



SOCIETY OF ACTUARIES

Article from:

Reinsurance News

July 2013 – Issue 76

The Future Is Now

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Editor's Note: This article was previously published in the September 2012 issue of Best's Review magazine.

Life insurers must carefully address the premium levels for large term in-force blocks that are now entering their renewal periods.

A little more than a decade ago, as Regulation XXX was being introduced in the life insurance industry and term insurance products were being developed with guaranteed level premiums followed by indeterminate or non-guaranteed premium rates beyond that initial guarantee period, not much thought was given to the level of the rates beyond the guarantee period. If anything, the indeterminate rates were set conservatively high, given there would be the option to modify them at a later time.

Over this same time period, more than \$15 trillion of term insurance face amount was sold. Today, the industry finds itself in a situation of stagnant new business growth at the same time that it is seeing significant portions of that business entering the post-level-premium period and potentially lapsing from their books. What was once an issue of the future is now an issue of the present.

This issue was further highlighted in 2009 when the Society of Actuaries (SOA) sponsored a survey and subsequent report on post-level mortality and lapse assumptions and experience. There has been growing realization that companies were moving into a virtual unknown world with very little data and no real strategy to manage their current in-force risk and to properly plan for future risk via product development initiatives. Implications on financial results—of not only how much business was likely to lapse in the coming years, but what would be the mortality profile of those that remained—became a very real issue.

For companies still amortizing deferred acquisition costs during this post-level period on their in-force blocks, the question of whether there would be enough embedded value in the persisting block to avoid recoverability issues has arisen. As companies are trying to conserve as much of their term business at adequate margins as possible, policyowners can be expected to make the logical, if not obvious, decision to either let their policies lapse, convert to permanent insurance, or continue on with the coverage for at least a limited time period.

ADDRESSING THE RISK

With the many reports that have been published over the past couple of years, the industry is slowly beginning to understand the risk associated with these post-level policies and react to the experience that is being gathered. The industry, in order to really address the issue at hand, must start with a common understanding of what is the fundamental business question that it's trying to answer. While each company may have some unique circumstances, most companies operate in the same manner. Each client company is looking to maximize value, whether defined as policyholder or shareholder value, or market-consistent embedded value, or in whatever manner "value" is defined within an organization.

On the surface, the goal of maximizing value would seem to be relatively straightforward. But by digging deeper, it becomes clear that maximizing value is one of the unique and complex issues that the industry faces today. It's worth noting that there are secondary considerations as well, such as continuing the ongoing life insurance contract with policyholders and creating or maintaining workable solutions with the reinsurers of these products that frequently took as much as 90 percent of the underlying risk.

Value creation in the post-level-term period is defined as the confluence of three related but distinct variables. Generally speaking, these variables are considered in a linear fashion. In the first duration after the level-premium period, a sizable increase in premium rates occurs—variable 1. This increase triggers a level of shock lapse—variable 2. This shock lapse leads to a disproportionate number of relatively healthy lives leaving the risk pool, which results in a disproportionate number of relatively unhealthy lives causing a mortality deterioration to occur—variable 3.

The concept and the direction of these variables are very simple to see. The higher the premium jump is, the greater the shock lapse and the higher the mortality deterioration will be. Conversely, the lower the premium jump is, the lower the shock lapse and the lower the mortality deterioration will be. However, directional movement is one thing but finding the point that maximizes value is a very different thing.



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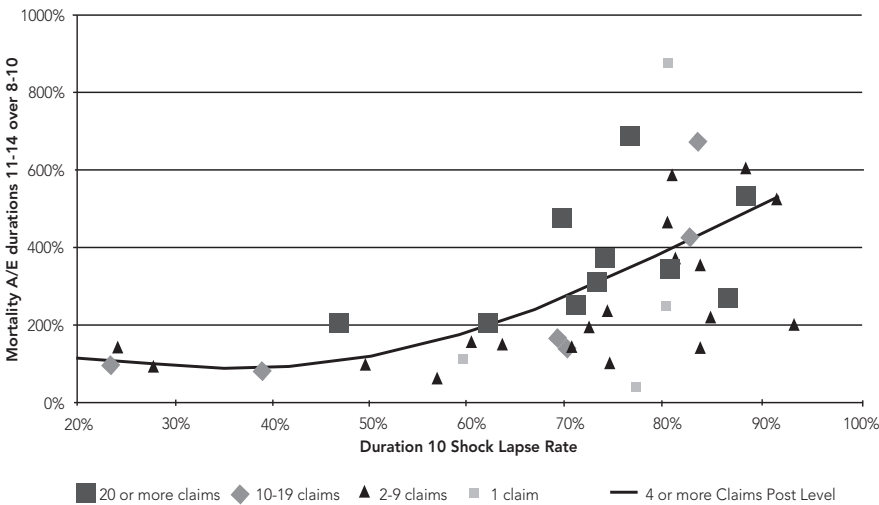
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Adding to the complexity, while experience immediately after the level-premium period has started to materialize, subsequent lapse rates and ongoing mortality deterioration are unclear. This dimension has been of less focus, but it may well be the most important dimension to understand. Not only are there material lapses beyond the first post-level duration, but the resulting mortality for each subsequent duration is a combination of the deteriorated mortality produced by more and more durational lapse implications.

