Institute of Actuaries of India

Subject SA2 – Life Insurance

March 2018 Examination

INDICATIVE SOLUTION

Introduction

The indicative solution has been written by the Examiners with the aim of helping candidates. The solutions given are only indicative. It is realized that there could be other points as valid answers and examiner have given credit for any alternative approach or interpretation which they consider to be reasonable.

Solution 1:

i) According to the IRDAI's Circular on Guidelines on Interest Rate Derivatives, the Board approved risk management policy governing investments in financial derivatives by life insurance companies should cover the following:

1) Insurer's overall appetite for taking risk, ensuring that it is consistent with its strategic objectives, capital strength etc.;
2) To define the approved derivative products and the authorized derivative activities;
3) To provide for sufficient staff resources and other resources to enable the approved derivatives activities to be conducted in a prudent manner;
4) To ensure appropriate structure and staffing for the key risk control functions;
5) To establish management responsibilities;
6) To identify the various types of risk faced by the insurer and establish a clear comprehensive set of limits to control these;
7) To establish risk measurement methodologies which are consistent with the nature and scale of the derivative activities;
8) To require stress testing of risk positions;
9) To detail the type and frequency of reports which are to be made to the Board (or committees of the Board);
10) The applicable VaR limits;
11) Circumstances for termination and closure of the contract;
12) Accounting treatment of the proposed derivatives in the company; and
13) Solvency / capital impact due to the use of derivatives.

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ii) The basic investment principle to be followed when establishing the appropriate investment strategy is to maximize the investment returns for the Company, subject to meeting all contractual obligations and fulfilling obligations to treat customers fairly (TCF); recognizing the uncertainties involved; and the overall risks that the shareholders, regulators and policyholders are prepared to tolerate.

The closer the Company matches its liabilities with assets of similar terms, amounts, types (including risk exposures) and currencies, the more likely it will be able to meet its contractual liabilities as they fall due. In doing so, judicious ALM requires that matching not only ensures that there is enough money in total to meet liabilities but that cash-flows are such that money is available at the right time.

With regards to the specific case provided, the following may needs to be considered:

- We are considering a newly launched portfolio – and hence the investment strategy needs to consider predominantly how "new monies" received from new business premiums as well as renewal premiums of recently sold policies should be invested. As such, the investment strategy needs to have a greater focus on management of new cash-flows as opposed to potential re-deployment of existing assets.

- The investment strategy needs to be established with respect to non-participating savings products. From an ALM perspective, these products would typically involve single or (more commonly) limited /regular premium payment terms, with premiums received over a specified period of time and providing a fixed guaranteed return, with neither upside nor downside potential from the policyholder's perspective. The survival pay-outs may be in the form of a lump-sum or regular payouts at a specified frequency and over a specified time period, typically determined at the onset of the contract itself. Hence, the key consideration would be to ensure that investment strategy allows for (re)investments of current and future premiums so as to meet the guaranteed returns to the policyholder. Given the 'guarantee' nature of the contract, the amount and timing of these liability cash-flows would largely be known at the outset (subject to decrements as described below).
- In addition to the primary benefits as described above, there may be other liability cash-flows to consider, in particular with respect to any guaranteed or special surrender values available at various durations and customer propensity to surrender; death benefit payable and the need to meet ongoing expenses of management.
- We also need to consider the current economic environment in India which can be briefly characterized as follows: the current 10-year government bond yields hover in the range of 7% to 8%, with a largely flat (or slightly upward sloping yield curve); there is relative paucity of readily available securities at longer durations (e.g. bonds of more than 30 years tenor); a relatively underdeveloped but growing corporate bond market with a very wide spectrum of corporate entities raising debt capital with varying degrees of repayment ability; a buoyant (but volatile) equity market with long term returns expectations ranging from 10% - 12% or more; and a reasonably deep and liquid money market.

- With the above factors in mind, a reasonable investment strategy could be specified as follows:
- To only invest premium proceeds (net of commissions) in the currency of the underlying contract – presumably all in INR in the current case;
- The key risk is to ensure that future premiums and incomes are (re)invested at appropriate yields so as to meet the guaranteed benefits. Hence the Company could consider getting into derivative contracts such as forward rate arrangements with suitably well-established counterparties, so as to hedge some of the risk of reducing interest rates in the short/medium term. Another alternative to managing this risk may be to arrange for investment in the institutional recurring deposits at an agreed pre-determined rate if these are available;
- Given the (largely known) maturity / survival payouts, the Company should consider making the bulk of its investments in fixed interest securities that closely match the maturity proceeds from such securities with the expected liability payouts. These may be a combination of government bonds (at least to meet the minimum regulatory thresholds) and a portfolio of carefully selected corporate bonds that may provide a higher expected return (albeit at a greater risk of default). Given the default risk on the corporate bonds, selection of the bond issuer would need to be carried out carefully. The term structure of these fixed interest assets would need to be such that it matches the liability cash-flow profile insofar as the required tenors are available. This would ensure a reasonable degree of matching in respect of both "nature" and "timing" of the assets and liabilities;

- There may be a need to have certain shorter duration fixed interest investments. These may be required to ensure that the Company is able to meet any expected surrender payouts.
- A small proportion of assets may also be invested in money market instruments to meet the day-to-day financing needs and ongoing expenses of management.

