

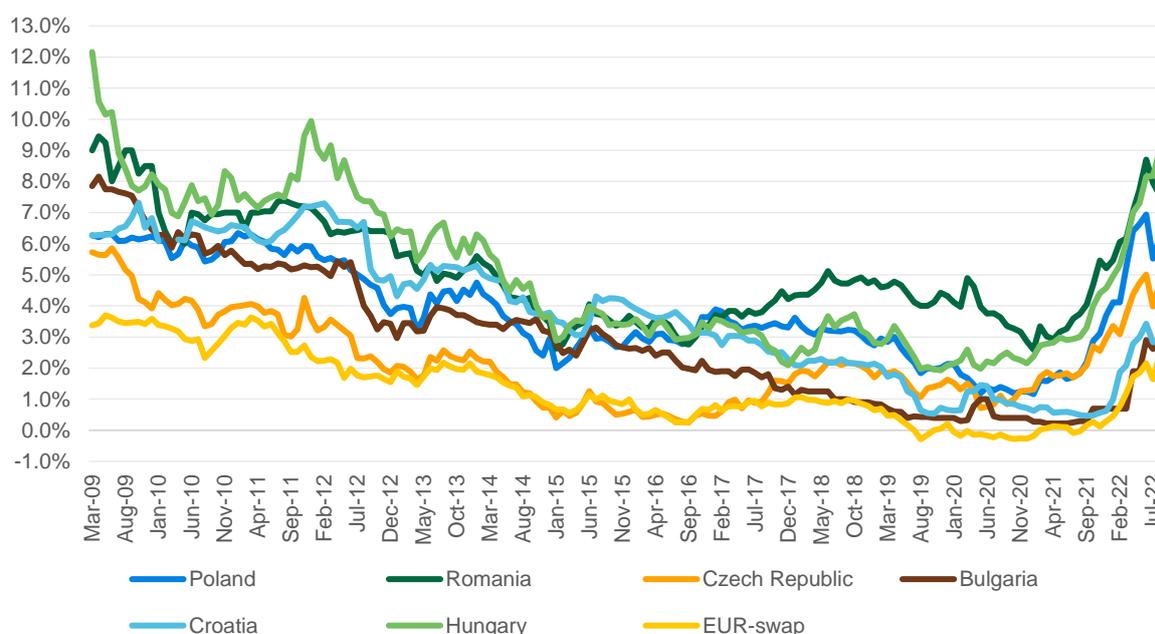
Challenges and opportunities for CEE insurers in the “Brave New World” of higher interest rates

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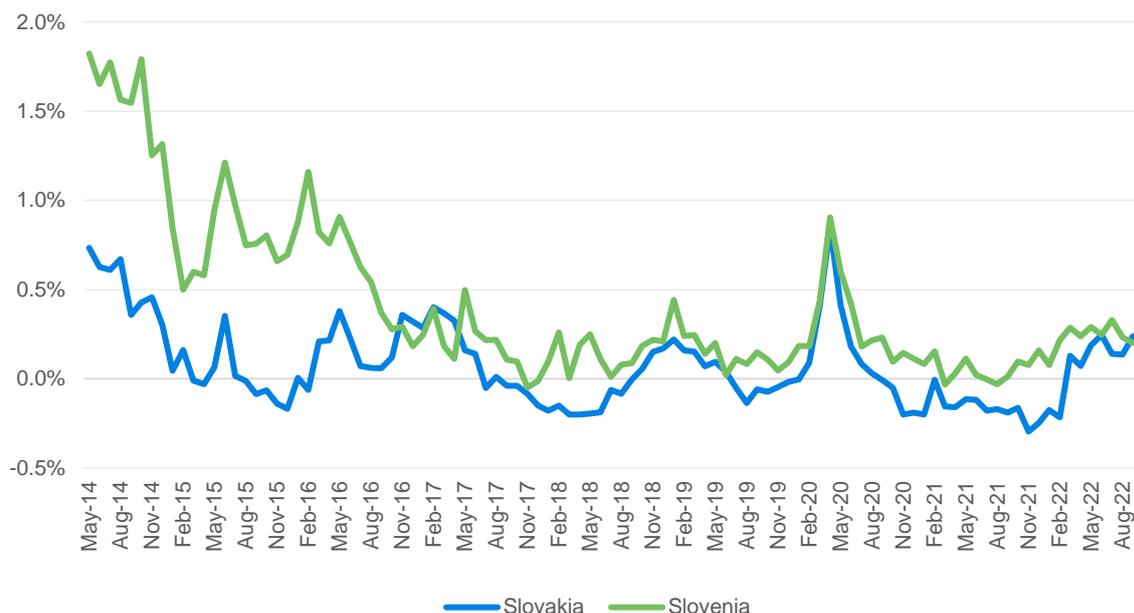
Insurance companies in Central and Eastern Europe (CEE) have become accustomed to low interest rates, which have declined rather steadily over a long period from the much higher levels seen in the first years after the end of the Communist era. During the last several months, macroeconomic and political factors have led to much higher interest rates across all European economies, including CEE.

