Milliman VALUES™
2018 GLWB industry lapse study

Eileen S. Burns, FSA, MAAA
Matthias Kullowatz, ASA, MAAA

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In 2014, Milliman kicked off a series of variable annuity (VA) policyholder behavior experience studies using predictive analytics, starting with an industry lapse study. The goal of our Milliman VALUES™ series is to evaluate and improve common assumptions using advanced analytics, and to provide implementable suggestions.

Our 2018 Milliman VALUES Guaranteed Lifetime Withdrawal Benefit (GLWB) industry lapse and utilization studies included 3 million policyholders from eight large VA writers, representing roughly $350 billion of account value and covering a range of GLWB product designs as well as demographic attributes. Our experience spanned from 2007 through 2017. We studied when policyholders chose to begin taking lifetime withdrawals, how efficiently they continued to take them thereafter, and what drove them to lapse. With this lapse study, we significantly increase the amount of exposure in late durations, allowing us to better calibrate behavior out of the surrender charge period.

2018 lapse study takeaways

These are some of the insights from our 2018 GLWB industry lapse study. Figures in this section are based on the industry data supporting the lapse study and are stylized to convey relative likelihoods of lapse for the sake of comparison. Individual company experience will differ based on the demographic composition and product features in the block.

Policyholders who withdraw more or less than they are contractually allowed show higher tendency to lapse. Policyholders who consistently withdraw moderately more than the maximum allowed withdrawal amount (MAWA) are about three times as likely to lapse in the subsequent year as policyholders withdrawing amounts equal to the MAWA (i.e., efficiently). Policyholders taking moderately less than the MAWA are about 1.25 times as likely to lapse as those withdrawing efficiently.

Furthermore, if that same policyholder were to take extreme excess withdrawals in the year leading up to the shock year, reducing the benefit base by at least 70%, we predict that policyholder to lapse at a rate more than six times that of an otherwise identical policyholder taking efficient withdrawals during the shock year. This assumes the policyholder returns to efficient utilization during the shock year. A policyholder who

continues to take such large excess withdrawals into the shock year is more than 10 times as likely to lapse.

It is expected that many overutilizers take the next step and lapse. However, it may be surprising to realize that those who are taking smaller-than-allowed amounts are also more likely than efficient utilizers to exit the policy. Companies should consider the potential impact of differentiating by past utilization behavior when setting lapse assumptions, and how best to implement that factor in actuarial projection models.

Figure 1 presents the predicted annual lapse rate for four stylized policyholders who utilize their GLWB benefits in the given manner consistently.

FIGURE 1: ANNUAL LAPSE PREDICTION FOR DIFFERENT UTILIZERS
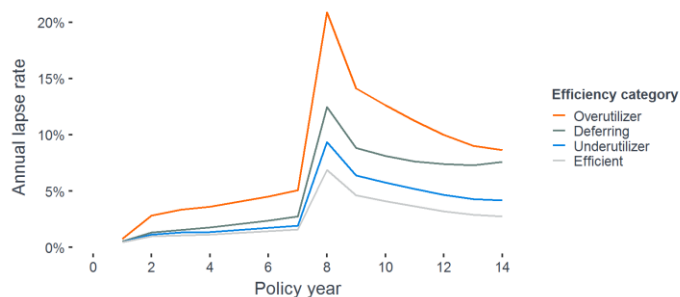
Policyholders with longer withdrawal histories are associated with lower lapse rates. A policyholder who has been withdrawing efficiently for five years is predicted to lapse at a rate equal to about 80% of that of an otherwise identical policyholder who has been withdrawing for just one year. Similarly, a policyholder who has been withdrawing for 10 years is predicted to lapse at a rate equal to about 70% that of a policyholder who has been withdrawing for one year. These effects are diminished if the policyholder has a recent history of inefficient utilization, i.e., either under- or over-withdrawing the MAWA. At the shortest end of the withdrawal history spectrum, a policyholder who is still deferring (by definition, withdrawing efficiently for zero years) is more likely to lapse than a policyholder who has been withdrawing efficiently for any positive length of time.

The effects of inefficient prior utilization on lapse behavior dissipate once a policyholder begins to take efficient withdrawals. Policyholders who moderately over- or underutilized in prior years, and then subsequently began to take efficient withdrawals (withdrawals equal to the maximum allowable amount), exhibit very similar lapse behavior as exclusively efficient policyholders.

Non-lifetime ad hoc withdrawals are predictive of elevated subsequent lapses. Policyholders who take an average non-lifetime ad hoc withdrawal (one that reduces the benefit base by 15%) before commencing GLWB utilization are more than three times as likely to lapse in the following quarter as those who do not take such a withdrawal.

Experience indicates that policyholders in later durations who are deep in-the-money tend toward an ultimate lapse rate of up to 2% annually. In an effort to estimate ultimate lapse rates, we segmented our industry data set to policies with surrender charge periods of three to seven years, who were in policy year 9 or later, and who had withdrawn efficiently—within 1% of the allowable amount—in the prior year. We grouped these records by moneyness buckets, and we observed the trend in lapse experience across moneyness. We define a policy's moneyness as the ratio of the GLWB benefit base to the account value. For moneyness ratios of 2.0 and greater, industry average lapse rates remain stable around 2% annually. From company to company, we observed a range of suggested ultimate lapse rates between 1% and 2.5% annually.

