



Retirement Income: Analyzed

Retirement Income Analytics Newsletter from The QWeMA Group

QUESTION: You have a Variable Annuity (VA) with a Guaranteed Lifetime Income Benefit (GLiB) income rider that is underwater. The account is down quite substantially from its starting point. What are the chances the account value will recover and the income will re-set to a higher level?

This is a great question. How would you answer it?

This newsletter will show you how to use the Probability of a GLiB Re-set Function (available in the newest version of QVEL) to calculate the probability of a re-set- and higher income- for your clients.

Taking a closer look

To make this more concrete, let's say for example you have two clients, Pete and Jill. Both retired in January of 2007 at the age of 65. At the time they both purchased a GLiB with an income base of \$500,000, a withdrawal rate of 5%, management and rider fees of 3% and 1% respectively and began taking income from the product immediately. After their purchase, they were both left with \$500,000 in their accounts.

When Pete retired he chose to place his \$500,000 in a conservative portfolio, consisting of a 20% allocation to equity and an 80% to fixed income. Pete chose such an allocation strategy because, "he did not want to take the risk of losing much money". Jill on the other hand was much less risk averse and chose to place her \$500,000 in an aggressive portfolio, consisting of an 80% allocation to equity and a 20% to fixed income. Note, in this simple example, both Jill and Pete allocated their equity positions in the iShares Russell 3000 Index ETF and their fixed income positions in the iShares iBoxx Investment Grade Corporate Bond ETF.

Looking forward four years: How have their asset allocation strategies worked out?

In January of 2011, Pete has an account value of \$325,736 and an income base of \$534,368. While at the same time, Jill has an account value of \$408,753 and an income base of \$514,150. Obviously, regardless of the chosen strategy both Pete and Jill are worse off. They both find themselves in a position where their respective account values are much less than their income bases.

In January 2011, Pete and Jill return to their advisor and are curious about the chances of a re-setting occurring in the next five years assuming they do not change their respective strategies. The use of the aforementioned Probability of a GLiB Re-Set function in QVEL, which relies on analytics and not time consuming Monte Carlo simulations, can quickly and easily allow an advisor to provide an answer to this question. This function provides the probability of a re-set occurring within a given time frame given the appropriate values for the account, income base, withdrawal, volatility, return and fees; which encompass management fees, which are a percentage of assets, and rider fees, which are a percentage of the income base.

In order to properly apply the function a brief analysis of expected return and volatility must be conducted. If someone were to gather daily adjusted closing prices for the aforementioned ETFs, from July 31, 2002 to January 19, 2011, calculate the aforementioned parameters and round the results to the nearest tenth, they would see that the iShares iBoxx Investment Grade Corporate Bond ETF possesses an expected annual return of 5.9% and annual volatility of 9.4%; while the iShares Russell 3000 Index ETF would yield an expected annual return of 6.5% and an annual volatility of 21.5% and combined, these ETFs have a correlation coefficient of 8.4% over the same time period.

It is worth noting the fact that the above historical analysis is used in establishing values for a forward looking equation. We are all aware that past performance is no indication of future performance and that it is naïve to believe that because fixed income markets have performed well in the past few years that they will continue to do so for an extended period. Given the current yield curve, which cannot move much lower, yields are expected to rise over time. However, this assumption is made as values are needed as input parameters for expected return and volatility. An advisor with their own expectations of expected return and or volatility can easily change these values in QVEL and produce probabilities in line with these expectations.

With the historical analysis and disclaimer complete we can now return our focus to Pete and Jill. Given Pete's weight allocation and the analysis conducted above, we know that he can expect an annual return of 6.0% and an annual volatility of 9.0%; while Jill's can expect an annual return of 6.4% and an annual volatility of 17.5%- again all figures are

rounded to the nearest tenth.

Here is how the Probability of a GLiB Re-set function appears as a regular function call in Excel, along with the solutions for Pete and Jill. To reiterate, this function provides the probability of a step-up occurring within a given time frame given the appropriate values for the account, income base, withdrawal, volatility, return and fees; which encompass management fees, which are a percentage of assets, and rider fees, which are a percentage of the income base.

B10		fx =PrResetGLIB(B2,B3,B6,B4,B5,B7,B8,B9)		
	A	B	C	D
1		Pete	Jill	
2	Income Base	\$534,368	\$514,150	
3	Account Value	\$325,736	\$408,754	
4	Expected Return	6.0%	6.4%	
5	Volatility	9.0%	17.5%	
6	Withdrawal	\$26,718	\$25,708	
7	Management Fee (% of Account Value)	3.0%	3.0%	
8	Rider Fee(% of Income Base)	1.0%	1.0%	
9	Time	5	5	
10	PrResetGLIB	0%	33%	

Looking at the screenshot, you can see that Pete has no chance of a re-set over the next five years while Jill has about a one-third chance.

How do those probabilities change if we look further into the future? Holding all parameters, aside from time, constant provides us with the QVEL results presented in Table 1; again the results are rounded to the nearest tenth. Table 1 demonstrates that Pete's probability of a re-set essentially does not change, while Jill's goes up by about another 5% to just under 4 in 10 by the 25th year.

Table 1					
Portfolio	QVEL Probability of Reset				
	Time (Years)				
	5	10	15	20	25
Pete	0.0%	0.1%	0.1%	0.1%	0.1%
Jill	33.2%	37.1%	37.9%	38.1%	38.1%

It is apparent that as time progresses re-set probabilities increase, albeit inconsequentially

in Pete's case, regardless of the strategy; which is to be expected as the account has more time to revert back to the income base. It is also obvious that Jill has the greater probability of re-set regardless of the time horizon; which can be attributable to the higher levels of volatility that she is choosing to take in her asset allocation strategy. The higher levels of volatility create this chance because there is a greater probability of an upside swing in the account value.

So, if a client is seeking a re-set from their current income base, aggressiveness may be desirable. That being said, with the greater chance of an upside swing, comes an increased chance of swing to the downside. It is possible that as Jill continues to make withdrawals from her account that financial markets take a turn for the worse and her account value is ruined. In which case, she is forced into a situation where she is no longer able see any step ups and is required to take the guaranteed 5% of her income base at the time of ruin for the remainder of her life.

Keep in mind that the above table assumes that neither Pete nor Jill choose to change their respective strategies and that asset management and rider fees are fixed. If they were to contemplate changing their levels of risk aversion and consider changing their strategies, a whole new set of probabilities would exist— all of which can be explored further via this same Probability of a GLiB Re-set QVEL function and changing the appropriate parameters. The same can be said for introducing a new, more realistic, fee structure to the scenarios.

Ultimately, decisions pertaining to levels of risk aversion primarily rest in the hands of the client. That being said, advisors can use QVEL to think and work through GLiB re-set probabilities with their clients to get clear insights into the right strategies moving forward, regardless of the starting point.

-- This month's newsletter was authored by Simon Dabrowski, Research Associate at The QWeMA Group.

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