FIGURE 1: HISTORICAL EVOLUTION OF 10-YEAR RATES FOR A SAMPLE OF COUNTRIES IN CENTRAL AND EASTERN EUROPE



For the CEE countries which have adopted the euro, the situation is a little bit different from that of countries still maintaining a national currency. On the one hand they have the additional stability of a larger economic block and the financial muscle of the European Central Bank (ECB). However, whereas Solvency II discount rates published by the European Insurance and Occupational Pensions Authority (EIOPA) for non-euro currencies are in most cases closely based on government bond yields, in euro economies the yields on local government bonds will not necessarily follow movements in the euro swap discount curve. This means that, to the extent that local government bonds are held, there can be a mismatch between assets and liabilities when spreads above the risk-free rates vary. Even though government bonds do not attract any capital charge under the Solvency II Standard Formula, spread volatility can hit solvency ratios. In the past, spreads on some euro-denominated government bonds of some CEE countries have widened significantly, but this has not happened to a large degree in the last couple of years.

FIGURE 2: HISTORICAL EVOLUTION OF SWAP SPREADS FOR 10-YEAR RATES FOR SLOVAKIA AND SLOVENIA



This radical change in the interest rate environment has many different implications for insurers, presenting challenges and opportunities which they have not seen for years. The impact of the change is both technical and strategic and we discuss some of the issues and possible responses to them in this short thought piece.

First, we note that the sudden increase of interest rates may create completely different situations on the Solvency II balance sheet. The impact on market valuation of assets and calculation of the Best Estimate of Liabilities (BEL) is rather evident. In the following sections we draw attention to the more subtle impacts on the Solvency Capital Requirement (SCR), especially on lapse SCR and interest rate SCR. We will also discuss some of the risk management issues arising from the new situation and possible opportunities to relaunch new traditional products.