Based on the above investment strategy, it may be possible to construct a portfolio of reasonably well matched asset-liability position particularly if the liability cash-flows are not significantly long dated.
However, considering the current equity returns outlook, the Company may choose to investment a certain (limited) proportion of assets in equities as well to benefit from the higher expected long term returns. However, it should be noted that this exposes the Company to volatility risk and therefore equity exposure should be limited and carefully considered against the Company's risk appetite.

Direct property as an asset class for investments backing such a non-participating savings business may well be avoided, due to the relative illiquidity of the property investments; indivisibility of holdings (such that parts of the property may not be sold, if required); and uncertainly as to whether property investments would materially outperform equities in the current economic environment.

When setting the overall investment strategy based on matching of assets and liabilities as described above, we may need to allow for a degree of flexibility in the set investment limits by specifying them as a range rather than a fixed proportion target. This could potentially give a degree of investment freedom to the investment manager to take advantage of short term positions to maximize returns based on active investment management. [12]

iii) An ALM study focused on duration matching has the following advantages:

- It is relatively simpler to establish, execute, monitor and communicate than cash-flow matching;
- Allows for greater flexibility in terms of choice of specific asset tenors for investment – as long as overall portfolio duration is well matched;
- Readily lends itself to immunization against small changes in interest rates for a well-matched portfolio.
- However, relying solely on duration matching suffers from the following drawbacks:
- Particularly for new business, where premium incomes in initial years exceed outgoes, the net cash-flow may be a "net income" in initial years followed by "net outgo" in later years. This may result in a string of "positive" and "negative" cash-flows, in which case the mathematical measure of McCauley duration will not result in reliable answers (or may well not exist!)
- Duration matching alone could provide a false sense of security, particularly in case asset proceeds are not available at the right time to meet the liability outgoes – even if at a portfolio level, the overall durations of assets and liabilities are well matched.

- It is relatively more difficult to assess sensitivities and scenarios to study alternative investment strategies, particularly in cases where we want to analyse impacts of management actions (such as changes in the surrender value scales) or interlinkages between market environment and liability cash-flows (such as low interest rates leading to low policy surrenders in a non-participating savings product).

On the contrary, in the case of cash-flow matching:

• One would typically require a more sophisticated cash-flow projection model for both assets and liabilities – either deterministic or stochastic – than that required for assessing duration matching;

• A further disadvantage of cash-flow matching may be that assets that fully mirror liability cash-flows may not exist and hence, invariably cash-flow matching would lead to compromise solutions and may not be achievable in practice;

• However, the advantage of cash-flow matching is that once achieved, duration matching would already be implied / subsumed within the proposed matched position.

Hence, preferably, in undertaking the ALM study, one may consider establishing appropriate checks and monitoring mechanisms for both cash-flow and duration matching without relying exclusively on just one method.

[5]

iv) Stochastic modelling can be used to help determine and test management rules for asset-liability matching and to enable advance planning for changes in conditions or strategies. The steps involved in undertaking an ALM study involving a stochastic asset-liability model could be summarized as follows:

i. Develop a liability cash-flow projection model to project all cash-flows on a year by year (or potentially month by month – though that may not necessarily be tenable in the context of an ALM exercise) for a number of years (or potentially the entire lifetime of the policy).

ii. All material and relevant features of the product should be captured in the liability cash-flow models, in particular relating to premium income and expected outgoes on death, surrender or survival / maturity as well as the commission and other expense outgo. It may be necessary to decide on the level of details to incorporate in the projection, in particular, if such details are either not critical or do not contribute materially to the outcomes. This may include decisions on matters such as modelling for free-looks cancellations, various policy options / features that may be offered but are less material, possible future paid-ups etc. However, whilst doing so, one should carefully assess each of these in the context of the ALM exercise and consider whether or not it is appropriate to include the same in the projections.

