to figure that out!).

With the complexity of the guidelines and the time consuming calculations, it is critical to perform sufficient testing to ensure that the final RBC has not been compromised by any shortcuts taken. Finding the right balance between saving time and preserving accuracy in the final result is one of the major challenges of C3 Phase II.

Another Editor's Note: Yes this was a long article but what did you expect with four actuaries collaborating on this exciting topic!



2005 Dental PPO Survey - Don't forget to contact Ruth Ann if you'd like to participate.

Ruth Ann to present Dental PPO Survey results at the Group Underwriters Association of America meeting in Orlando in November.

Rich Tucker presented at 2005 annual NAVA meeting in New York City, providing the latest information on Index Annuity Market Trends.

Annual SOA Meeting - Ruth Ann will be a panelist at the "Starting Your Own Business" seminar. Others from RIA will also be attending this conference. We hope to see you there.

Special Topic Forums - In addition to the C3 Phase 2 Forum described on page 1, we will gladly establish a forum on any other topic of interest to you. Please contact Inger Harrington with your ideas.

Emily Brooke Osit -Sally and Alan Osit are the proud new parents of Emily, their fourth child and second daughter.

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