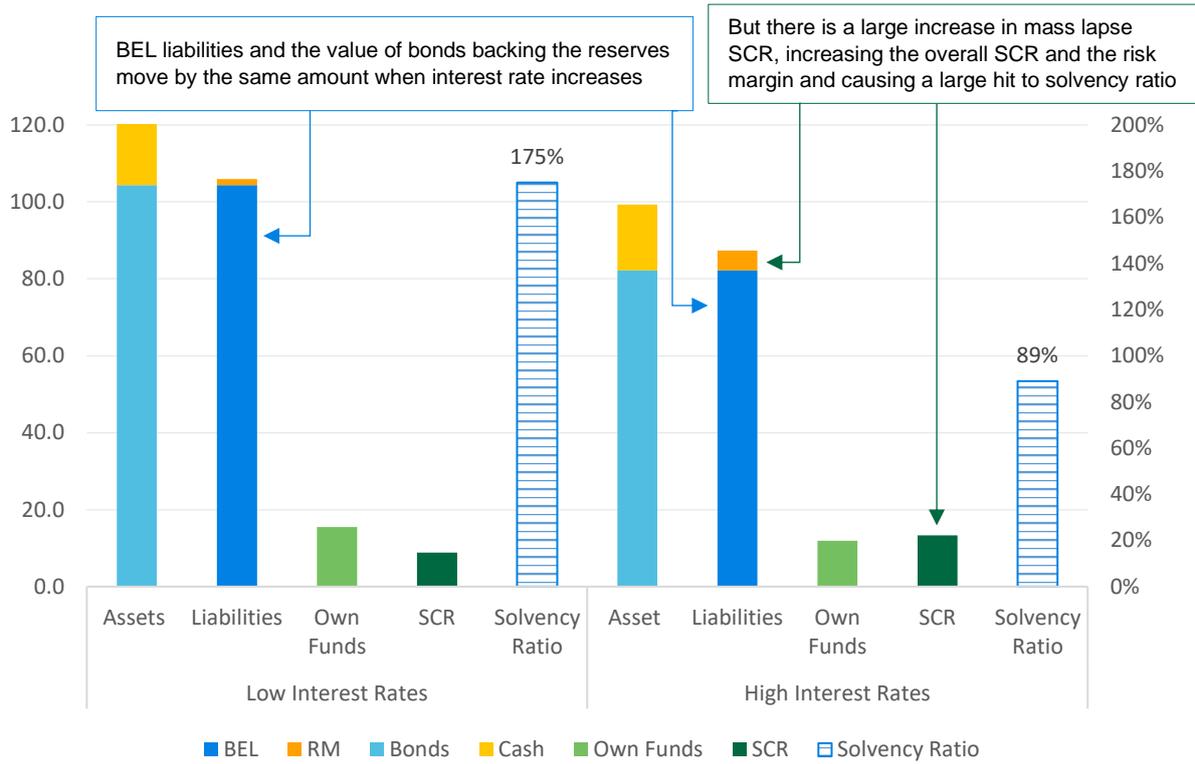
Impact on Solvency II position

Because any mismatch results in an SCR charge for interest rates, Solvency II tends to incentivise a good matching of assets and liabilities by duration, it might be thought the impact on solvency ratios could be limited unless the company has “bet” a priori on which way rates will move. However, things are not always that simple.

If a company was well matched by sensitivity to interest rates, then the interest rate movement will not necessarily have directly impacted the Own Funds very much because BEL and the market value of assets may have moved in parallel. However, there could be other knock-on effects on the solvency position. Consider, for example, the SCR for lapse risk. Traditional participating products often feature a double asset-liability management (ALM) risk, where there is a long-term minimum guarantee and a continuous liquidity guarantee through a surrender value based on the mathematical reserve. When rates increase, this continuous liquidity guarantee becomes more onerous and the risk of increased lapsation is higher. Under the Solvency II Standard Formula this is captured by the lapse up and, particularly, the mass lapse stresses.

