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Investment Year Method: A Method to Align Renewal Credited Rates With Investment Strategy

By Max J. Rudolph

Interest rates cycle. Although they have been in decline for the past 40 years, they could rise in the future. One way to simplify the interest rate crediting process, making it transparent to policyholders, would be to follow a formulaic approach to setting rates tied to the investment strategy. A recent research paper[1] I wrote shows a method that can be defended as reasonable and equitable. There are others. There is no reason to reinvent the wheel when product designs can start with historical methods and improve them.

INTRODUCTION

Interest rate setting committees often set rates using rules of thumb, with little theoretical guidance about how renewal rates should be determined or transparency behind the actual process used. The method described here addresses a practical application of the investment year method (IYM) under various interest rate environments that is fair to both policyholder and insurer. It is meant to generate discussion about alternative methods to find one that works best for a specific situation. Insurance is a trust product, with consumers relying on insurers to treat them fairly, and credited rates are set prior to actual investment income being realized.

Aligning interest credited to policyholders with the investment income earned by a life insurer is a key component to meeting client expectations, but it is not straightforward. While the policyholder sees all of their premium included in the account value, whether life or annuity, the insurer has to borrow from surplus to pay initial expenses and set up capital. The statutory reserve requirements help by reflecting surrender charges, but an insurer generally makes an investment when a policy is sold. It generates profits on that investment through collecting charges from non-guaranteed elements like mortality, expenses and investment spread. Combined, they pay for death benefits, expenses, sales commissions, interest credited, capital charges and profit.

One method to set renewal credited rates is to formulaically estimate the asset rollover based on the needs of the liabilities using duration targets that vary based on year since issue. Since interest rates peaked in the early 1980s, the current generation of actuaries has no experience in a rising interest rate environment. Interest rate guarantees set in that era were often 4 percent or higher, and today's investments supporting these liabilities generally result in a credited rate tied to guarantees. Various methods have been used to adjust the credited rate over time. Most use formulas for guidance and are set by a committee. The experience gained from this process is less important when credited rates are already at the guaranteed rate, so this skill set is being lost.

THE BASICS OF THE INVESTMENT YEAR METHOD

Allocation of investment returns for non-guaranteed elements, such as dividends, or more complex products like universal life and indexed annuities, would follow the same general process, so the examples that follow will focus on non-participating

SPDA products as a simple example the practitioner can extend to other situations.

The IYM allocates premiums received from the policyholder into buckets that segment the cash based on when it was received. This approximates the actual times when assets are purchased that back the policy, providing intergenerational equity.

Traditionally, credited interest on account value (or participating) products was allocated using the portfolio method, taking the investment income from all general account assets and allocating it based on statutory reserves or some other metric. Often, an average reserve was calculated on a quarterly basis to allocate the earned investment income, and investment expenses and other charges were deducted using the same method. The metrics were converted to percentages for the administrative system to credit interest to individual policies.

The IYM for crediting strategy attempts to better align the amount credited to a client with the amount earned by the insurer. This is accomplished by developing a crediting strategy that is a proxy for the investment strategy. This method sets the credited rate in advance, often at the beginning of a policy year. This adds a layer of complexity over some group products that credit interest after the fact.

There are two general methods used to allocate investment income, and the terminology is also used for crediting interest to policyholders. The portfolio method uses the same rate across all policies backed by a set of assets, or a specific portfolio segment, independent of when the policy was purchased. All assets are grouped into one bucket. IYM aligns the income with a characteristic of the asset, generally when it was purchased. Liabilities are then mapped to these segments based on when premiums were received from a policyholder, forming buckets. Assets are then allocated to these buckets, representing the period when the original asset was purchased, even if a matured asset has been replaced. Buckets are rebalanced over time as net cash flows increase or decrease the policyholder's account value.

Account value products pass through net investment earnings to the consumer through the crediting rate methodology. This technique "unbundles" expense, risk and profit charges with the expectation of being equitable to the policyholder. Insurers will often include a distinct mortality charge for a life insurance policy and a spread fee charged in basis points,[2] a per-policy fee or per-thousand-of-face-amount fee to cover other expenses and risk charges. The policy is priced to meet a hurdle rate return on investment that incorporates the cost of holding capital. The methods described can be extended to variable and fixed indexed products, but the reader is left to contemplate those products once they have the basics of general account products in hand.
Since the credited rate must be set in advance, an insurer will create consensus about initial and renewal credited rates using an interest rate setting committee composed of product managers, investment professionals and often representatives of the corporate staff involved in asset-liability management. Actuaries may participate in various roles. Membership may be driven by logistical factors like the area responsible for implementing the credited rates into the administrative system. While these decisions often require negotiation between competing incentives, a team providing a place to start based on thorough modeling of various options can influence the process using logic and transparency. From there, competitive pressures may force the process to deviate from a theoretical basis.

SPDA EXAMPLE

The example shown in Figure 1 (page 3) is designed to highlight the methodology and not to be typical of the current or any prior market. An investment strategy builds from the risk-free rate, generally a constant maturity treasury (CMT), with a credit spread reflecting assets expected to be purchased and a deduction for the pricing spread to cover expenses and profits. Note that the CMT rates have been chosen to be far apart to better teach the method presented.

