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Judgmental Forecasting in Determining Policyholder Behavior Assumptions

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Introduction

The dynamic lapse assumption used for interest sensitive products can be very subjective yet have a significant impact on results. Whether it is economic capital (EC), European embedded value (EEV), International Financial Reporting Standards (IFRS), or some other project, the dynamic lapse assumption can be a crucial assumption for interest sensitive products. When running stochastic models that have extreme interest rate movements (and sometimes not so extreme), it can have an impact on your dynamic lapses and ultimately your results.

In discussions about the dynamic lapse assumption, people often ask me, "How do you know it is right?" or if I have experience studies to support it. My response is: when have we seen an example in the last 30 years since we have been selling universal life products, when interest rates have jumped up 300 to 500 basis points (bps) or more? I am confident in the assumption because of experience working with the assumption and in particular applying many of the judgmental forecasting methods outlined in the "Best Methods and Practices in Judgmental Forecasting" article by Alan Mills from the July 2010 *Forecasting & Futurism Newsletter*.

In this paper I explain how I used judgmental forecasting techniques to develop a dynamic lapse assumption. I define the techniques and explain how I combined these methods to develop a dynamic lapse assumption. I finish with the best practices used in adding controls and credibility to the assumption.

Methods and Implementation

We used the exponential formula as the base for the dynamic lapse formula, which takes into account the surrender charge. The other key factors are the competitor rate and the threshold (difference between the competitor rate and the credited rate) where the dynamic lapse is triggered. The competitor rate is determined from a weighted average formula of the treasury curve. It uses a moving average formula to try to capture competitors that credit

policyholders based on new money rates versus those that use portfolio rates.

The method I used to develop the dynamic lapse assumption has been an evolving process that incorporated several judgmental forecasting methods. I started with **expert opinion** to determine the assumptions to be used for each product line. *Expert opinion is where you ask the opinion of an expert. Although common, this method is perhaps the most error-prone.*[1]

I combined several sources of expert opinions to give me a starting point: Society of Actuaries (SOA) articles, industry recommendations from consultants and multiple actuaries within my company. The expert opinions helped me fit

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reasonable assumptions to the various products along the spectrum of interest rate sensitivity.

Next I tested the assumptions under multiple scenarios. *Scenario analysis is a process of forecasting future events by framing alternative possible outcomes in terms of story-like narrative scripts that often include the impact of events such as new technology, population shifts or changing consumer preferences. The method usually includes development of a most likely scenario, along with at least one optimistic and one pessimistic scenario.*[2]

I looked at a deterministic scenario, several increasing and several decreasing scenarios to see if the lapse rates under each of those scenarios seemed reasonable. For each of the scenarios, I not only looked at the lapse rates but also looked at the credited rates relative to the competitor rate to make sure it all made sense. This analysis helped us put the assumption and results in perspective.

This work started about five years ago and was modified over the years based on results from different projects and sensitivity testing. After what seemed like a lot of tweaking over the years, and then becoming involved in the market-consistent world of EC, we found we needed to reevaluate the assumption.

We started with a **traditional meeting**. *A traditional meeting is the most common method to obtain a judgmental forecast from a group of people, with unstructured discussion around a table.*[3]

We brainstormed on what made the most sense for the products and markets we sell to. We grouped our product into categories where we believed the sensitivity to lapse varied. For each of these groups we determined the key characteristics of each group: what is the market, average age, average face amount, purpose of the product, wealth of policyholders and maturity of the block?

Grouping into these categories gave us a different answer than what we initially thought. This was not based on experience but was based on our "expert opinion."

Once we felt we had a reasonable assumption we performed scenario analysis again. With our focus on market-consistent work, we looked at more extreme scenarios. We learned a lot from this testing and made further tweaks to the competitor rate and the threshold. We found that the threshold and competitor rate were much bigger drivers than we initially thought.

Structured analogy is another judgmental forecasting method that we used. *It compares a recent series of events to a similar series that occurred in another context. Forecasted outcomes are then based on past actual outcomes in the other context.*[4]

We have had some experience in the past few years where we concluded we needed to further tweak the dynamic lapse assumption. There were situations in reality where the competitor rate was greater than credited rates beyond the formula thresholds. In almost all cases we did not see actual increased lapse rates from that time period; however our models indicated we would. With that experience we decided to increase the threshold for the low sensitivity groups. We did see some actual increased lapse rates in the high sensitivity group so we left that threshold the same.

Best Practices

In the Sarbanes-Oxley (SOX) world we now live in, it is important to implement controls and best practices around assumption setting. In keeping with the theme of judgmental forecasting, I hit on some of the best practices as defined in "Best Methods and Practices in Judgmental Forecasting" while developing the dynamic lapse assumption.

Several best practices employed were:

(1) Providing feedback. *One of the key findings of researchers is that records should be kept about judgmental forecasts, in order to provide the forecasters with feedback. Feedback is valuable because it enables the forecaster to learn.*[5]

(2) A forecast developed by a group, especially a **heterogeneous group,** *is generally more accurate than one by an individual, even if the individual is an expert.*[6]

(3) Providing checklists—*Give the forecaster a checklist of information categories relevant to the forecasting task. Checklists remind forecasters about factors relevant to their forecasts, and prevent them from being influenced by extraneous information.*[7]

(4) Requiring confidence intervals—*Require experts to use confidence intervals, rather than point predictions.*[8]

(5) Combine forecasts—*Researchers have found that combining judgmental forecasts with either statistical forecast or with other judgmental forecasts improves forecast accuracy.*[9]

No method stood out to me as being the single "best practice" but the combination of all five working together made for a better control framework and strengthened the credibility of the study.

Conclusion

The term judgmental forecasting was a new concept to me although I had been unknowingly using it for years. I found a lot of value in applying the methods and best practices to the dynamic lapse assumption. These methods helped me to put some rationale and structure around an assumption that is subjective and where there is a lack of experience to justify the assumption.

It is important to review the impact of the assumptions for all projects where the models are used. How does it impact your earnings on an EEV or IFRS basis? How does it impact your reserves on a statutory basis for cash flow testing or economic reserves for EC? How does it impact your value of new business or pricing internal rate of return (IRR)? It takes frequent monitoring of the results to make sure the assumption is behaving as you expect. Future assumptions are difficult to determine, especially in more extreme scenarios. The judgmental forecasting techniques have helped us to be as comfortable as we can be with the assumptions.

This was an assumption that evolved over time, applying at least four of the judgmental forecasting methods. Any of these methods alone was not as effective but using all four helped to develop a reasonable assumption. ▼

REFERENCES

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