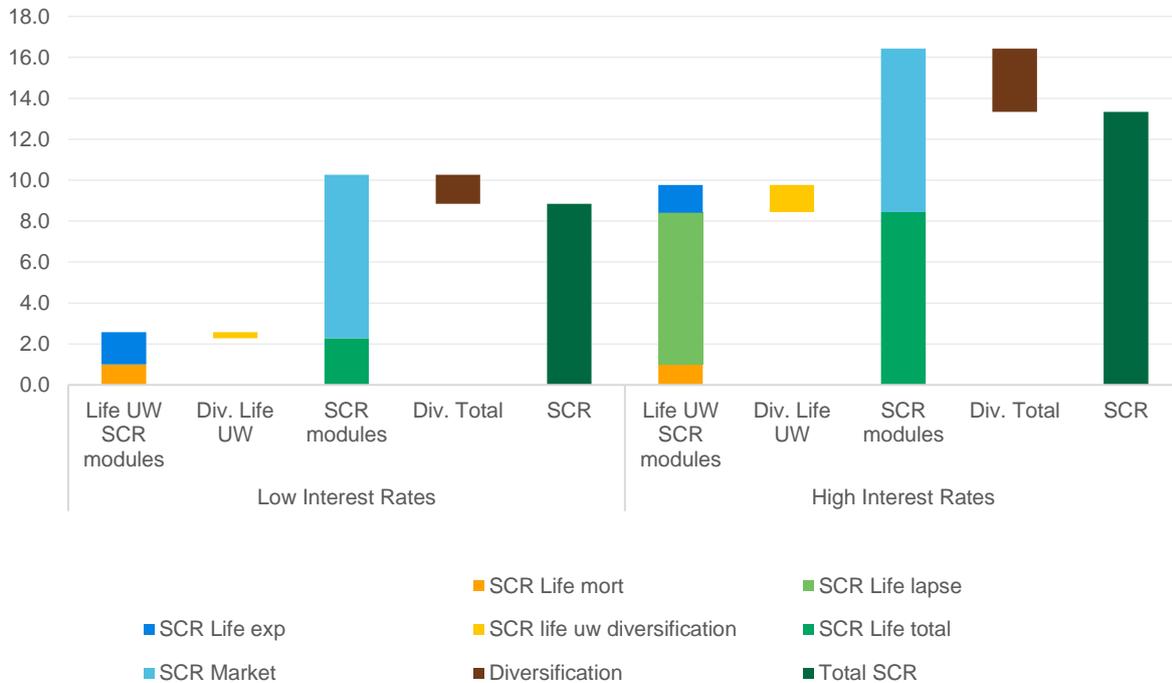
If the expected BEL cash flows were well matched and assuming that under a low interest rate environment the BEL and mathematical reserve were the same and the surrender value equals the mathematical reserve, then the mass lapse shock might be low or zero. When interest rates move up materially, mathematical reserves can significantly exceed both BEL and the value of the assets (which now have unrealised losses), and a mass lapse shock under which 40% of policyholders lapse to take a surrender value equal to the mathematical reserve is now very costly. This is illustrated in Figure 3.

FIGURE 3: ILLUSTRATIVE IMPACT OF INCREASED MASS LAPSE SCR ON A SOLVENCY POSITION



In Figure 4 we further show how the increase in SCR lapse drives a higher non-hedgeable SCR (and hence risk margin) as well as a higher overall SCR.