iii. Select appropriate representative model points – both in respect of expected future new business (given recently launched products) and existing business. Alternatively, explore whether the computing capabilities allow for portfolio level projections, in which case assumption of model points may be required only for modelling cash-flows in respect of future new business.

iv. Establish appropriate assumptions – these may include projection assumptions such as expected future mortality rates, premium and policy discontinuance rates, expected unit expenses and inflation and other related projection assumptions. Typically, for ALM purposes, these may be 'best estimate' assumptions for projecting best estimate liability cash-flows. Alongside projecting the cash-flows (in respect of incomes and outgoes), one may also project the expected build-up and release of statutory reserves to provide an indication of the amount of assets required to be invested in any given year to back the statutory liability in the future.

v. There would be a separate model for producing the investment returns on various assets, the results of which would feed into the liability projection model. An alternative methodology is to build an asset projection model where cash-flows from individual assets modelled. This level of sophistication may improve the understanding of the results but the extra complication of combining the asset model with the liability model may result in increased risk of errors, including assumption errors – which should be closely monitored (and checked).

vi. Build interlinkages between the models for asset and liability cash-flow projections – in particular with regards to "buy/sell decisions" for investments in various assets. For example, in the initial years, the premium incomes in excess of immediate outgoes during the year would be used to "buy" appropriate assets based on the chosen investment strategy. These assets would then be accumulated with ongoing asset cash-flows (e.g. coupons in a fixed interest security) being (re)invested as well as with investment of future renewal premium incomes. Eventually, "just enough" assets may be "sold" so as to pay the liability cash-flows due in later years.

vii. Rules may also be required on which asset types to be sold (when required), asset re-balancing strategy and frequency. Further "rules" may also be necessary to vary buy/sell decisions under specific investment scenarios to test alternative investment strategies.

viii. Simulate projections of both assets and liability cash-flows for a number of stochastic scenarios. These stochastic scenarios would typically be based on output from an economic scenario generator (ESG). This is a model that produces numerous simulations of possible future economic outcomes which are then used as inputs to develop the asset returns.

ix. ESGs would typically output macroeconomic variables such as nominal and real interest rates and inflation, and also simulations of asset returns for classes such as equities, commercial property and corporate bonds of different credit ratings.

x. Given the current exercise is to assess appropriate ALM strategy, a "real world" ESG would typically be used. A real world calibration determines the model parameters using "real world" economic expectations of the future. The model can then be used to calculate probabilities and confidence intervals for the outputs, e.g. the probability that the value of the assets is less than the value of the liabilities at some point within the next 20 years.

xi. Based on the stochastic simulations, test for multiple investment strategies and choose the investment strategy that optimizes the risk/return across the scenarios – i.e. one that produced that higher amount of return for the lowest probability of shortfall under tail scenarios.

xii. As well as performing stochastic modelling, time zero tests can also be used in order to assess immediate risks to which the Company is exposed. With these tests, it is important to remember that risk exposures may change significantly over time as both assets and liabilities mature.

xiii. Alongside a "baseline" investigation, it is also important to undertake various sensitivity and scenario analysis on changes to key assumptions. Given the economic model is already stochastic, such sensitivities are likely to be focused on impact of changes in key operating and demographic assumptions.

xiv. Finally, assess limitations in the models and any shortcomings in the results. These should be appropriately documented as well as communicated so that all stakeholders are aware of these when making decisions based on the outcome of the ALM exercise.

[14]

v) In the current context of the non-participating savings product and the mandated investment strategy comprising a combination of long dated fixed interest securities, money market instruments, equities and forward rate arrangements, the key assumption for statutory valuation purposes is likely to be the choice of valuation rate of interest (VROI), the persistency assumption and the expense assumption.

Key considerations to be adopted in deriving the VROI are set out below:

- As a starting point, consider the "locked in" yields of existing long dated fixed interest assets, and the extent to which they are expected to be held to maturity (as opposed to being traded or available for sale).
- Allow for expected future (re)investments, in particular whilst recognizing the risk of a decline in the future interest rates, as required by the IRDA (ALSM) Regulations, 2016.
- Assess a 'best estimate' "portfolio yield" based on a weighted average of existing assets and existing yields as well as expected "new money" investments based on the investment strategy of the Company. Alternatively, the "portfolio yield" could be derived as an internal rate of return (IRR), by equating the current assets with future net cash-flows (i.e. net liability cash-flow as well as future investment / redemption of asset proceeds).
- The valuation rate of interest should be risk adjusted and based on prudent assessments of the yields. Hence, particular care is needed in respect of investments in equities and forward rate arrangements.
    - With regards to equities, consider whether any risk premium should be allowed for in the derivation of the valuation interest rate or is it more appropriate to assume that any excess expected return on equities is compensated by the higher risk they are exposed to; therefore a "risk adjusted" return may be taken as equivalent to the return on risk-free assets.