Let's start with the basics to understand the complexity of the issue. The following graph shows the interaction between shock lapse and mortality deterioration. While this graph is derived from Hannover Life Re data, similar graphs have been produced in the SOA's post-level studies.

Shock Lapse vs. Mort. Deterioration by Face
Using 2008 VBT



It might seem like a simple exercise to understand the interaction of the shock lapse and the resulting mortality deterioration, but it isn't that easy. If one works from the right side of the graph to the left and determines the marginal mortality deterioration that occurs with the marginal lapse, the following general pattern develops:

Lapse	Persisters	Relative Risk	Marginal Persisters	Marginal Relative Risk
50%	50%	121%	50%	-124%
60%	40%	182%	10%	-121%
65%	35%	226%	5%	-78%
70%	30%	276%	5%	-4%
75%	25%	332%	5%	94%
80%	20%	392%	5%	211%
85%	15%	452%	5%	336%
90%	10%	510%	5%	458%
95%	5%	562%	5%	562%

The first three columns in the chart are just empirical observations—stringing together the various data points that are available from experience of a variety of companies. The last two columns show the mathematical implications of this data and must be solved from the bottom up.

As an example, the math is:
 $10\% * 510\% = 5\% * 562\% + 5\% * X$
 $X = (10\% * 510\% - 5\% * 562\%) / 5\%$
 $X = 458\%$

This table shows that, at first, the graph appears reasonable. But when the pieces are broken down to the most basic component parts, nonsensical implications can and do occur.

In order to “fix” this problem, one has to think in terms of two solutions:

1. The graph really isn't a continuous curve where the shock lapse and the mortality deterioration are the only two variables in play.
2. The building blocks must make sense, and they are very sensitive to minor movements in the underlying curve.

The answer is partially combined in both statements. While the interaction of lapses and mortality deterioration has been studied and thought about for roughly 30

years, adding the variable of how changes in premium rates will impact these policyowner behavior variables has been contemplated much less.

As noted earlier, for an insurance company to maximize its embedded value of this post-level business, it really comes down to maintaining as many policyowners at the highest rate possible without increasing the aggregate level of claims. Generally speaking, the manner in which the industry has gone about maximizing this value is to focus on maintaining an optimal number of policyowners. The more fundamental goal that needs to be achieved in such an exercise is that the aggregate premium revenue must go up if the premium rate decreases.

When a company seeks to increase the number of persisting policyowners by decreasing the premium rates charged, as a consequence they also are increasing the amount of claims that will be incurred. This is because the companies will have the same policyowners that were going to persist before, plus additional policyowners, some of whom will result in a death claim. A simple example (looking at the first duration post level) demonstrates this dynamic. (See chart below)

In this example, a company currently has a jump in its post-level premiums of 10 times the level premium and currently is experiencing an 85 percent shock lapse rate. The company desires to increase the persistency rate by lowering premiums and considers three options: lower the premium jump to 7.5 times the level premium (Option A), six times (Option B), or four times (Option C).

Option A results in no aggregate increase in collected premiums and a modest increase in claims. Option C shows an increase in aggregate premiums, but this is more than offset by the additional expected claims. Option B produces an aggregate premium increase by more-than-aggregate claims and thus generates the optimal results among the three options. Clearly, the results of such an example are dependent upon the assumptions used, and the assumptions used are dependent on a number of very specific factors, such as:

- The level of conversion activity that occurs.
- The conversion language in the term policy.
- Which products are available for conversion.
- Whether the policyholder is “orphaned” or has an agent actively involved.
- The size of policy and/or premium, where absolute amounts tend to trump percentage changes in the premium rate.

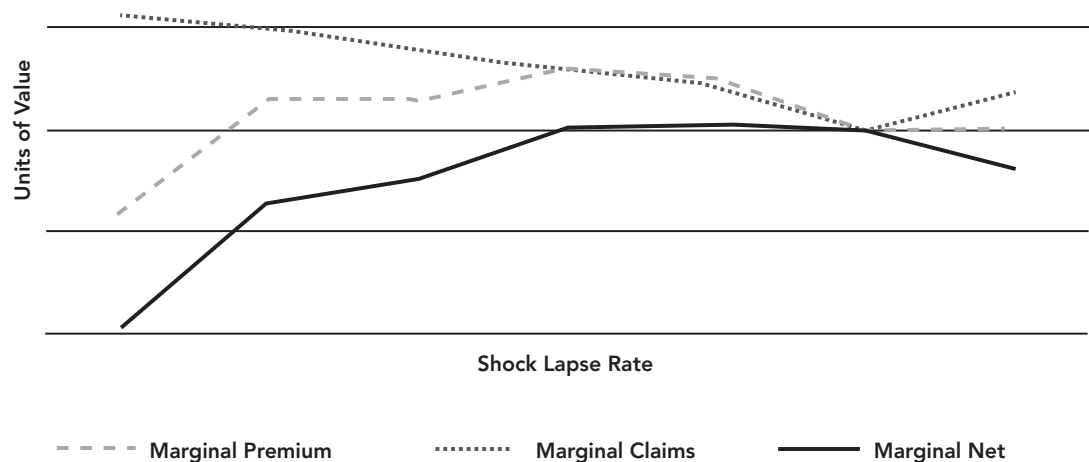
There can be a wide range of premium levels and associated shock lapse rate assumptions that produce roughly the same amount of total profit. It can be very difficult to significantly leverage any reasonable scenario into substantially higher profit expectations. The following graph shows an example of the interplay between the variables across a broader spectrum of premium rates and shock lapse assumptions. (See chart on pg. 32)