FIGURE 4: ILLUSTRATIVE IMPACT OF INCREASED MASS LAPSE SCR ON THE STRUCTURE OF SCR



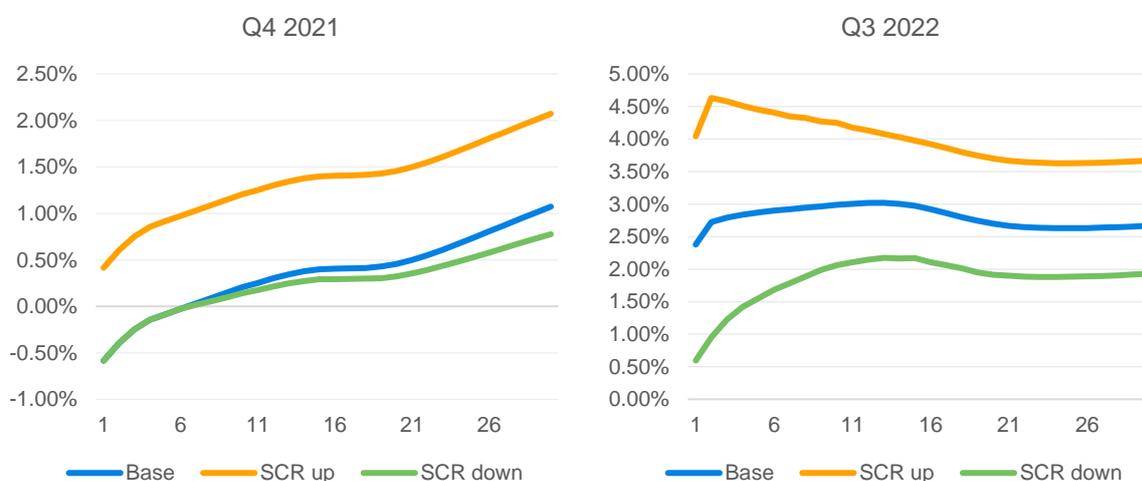
Of course, this illustration is of a company with severe exposure to lapse risk, but we have seen several European companies where exactly this effect has had a very material impact on solvency ratios. In Poland, where material interest rate increases were already seen in 2021, some companies noticed their dominating lapse risk becoming mass lapse instead of lapse down, even if it had not yet been associated with massive SCR increases like the one displayed above. The nature of the double guarantees in traditional participating products makes this risk hard to hedge against. At a minimum, a more sophisticated ALM approach considering not just the deterministic lapse rates but also the impact of alternative scenarios on the ALM position may be appropriate.

If the company is well matched, the interest rate SCR should be small both before and after interest rates rise. Note however that it is not always the case that companies are fully matched for different reasons—for example, lack of suitable financial instruments in certain markets. In such cases the companies could observe significant increases in the SCR charge for interest rates for two reasons:

- EIOPA essentially calculates the shocked curve by applying the factor rather than the spread method. It means that when interest rates are higher, the shocks are proportionally similar but are higher in terms of absolute difference.
- While for the upward shift the nominal size of the shock has to be at least 1 percentage point, the downward shock could be allowed to be nominally very small, if the base interest rate level was low. In our experience, CEE life companies, particularly those with material amounts of traditional business, will more often be exposed to the interest rate down shock. If not well matched they could see substantial SCR interest rate increases because with growing interest rates the same relative downward shocks will mean higher nominal shifts.

In Figure 5 we compare the EIOPA EUR base curve and shocked curves, at the end of Q4 2021 and at the end of Q3 2022. One can see that the downward shock for EUR for Q4 2021 was very small, while for Q3 2022 it is already materially higher due to the increases of interest rates.

FIGURE 5: COMPARISON OF EIOPA CURVES (BASE WITHOUT VOLATILITY ADJUSTMENT AND INTEREST RATE SHOCKS) FOR EUR FOR Q4 2021 (BEFORE RISE OF INTEREST RATES) AND Q3 2022



Some types of companies may have seen a reduction in Own Funds for other reasons. For example, companies with a lot of Own Funds coming from the value of in-force (i.e., future statutory profits of in-force business) may see their value fall due to a combination of:

- Higher discounting
- Reduced asset values in the case of unit-linked business, leading to lower future management charges
- Higher expectations for inflation leading to a higher BEL for expenses

Old ALM issues we thought were dormant can come back to life

Many insurers have old blocks of endowment and other participating products in force, which were written many years ago when interest rates were much higher and guarantees deeply in-the-money. This allowed companies to treat these guarantees as effectively fixed liabilities, making the time value of financial options and guarantees (TVFOG) small enough to ignore or to treat in an approximate way. The new interest rate environment may bring guarantees closer to the money or even out of it, which is bound to make TVFOG more material.