We expect that emerging experience in the coming years will allow us to identify credible trends in the lapse floor rates across later durations, and also allow us to test the consistency of these lapse floor rates across calendar years.

Lapse behavior is sensitive to the moneyness of GLWB guarantees in all durations after the surrender charge period ends. We find strong evidence of this dynamic moneyness lapse effect (where more in-the-money policies lapse at lower rates) only after the surrender charge period is complete. We do not find evidence of a dynamic moneyness lapse effect during the surrender charge period.

Lapse rates generally increase throughout the surrender charge period, and a pronounced shock lapse occurs in the quarter immediately after the surrender charge period ends. For many surrender charge schedules, this gradual increase in lapse rates throughout the surrender charge period coincides with surrender charge penalties becoming less severe. Depending on the moneyness of the GLWB guarantees, lapse rates in the shock quarter (the quarter immediately after the surrender charge ends) are five to nine times greater than the rates observed in the last quarter of the surrender charge period.

Figure 2 shows the predicted annual lapse rates for products with seven-year surrender charge periods that are at-the-money (i.e., when the moneyness ratio is 1.0).

FIGURE 2: ANNUAL LAPSE PREDICTION FOR 7-YEAR PRODUCTS
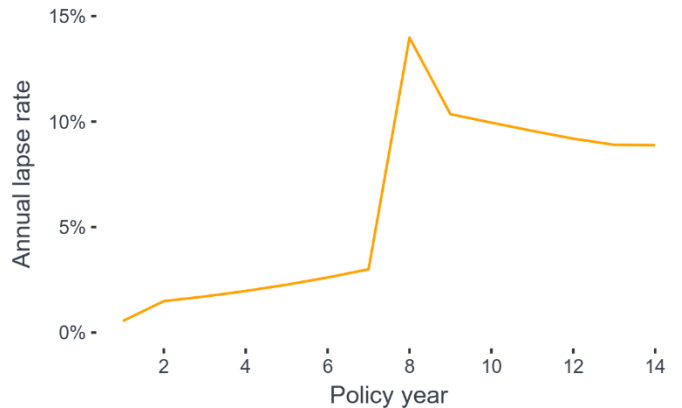
Lapse rates fall significantly in the quarter just after the shock lapse, and then decline gradually thereafter. In the quarter immediately after the shock lapse, lapse rates decrease by over 50%. In the five years following the shock lapse, rates fall by approximately 30% from the highs experienced in the first quarter after the shock lapse. Figure 3 shows predicted quarterly lapse rates for a policy with a seven-year surrender charge period, segmented by commonly observed moneyness ratios (ITM). We show quarterly rates here to emphasize that the bulk of the shock effect is weighted toward the first quarter after the end of the surrender charge period.

FIGURE 3: QUARTERLY LAPSE PREDICTION BY IN-THE-MONEYNESS (ITM)
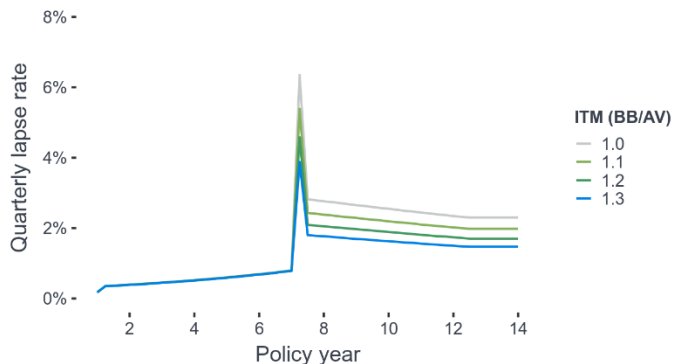
Future plans

Building off our VALUES™ studies, we are currently researching a number of distinct items, including:

- Testing the impact on projected cash flows of using a lapse assumption that includes withdrawal efficiency drivers
- Looking for select-and-ultimate effects in GLWB mortality, as well as other interesting mortality indicators for GLWB products
- Quantifying credible lapse effects by distributor firms, i.e., which distribution firms are associated with significantly different lapse rates

Our goal

This study builds on the effort we began in 2014 to provide insights into policyholder behavior based on scientifically sound principles. The report contains a comprehensive analysis of all the drivers we studied related to GLWB lapse behavior, and for each driver the report provides more details, including charts, tables, etc. It also provides both a baseline predictive lapse model function, with typical industry drivers, as well as details about our expanded lapse model, which included past utilization behavior as a driver of lapse. The baseline lapse model is designed for straightforward implementation in an actuarial projection.

We go beyond the report, however, giving subscribers access to Recon® GLWB, an interactive, web-based platform that allows them to visualize and download both the data and predictions from both models in an effective way. Recon GLWB is updated each quarter as participants send in updated experience data. Each year, we fully refresh the platform with updated models and new insights based on the VALUES studies.

Our goal is to continue to expand the insights we provide via the VALUES studies on the Recon platform to help our clients:

- Closely monitor the emerging industry experience
- Use industry data to benchmark company experience against the industry and supplement assumption setting, particularly where a company's own experience is scarce
- Allow companies with no GLWB products to get a view on policyholder behavior as they contemplate market entry
- Support in-force management and product development strategies

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For more information on the purchase of the full 2018 GLWB utilization or lapse report, and to participate in our ongoing industry experience studies, please contact:

Eileen Burns
eileen.burns@milliman.com

Jenny Jin
jenny.jin@milliman.com

Vince Haupt
vincent.haupt@milliman.com