The dark blue line represents the difference in marginal net income. The base case is defined at the intersection of the three lines. There is a fairly wide range where very

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	Premium Jump	Persisting Group	Mortality Deterioration	Unit Premium Decrease	Persistency Increase	Unit Mortality Decrease	Aggregate Change in Premium	Aggregate Change in Claims
Baseline	10	15%	520%					
Option A	7.5	20%	405%	25%	33%	22.1%	0%	4%
Option B	6	28%	310%	20%	38%	23.5%	10%	5%
Option C	4	40%	215%	60%	167%	58.7%	7%	10%

Change Marginal Values



little actually occurs to the bottom line. Perhaps as interesting, though, is that large reductions in the post-level-premium rates appear to produce less-favorable results than do more modest reductions in premium rates.

It should be noted, however, that this is where the secondary goals come into play. A lower premium multiple may not materially move the profit picture, but it would certainly allow more policyholders to remain in force. In addition, the ceding company and the reinsurers may be in different positions relative to a given premium/shock lapse/mortality deterioration combination. Given that, historically, the reinsurance marketplace has assumed a sizable portion of the risk with these products, it certainly makes sense for the client company and the reinsurer to work together, and, in fact, may be contractually required.

EXPECTATIONS TO CONSIDER

Looking at durations beyond just the shock lapse duration presents an even more challenging exercise of determining what policyowner behavior to expect. With less and less homogeneous experience upon which to

base assumptions, a certain amount of reason must be used to ensure that the assumption for persistency is not overly optimistic.

For a block of term policies that is entering the post-level period, if one is working from a previous assumption where premium rates and ongoing cumulative lapse rates are relatively high, discussion of lowering premiums to increase persistency certainly makes sense. However, assuming that significantly more lives will persist as rates continue to rise each year ignores the strong likelihood that policyowners will make a decision to persist not only based on the increase in the premium rate from the premium paid in the prior year, but also based on the affordability of that premium relative to either what they paid during the level period and/or what they could pay by purchasing a new product.

Thus there should be an ultimate convergence in assumptions for cumulative persistency regardless of the pattern of post-level-premium rates being charged—for instance, a large increase followed by more modest increases versus a modest increase followed by progres-

//WHATEVER THE BASELINE DETERIORATION ASSUMPTION IS, IF PREMIUMS ARE LOWERED TO PRODUCE MORE PERSISTERS, THE NEW MORTALITY ASSUMPTION MUST MAKE SENSE.//

sively larger increases, both of which get to the same ultimate gross premium.

The other important consideration is the mortality deterioration model used. Many deterioration models exist, some more sophisticated than others and some fraught with potential deficiencies when it comes to ongoing large lapse rates. The critical issue to address when choosing a mortality deterioration model is that it must produce mortality that makes sense when considering the mortality of the marginal persisting group. That is, whatever the baseline deterioration assumption is, if premiums are lowered to produce more persisters, the new mortality assumption must make sense.

The assumption must consider that it is comprised of the original group of persisters whose mortality assumption doesn't change. The assumption includes the additional persisters whose mortality is no doubt better than the original group but should also be reasonable when compared to, for instance, newly underwritten mortality.

In the end, the issue of having a sound and comprehensive post-level strategy and model is difficult for a variety of reasons. Unfortunately, it is an issue that cannot be pushed forward to address in the future. Financial results are being affected today and will be an important part of how these companies manage their term insurance portfolios for years to come.

The fact is the amount of term insurance business that is or will be entering the post-level period continues to grow each year. Purely optimizing the end result from the insurance company's perspective will be a challenge because it involves embedded options and policyowner behavior that is difficult to predict, not to mention the need to work with reinsurance partners that have a significant stake in a sound strategy as well.

We continue to learn more about this with each passing year, but waiting until the picture is completely clear



will be too late to effectively manage this issue. In addition to the considerations already mentioned, prudent product development decisions today will largely dictate the ability to make effective product management decisions in the future.

KEY POINTS

The Situation: The life insurance industry is experiencing stagnant new business growth at the same time that the amount of term insurance business that is or will be entering the post-level period continues to grow each year.

The Significance: Life insurers are trying to ascertain the lapse behavior of policies in the post-level period and project the mortality profile of the policyowners that remain in force.

Watch For: Life insurers to develop and implement post-level strategies to address these issues. ■