Some people might find this counterintuitive but TVFOG arises because of asymmetries between outcomes for the company under different economic scenarios. Participating products with minimum return guarantees create such asymmetries because when investment returns are high the benefits are shared with the policyholders, but when they are low or negative the company still has to pay the minimum guarantee. When interest rates are very low and guarantees are deeply in-the-money, then even higher return scenarios may not lead to profit sharing (as they just make the guarantees less in-the-money) and hence there is little or no asymmetry across scenarios. On the other hand, when interest rates become very high and guarantees are deeply out-of-the-money, the TVFOG is again very low because only a limited number of economic scenarios will lead to returns below interest rate guarantees. When guarantees are much below the level of interest rates, they can be quite cheap and the risk profile of such products starts to resemble the risk profile of an analogous product without any guarantees. It is the at-the-money case (interest rates close to the level of interest rate guarantees) when asymmetries are most material and the TVFOGs are at their highest.

In the box on the next page, we illustrate the dependency of the TVFOG on the in-the-moneyness of the guarantee with an analogy to the value of an interest rate caplet.

Understanding the stochastic value of the guarantees and how it will react under market stresses becomes important for ALM and risk management and also for financial reporting. Not all companies are well equipped to do this, particularly if guarantees are historical and recent product strategy has focussed on risk business and unit-linked products.

Another risk which may require greater focus is that of increased lapses for products with guarantees. The phenomenon that additional lapses may occur when market interest rates exceed the crediting rates on existing business (i.e., minimum guarantee plus profit participation) has been anticipated, but so far has never been experienced as interest rates were steadily decreasing in most CEE countries. This risk was considered distant and a significant amount of unrealised gains on government bonds made some companies think they are immune to the risk of increased lapses. In fact, if anything companies have become worried about lapse rates falling, making long-term guarantees more onerous.

The “new” interest rate environment turned unrealised gains into unrealised losses. At the same time there is much more of a de facto case to expect increased lapsation because under some circumstances it can be in the policyholder’s interests. For increased lapses to occur we do not need to suppose that the policyholders are financial economists capable of calculating the value of the options they hold and exercising them rationally. Lapses can also occur from “pull factors” like offers from alternative financial products with attractive interest rates, which can cause clients to liquidate existing savings instruments. Agents and financial advisers may also look to earn commissions by suggesting to their clients that they should surrender and buy an alternative product with higher guarantees and/or return expectations.

Companies are faced with two interrelated issues: how much will lapses increase due to the changed economic environment and how much do they expect their clients to react to future changes in interest rates. Solvency II and other market-consistent frameworks require that lapses are projected on a dynamic basis when policyholder behaviour is expected to be materially different according to some economic (or other) factor. This is typically modelled by having policyholder behaviour rules in a model which will depend on financial variables. For example, in scenarios where interest rates revert to lower levels lapses might be expected to decrease, and in scenarios in which interest rates increase even further the level of lapses might further increase. It is often assumed that such dependencies are nonlinear, because clients may be unreactive to a small movement in an economic variable, but very reactive to a large one. Similar issues can apply to related policyholder behaviour issues such as options to annuitise or extend duration.

Explanation of TVFOG with an analogy to interest rate caplet

To illustrate the pattern in which time value of financial options and guarantees (TVFOG) changes depending on the level of interest rates, it is useful to understand how the time value would evolve for a typical interest rate derivative like a caplet with a fixed strike of 3%. Let's assume our caplet has a nominal amount of EUR 1,000, a maturity of three years and is written on a six-month interest rates basis (caplets are typically written on interest rates with tenors shorter than one year). Then after three years the payout of such caplet is defined as follows:

$$V_3 = \begin{cases} 1,000 \cdot (r - 3\%) & \text{if } r > 3\% \\ 0 & \text{if } r \leq 3\% \end{cases}$$

where r is the settled interest rate.

A caplet is an interest rate derivative which is somehow similar to a profit-sharing mechanism embedded in insurance contracts. The strike of such an option can be compared to the interest rate guarantee. The settled interest rate is an analogue of the investment return: policyholders get extra return whenever investment returns exceed an interest rate guarantee, while profit sharing is zero whenever investment returns are smaller than the interest rate guarantee (for the purpose of this illustration we neglect additional parameters of profit-sharing formulae like fixed margins).

