MILLIMAN WHITE PAPER

Milliman VALUES™ 2020 GLWB industry utilization study

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Overall, GLWB withdrawal commencement rates were deflated while withdrawal efficiency patterns remained unchanged across 2020.

In 2014, Milliman kicked off a series of variable annuity (VA) policyholder behavior experience studies using predictive analytics, starting with an industry lapse study. Since then, we have expanded the study to withdrawal behaviors as well as mortality. The goal of this Milliman VALUES™ series is to evaluate and improve common assumptions using advanced analytics, and to provide implementable suggestions.

Subscribers receive all annual studies and access to Recon® GLWB, an interactive web-based platform that allows users to explore industry data, compare it to their company's experience, and examine how different annuity settings are expected to change policyholder behaviors. Recon is refreshed quarterly with new data, allowing subscribers to keep up on emerging trends in policyholder behavior.

Our 2020 Milliman VALUES Guaranteed Lifetime Withdrawal Benefit (GLWB) industry lapse and utilization studies include 3.3 million policyholders from seven large VA writers, representing roughly $391 billion of initial account value, and covering a range of GLWB product designs as well as demographic attributes. Our experience spanned from 2003 through the end of 2020, therefore spanning most of the first year of the COVID-19 pandemic. We studied when policyholders chose to begin taking lifetime withdrawals, how efficiently they continued to take them thereafter, and what drove them to lapse.

In this year's utilization study, we observed more than 165,000 policyholders with rollup products deferring their GLWB withdrawal commencement beyond the 10th policy duration, up almost threefold from 57,000 in our 2019 study. We continued to fit three predictive models to aid in assessing policyholder behaviors: a withdrawal commencement decision model, an *annual* utilization efficiency model, and a *lifetime* utilization efficiency model.

2020 utilization study takeaways

The full VALUES utilization report includes details about our predictive experience models and their coefficients, as well as a wide range of insights and takeaways into policyholder behavior. In this summary, we focus on some of our findings related to policyholder behavior during the pandemic versus how Milliman would have expected them to behave in the absence of the pandemic.

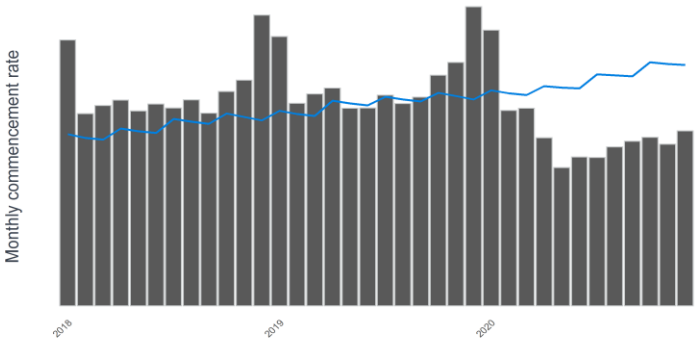
Prior to 2019, policyholders with tax-qualified funds had been subject to required minimum distribution (RMD) withdrawals from at least one account in the year they turned 70.5. With the passage of the Setting Every Community Up for Retirement Enhancement (SECURE) Act at the end of 2019, that age was permanently increased to 72. In response to the pandemic, the passage of the CARES Act in March 2020 temporarily waived RMDs for 2020, but they are now required again from policyholders who turn 72 in 2021.

Takeaways and figures in this section are based on the industry data supporting the utilization study and are stylized to convey relative likelihoods of utilization behavior for the sake of comparison. Individual company experience will differ based on the demographic composition and product features in its block.

Withdrawal commencement rates in 2020 were uniformly reduced beginning in the second quarter relative to the preceding three years. Throughout 2020, Recon GLWB subscribers were provided a quarterly emerging experience study update. The 2020 Q3 update concluded with the quote, "Overall, the effects of the COVID-19 pandemic on policyholders has been *in*action." With respect to withdrawal and efficiency patterns, this statement continues to apply throughout 2020.

Relative to both 2018 and 2019, withdrawal commencement rates remained low throughout the entirety of 2020. Our withdrawal timing model considers the policyholder age, policy duration, tax-qualified status, and RMD-eligible status, as well as the annual GLWB rollup features of the contract. Figure 1 illustrates the gap between the actual (grey bars) and the model-expected withdrawal rate (blue line). This gap suggests a shock, a mean-shift in policyholders' deferral probability that will not be captured without a binary variable to capture "RMD waived."

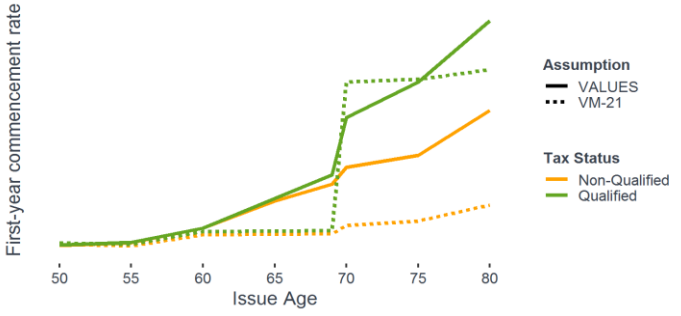
FIGURE 1: ACTUAL VS MODEL-EXPECTED WITHDRAWAL COMMENCEMENT RATES, 2018-2020



This decline was independent of the size of the policy's GLWB benefit base. Among the patterns that have remained unchanged is that smaller policies, measured by the first-observed GLWB benefit base value, were more likely to defer withdrawals than larger policies.