The new money supportable rate = five-year CMT + 80 bp credit spread for AA bonds – 140 bp pricing spread (round to near 25 bp).

If the five-year CMT at issue was 7.00%, then

New money supportable rate = 7.00% + .80% – 1.40% = 6.40% (rounded to 6.50%).

The renewal supportable rate = three-year CMT + 80 bp spread for AA bonds – 140 bp pricing spread (round to near 25 bp).

If the three-year CMT is 2.85%, then

Renewal supportable rate = 2.85% + .80% – 1.40% = 2.25%.

For each year since issue, a model determines the duration of the liability which has aged to that point (these can be set at issue or developed annually if results are expected to vary). A weighted average of the current credited rate and the renewal supportable rate for the following year is used to set the credited rate for year two:

- Current credited rate 6.50%, set at issue as described above
- Duration of liability after one policy year = 3.4
- Duration of liability after two policy years = 3.1
- Duration of liability after three policy years = 2.8
- Duration of liability after four policy years = 2.5
- Duration of liability after five policy years = 2.2
- Duration of liability after six policy years = 1.8
- Duration of liability after seven policy years = 1.6
- Interest rate guarantee = 1.5%

Calculations for the weighted average of the current credited rate and renewal supportable rate are shown in Figure 1.

Year two credited rate = $\left\{Current\ credited\ rate \times \left[\left(1-\left(\frac{1}{2\times D_1}\right)\right]+ Supportable\ renewal\ credited\ rate \times \left(\frac{1}{2\times D_1}\right)\right\}\right.$

where D_1 is the duration of the liability after one policy year

$$=\left\{6.50\% \times \left[\left(1-\left(\frac{1}{2\times 3.4}\right)\right)\right]+2.25\% \times \left(\frac{1}{2\times 3.4}\right)\right\}$$

$$= 6.50\% \times .85 + 2.25\% \times .15 = 5.86\%, which\ rounds\ to\ 5.75\%.$$

Year three credited rate =

$$=\left\{5.75\% \times \left[\left(1-\left(\frac{1}{2\times 3.1}\right)\right)\right]+2.25\% \times \left(\frac{1}{2\times 3.1}\right)\right\}$$

$$= 5.75\% \times .84 + 2.25\% \times .16 = 5.19\%, which\ rounds\ to\ 5.25\%.$$

Initial rounded results (constant three-year CMT after year one) for renewal credited rate starting with year two are 5.75%, 5.25%, 4.75%, 4.25%, 3.75%, 3.25% and 3.00%.
Interpretation:

- Rates earned by new purchases in this example have fallen 4.15% since issue (from 7.80% to 3.65%).
- Rates earned by the assets drop 75 bp, then 50 bp per year for five years, then 25 bp.
- Rates are still above the interest rate guarantee of 1.5%.
- Rates are still above the supportable renewal rate of 2.25%.

CONCLUSION

At some point conditions will change and insurers will revisit their approach to setting renewal credited rates. This method provides a perspective that can easily be defended theoretically if used directly, and provides a useful starting point in any case. By providing a proxy to the investment strategy the policyholder should feel they are being treated fairly when buying a contract that promises to pass through the investment results. ■

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ENDNOTES

1 *https://www.soa.org/resources/research-reports/2019/investment-year-method/* The accompanying spreadsheet on the SOA website can be studied or modified for other examples.

2 One basis point (bp) is the same as .01%; this terminology is typically preferred by investment professionals. These fees are charged based on the account value in an individual policy.

Figure 1
Example 1 Weighted Average of Current Credited Rate, Renewal Supportable Rate Calculations

Renewal Crediting Strategy	Supportable rates	5 yr CMT	AA spread	Pricing spread	Supportable rate
	New Money	3.00	0.80	1.40	2.40
Input items		3 yr CMT	AA spread	Pricing spread	
Output items	Renewal	2.85	0.80	1.40	2.25

Renewal credited rates utilizing effective duration to weight Renewal Rate weighting	End of Year	1	2	3	4	5	6	7	
	Duration	3.4	3.1	2.8	2.5	2.2	1.8	1.6	
	Assumed Rollover	15%	16%	18%	20%	23%	28%	31%	Inverse of 2 x duration