Assuming for simplicity constant interest rates, the intrinsic value of such an option can be calculated as

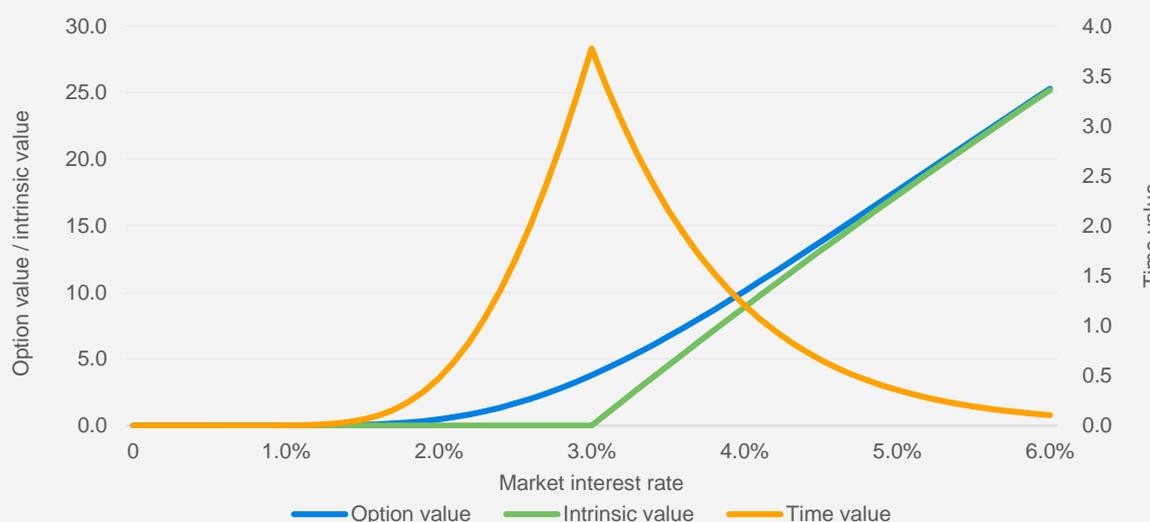
$$V_0^{(int)} = N \cdot (r_0 - K)_+ = 1,000 \cdot (r_0 - 3\%)_+,$$

where r_0 is the market interest rate at valuation date, while the value of an option $\cdot V_0$ can be calculated from the Black formula, although it is beyond the scope of this article to go into the details. The time value of such option is calculated as

$$TVO_0 = V_0 - V_0^{(int)}$$

In fact, it is a full analogy to the time value of financial options and guarantees for insurance contracts, which is calculated as a difference between stochastic and certainty-equivalent value. In Figure 6 we present how the value of the option, the intrinsic value of the option and the time value of the caplet evolve with interest rates.

FIGURE 6: OPTION VALUE, INTRINSIC OPTION VALUE AND TIME VALUE FOR AN INTEREST RATE CAPLET



Thus, the time value of an option is the highest when market interest rate is equal to the strike of an option, and it decreases quite rapidly when the option becomes both in-the-money and out-of-the-money. The behaviour of the time value of financial options and guarantees is similar: it is the highest when the interest rate guarantee is at the money (ATM) and sharply decreases when interest rates move away from the ATM point. In reality, for insurance contracts the time value could behave more smoothly, as typically insurance portfolios contain a wide range of interest rate guarantees. Nevertheless the idea is roughly the same.

Such examples are very appealing and easy to construct for very specific payoffs which can be valued with closed form formulae. In reality, in life insurance typically it is not possible to use closed form formulae, as the payoff is much more complex, and typically Monte Carlo simulation is the only approach which can be applied in practice.