There is a shock commencement rate in a policy's first rider year. The magnitude of the shock varies by issue age and tax-qualified status. Industry experience differs significantly from VM-21 prescribed assumptions. Considering the recently adopted VM-21 withdrawal delay cohort method (WDCM) that prescribes withdrawal probabilities as a function of the actuarial present value (APV) of a GLWB, we revisited the topic of first-year withdrawal rate shocks. The rate of utilization in the first quarter remained a constant 7%, presenting no change from 2019 Q1 to 2020 Q4, but we discovered significant differences between industry experience and VM-21 assumptions in the first-rider-year commencement rates (Figure 2). This is likely because since the benefit's APV is not noticeably greater in year 1 than in subsequent years, the VM-21 assumption does not include a first-year shock.

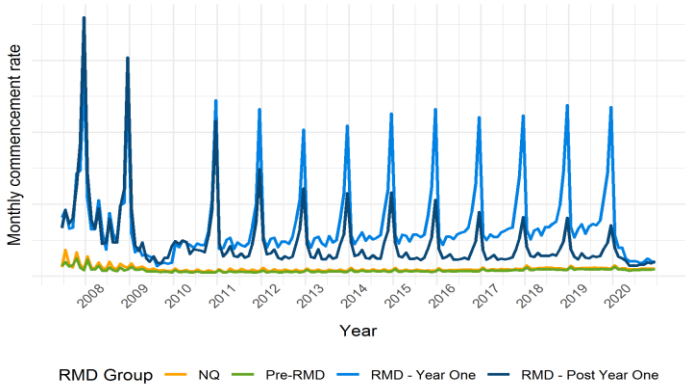
FIGURE 2: COMPARISON OF FIRST-YEAR WITHDRAWAL COMMENCEMENT RATE ASSUMPTIONS BY ISSUE AGE AND TAX-QUALIFIED STATUS – VALUES VS VM-21



Policyholders remain sensitive to both the rollup rate and the potential future increases in the withdrawal rate in their decision to commence withdrawals. The VALUES model expects greater spread in the commencement deferral rate between policies with no, low, and high rollup rates than do the VM-21 assumptions. We suspect this is because policyholders are not calculating actuarial present value, thus overvaluing the difference in annual rollup rates. The VALUES model also expects lower deferral probabilities for policies with no potential increase in the withdrawal rate than the corresponding VM-21 rates.

Withdrawal commencement rates in the fourth quarter—among those tax-qualified policyholders older than 70—have fallen proportionally by about 90% for those at age 70 and by about 60% for those in subsequent age groups older than 70, as compared to recent fourth quarters since 2017. Withdrawal commencement trends have followed a steady pattern, as shown in Figure 3, allowing us to approximate the short-term RMD effects in 2020. The fourth quarter is a typical time for RMD-eligible policyholders to commence withdrawals, and we see a missing fourth-quarter commencement rate shock for policies that would have been facing RMD commencement during the 2020 calendar year, just as there was no RMD-based withdrawal commencement shock in 2009.

FIGURE 3: WITHDRAWAL COMMENCEMENT RATES FROM 2007-2020 BY RMD STATUS



Overall, the COVID-19 pandemic did not affect efficiency patterns. Policyholders with GLWBs who have commenced withdrawals continued to utilize as they have historically. Policyholder withdrawal efficiency distributions were largely unperturbed, efficiency states from 2018 and 2019 being ultimately predictive of the 2020 withdrawal efficiency state for any given policy. The policyholder's utilization efficiency in prior years' utilization continues to be a strong predictor of lapse behavior. For example, a policyholder who has been overutilizing for the previous two years only has a 7.3% probability of transitioning to an efficient or under-efficient state.

RELATED INSIGHTS

- Joint policyholders are more likely to defer GLWB utilization until the terminus of the rollup period than singly-owned contracts.
- We leveraged our increased data size to improve our utilization models by using more specific model formulas that allow us to home in on more granular cohorts. For example, now that we have more policies beyond rider duration 10, we have better quantified late duration trends in our withdrawal commencement probability models.
- Policyholders who withdrew during the anniversary quarter of a policy year—i.e., quarters 1, 5, 9, etc.—are more likely to be efficient thereafter. The effect is strongest in the first three years of withdrawals, but there is some residual effect even after the three-year mark.
- The effects of non-lifetime withdrawals are predictive of future lapse, and the effect of the withdrawal on increased probability of lapse sustains for at least a policy year.

PLANS FOR FUTURE STUDIES

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

- Investigate third-party data as drivers of policyholder behavior. This is in active development for our industry study on indexed annuities.
- Model a possible upward recovery in the withdrawal commencement rate for policies in force during 2021.
- Investigate the effects of macroeconomic factors on variable annuity lapse and utilization behavior (beyond dynamic moneyness factors).

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