	Current Credited Rate	Recommended Renewal Rate (before rounding)						
Renewal supportable rate	6.50	2.25	2.25	2.25	2.25	2.25	2.25	2.25
	6.50	5.86	5.82	5.74	5.65	5.52	5.31	5.18
	6.25	5.65	5.61	5.53	5.45	5.33	5.13	5.01
	6.00	5.44	5.40	5.33	5.25	5.14	4.95	4.84
	5.75	5.23	5.19	5.12	5.05	4.95	4.77	4.67
	5.50	5.01	4.98	4.92	4.85	4.75	4.59	4.49
	5.25	4.80	4.77	4.71	4.65	4.56	4.41	4.32
	5.00	4.59	4.56	4.51	4.45	4.37	4.23	4.15
	4.75	4.38	4.35	4.30	4.25	4.18	4.05	3.98
	4.50	4.16	4.14	4.10	4.05	3.98	3.87	3.80
	4.25	3.95	3.93	3.89	3.85	3.79	3.69	3.63
	4.00	3.74	3.72	3.69	3.65	3.60	3.51	3.46
	3.75	3.53	3.51	3.48	3.45	3.41	3.33	3.29
	3.50	3.31	3.30	3.28	3.25	3.21	3.15	3.11
	3.25	3.10	3.09	3.07	3.05	3.02	2.97	2.94
	3.00	2.89	2.88	2.87	2.85	2.83	2.79	2.77
	2.75	2.68	2.67	2.66	2.65	2.64	2.61	2.60
	2.50	2.46	2.46	2.46	2.45	2.44	2.43	2.42
	2.25	2.25	2.25	2.25	2.25	2.25	2.25	2.25
	2.00	2.04	2.04	2.05	2.05	2.06	2.07	2.08
	1.75	1.83	1.83	1.84	1.85	1.87	1.89	1.91
	1.50	1.61	1.62	1.64	1.65	1.67	1.71	1.73
	1.25	1.40	1.41	1.43	1.45	1.48	1.53	1.56
	1.00	1.19	1.20	1.23	1.25	1.29	1.35	1.39
	0.75	0.98	0.99	1.02	1.05	1.10	1.17	1.22
	0.50	0.76	0.78	0.82	0.85	0.90	0.99	1.04
	0.25	0.55	0.57	0.61	0.65	0.71	0.81	0.87

Resulting credited interest rates		6.50	5.75	5.25	4.75	4.25	3.75	3.25	3.00

not adjusted for guaranteed rate of 1.5%

2019 Investment Symposium—Session 3A: Real Returns and Risk Premia: What Are the Issues?

By David Schraub

Author's note: This article reflects the discussions during the 2019 investment symposium on Oct. 27. In my opinion, COVID-19's ravaging impact on health and economy worldwide will lead to a paradigm shift. Short-historical average or through-the-cycle average methods both seem inappropriate to set investment assumptions. The economic impact of lockdown and the interventions from multiple levels of government across many countries globally are more impactful than economic trends in the short-, medium- and long-term.

This session commenced by framing the debate over the setting of asset return assumptions. It addressed past history. The session later incorporated panel views on the current investment environment.

One of the aims of the presentation was to provide audience members with some additional thoughts on how "reasonable" expected return assumptions can be set.

The following summarizes several of the points discussed and questions raised during the session:

I. We have experienced many good years of investment performance. Is it reasonable to establish a long-term assumption by taking some sort of the recent average? Is it appropriate to assume that we will continue to have good years going forward?

II. Conversely, should we now anticipate some bad years (assuming mean reversion is still alive) and incorporate a belief that markets are too high already?

III. One approach to setting assumptions would be to pick round numbers around the average, say, for 10–15 asset classes (e.g., five equity classes, a few bonds, real estate, some structured assets, risk free assets, etc.). Should we alter these so that they represent a through-the-cycle assumption?

IV. Alternatively, the GMO real return forecast (not shown here) shows an at-the-cycle assumption. These are snapshots in time but would change depending on where in the cycle we are at.

V. Should we incorporate some "artful" changes to the assumptions, given that we know how the investment will be used? For example, bond cash flows are already set. Do we know that a particular nominal rate will be earned since the bond will not be sold (i.e., we should not incorporate any optimized trading)?

VI. Bias anyone? Of course, there are incentives to setting an assumption optimistically on the pension side. But the assumption should be linked to portfolio construction. A small variation in assumptions will lead to large impacts, due to the long-term nature of the investments but also the liabilities.

VII. Some consideration has to be given to the credibility of the current period (i.e., do we have a historical comparable period of low interest rates and high asset valuations, as we may have today?). This can add some weight to the assumptions we choose.

VIII. Reporting to various stakeholders and at the board level is often done in nominal terms. Therefore, stating expect-

ed returns nominally is still the more popular approach. But this does not preclude us from incorporating real term assumptions into models.

IX. You should have a rationale and a story to justify and sell expert judgments. This helps support the assumptions chosen.

X. Can we or should we hide behind the market efficient hypothesis? This would imply that observed market pricing is correct and hence no bad or good years should be anticipated.

XI. Should you link the asset returns to the liability? Do you invest in similar risky vehicles? This can also impact the assumptions we choose, but also helps us assess how concerned we should be over the reasonableness of the assumptions we select.

XII. Should the assumptions and expectations change based on market conditions? If equities are high and interest rates are low, does that affect the assumptions going forward? Again, this raises the old debate between using an at-the-cycle or through-the-cycle assumption.

XIII. What is the financial risk if the assumptions are not met? How sensitive are the liabilities to them? That is another measure of how reasonable our assumptions should be.

XIV. Are there ways to manage this financial risk underlying the choice of assumptions?

XV. Should we build-in some conservatism? Even though this has value as well, if our aim is to produce reasonable assumptions, then we should not seek to introduce bias in either direction.

Hope that some of these considerations are helpful in your assumption-setting process! ■

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