There may be challenges in using past historical data to set genuinely best estimate lapse assumptions. For example, if a company has had an approach of smoothing statistical experience over, say, five years to get a reasonable midterm lapse rate, should it modify that approach to give more weight to the most recent experience if there is clear evidence of a change in lapse behaviour? Setting dynamic lapse assumptions can be even more challenging because the historical data typically does not contain any periods with significant interest rate rises, thus statistical analyses of it are arguably irrelevant in understanding how clients may react in the new situation. The use of expert judgement usually plays a key role in setting such assumptions. Actuaries usually feel more comfortable depending on past statistics than in exercising “subjective” expert judgement, but of course there is material hidden subjective judgement in assuming that past statistics are necessarily relevant for predicting the future.

New opportunities with participating products

Product strategy may also be affected and there may be an opportunity due to the current situation. In fact, higher interest rates may give a chance for companies to relaunch participating products like endowments with minimum guarantees and profit sharing, hopefully whilst avoiding some of the problems seen in the past. In several CEE countries the sale of such products has declined greatly over the last 10 years because low nominal interest rates made the potential returns unattractive. Instead, companies tried to promote unit-linked and risk business.

The higher interest rate conditions should make it possible once again to design attractive participating products, but this is unlikely to mean simply dusting off the products of 10 years ago and putting them back on sale. Instead, a rethink of these products may be needed for issues such as:

- How to provide good long-term customer value and suitable protection against inflation whilst adequately rewarding distributors
- How to limit risk exposures by redesigning guarantees so that capital requirements are reasonable
- How to address the issue of guarantees on the ALM side so that companies do not find themselves with new problems should interest rates move again

In some other European markets, e.g., Italy and France, a lot of work has already been done on rethinking participating products to meet these challenges. There has been a recognition that some product features that historically were offered to the policyholder almost automatically can create very costly embedded options, which have an important impact on product profitability. Any assessment of the impact on new products needs to properly capture the impact on the capital requirements of the company. The days of doing simple standalone liability-only profit tests for participating products should be gone.

Of course, if clients or distributors are asked the question, “Do customers want continuously guaranteed surrender values?” without mentioning any adverse consequences from saying yes, then everyone will say yes. If on the other hand the question is changed to, “Would you prefer a product with continuously guaranteed surrender values to one with weaker guarantees on surrender, but higher long-term guarantees and/or lower charges and/or a more aggressive investment mix creating an expectation of higher returns?” then the answer might be different. Some clients might be unconcerned with short-term liquidity on a product and more interested in long-term guarantees and returns. The historical approach of having “one size fits all” is no longer appropriate.

A first step in this development has been to remove the consolidation of credited returns, historically an almost universal feature of these products, but now less common in some markets. Historically, in continental Europe it was typically the case that once profit sharing had been declared it could not be taken away and hence was “consolidated.” However, products have started to be introduced where this feature is removed, i.e., if a return in excess of the minimum guarantee led to profit participation, but this was then followed by a negative return, it could be used to reduce the profit sharing already given.

A step further which has been seen on several products is removing the continuous guarantee on surrender at all times, but only having a guarantee at maturity or at certain defined dates. These features seen in products launched in the last few years in Italy follow approaches already taken in the UK significantly earlier, and can massively improve capital efficiency. This type of logic could also be applied in CEE. Hybrid products containing both unit-linked and participating features could also be an interesting solution to study.

How can Milliman help?

Milliman has deep experience in helping insurers deal with the types of challenges and opportunities we describe above and other related ones. We combine a strong technical understanding, in-depth local knowledge, and strategic vision to help companies achieve the best possible outcomes. We intervene in areas from risk management and ALM to new product strategy. Examples of the areas in which we assist companies to meet the challenges described in this article are:

- Assessment of financial and other related risks
- Calculation of TVFOG without huge implementation costs
- Studies to optimise ALM and management actions
- Help in setting best estimate and dynamic assumptions, including benchmarking to assist in exercising expert judgement
- Development of new participating products considering ALM aspects in a robust way

We also have market-leading tools which support our consulting work and help clients manage these issues.

Please reach out to the authors or your local Milliman consultant if you have any questions on this paper.



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