- Similarly, in respect of the forward rate arrangements, consider the extent to which these provide protection against a decline in the future interest rates (and the degree to which this protection should be incorporated in the derivation of the valuation rate of interest) as well as any additional risks introduced – in particular the basis risk and counterparty risks inherent in such derivative investments.

• Finally, allow for appropriate margins for adverse deviations (MADs) as required by the requirements of the Actuarial Practice Standards 7 (APS7) to derive the prudent valuation rate of interest for statutory valuation purposes. In setting such MADs, careful consideration may be needed to the extent to which we can take credit for the protection accorded by the forward rate agreement in an adverse interest rate scenario.

• Whilst setting the MADs to be used in the derivation of VROI, the Appointed Actuary is required to construct adverse scenarios as per the requirements of APS7. The APS7 requires that whilst constructing such adverse scenarios, the Appointed Actuary must consider all such options wherein the policyholders would act rationally to maximize their interest to the detriment of shareholders. In non-participating savings contracts, one such option is policy discontinuance or surrender.

• Given this, whilst deciding on the adverse interest scenario to set the MADs in VROI, the Appointed Actuary should also consider whether or not the policyholders' behavior would also change in such a scenario (e.g. a lower investment return making the guarantees in the non-participating savings contract more valuable, thereby resulting in less policyholders' discontinuing their policies).

The other methodology and assumption considerations are likely to remain similar to those for any other non-participating product. Specifically, these would include:

• Adopting a gross premium valuation (GPV) methodology and calculating the reserves on a seriatim basis;

• The calculated reserves are subjected to a minimum floor of the surrender values offered under the contacts;

• Considering all future decrements – such as mortality, lapses and surrenders, reduced paid-ups; as well as revivals and providing for appropriate levels of margins for prudence (in line with the requirements of APS7) whilst setting these parameters;

• Allowing for future maintenance expenses expected to be incurred (with a MAD in line with the requirements of APS7), allowing for appropriate levels of inflation. Should the assumption result into a maintenance expense overrun, the Appointed Actuary should provide additional reserves for the same;

• Not considering any savings in future commissions not payable to the distributor of a given policy;

• Setting aside additional reserves to meet any strain arising on revival of lapsed / surrendered policies as well as for any incurred but not reported (IBNR) claims.

[12]

[50 Marks]

Solution 2:

i) The suitability and limitations of the current reserving methodology are discussed in the following paragraphs.

Suitability

The Company currently sets aside the historically deducted investment guarantee charges, accumulated at 8% p.a. as investment guarantee reserves. Although it would be more appropriate to assess investment guarantee reserves using stochastic techniques, a simplified deterministic approach using investment guarantee charges as a proxy may be reasonable, taking into account the fact that this is a small block and closed to new business.

Investment guarantee charge could be a good proxy to the cost of guarantees. Normally, this charge would have been set at the time of pricing to cover the expected cost of guarantee and possibly additional loadings for profits and incremental costs of capital. It would be useful to refer to the product pricing documentation and assess how the investment guarantee charge was set. If it is determined that the calibration of the investment guarantee charge was actuarially appropriate (allowing for the changes in the investment conditions from pricing until the valuation date), then using this charge for the purpose of setting reserves may be reasonable.

The actual fund performance of the underlying funds should be assessed vis-à-vis the expectation at the time of pricing. If the actual fund performance was broadly aligned to the investment returns priced for, then the investment guarantee charge may be a good proxy to the cost of guarantee. On the other hand, if the actual fund performance has been favorable relative to the investment returns priced for, then the reserves based on the accumulated guarantee charges could be more prudent relative to that based on a stochastic assessment.

If the Company does not have any other unit-linked products with guarantees, then it may not want to develop and maintain full-blown stochastic models for ascertaining the cost of guarantees. Under such circumstances, it may be reasonable to use deterministic approaches provided there is an adequacy test performed periodically to ensure that the reserves using deterministic approaches are not less than those calculated using stochastic techniques.

The reserving approach may lead to earnings volatility around the policy maturities depending on the actual cost of guarantee (i.e. fund value at maturity vs. the single premium) compares to the investment guarantee charges collected. However, the in force policies still have 8 to 10 years to go before maturity. Therefore, the current methodology may be appropriate for now but would need to be refined in the future.

Limitations

If the investment guarantee charge at the time of pricing was calibrated stochastically on a best estimate basis (i.e. CTE 0 of stochastic simulations) without additional loadings for profit or cost of capital, then using the accumulated cost of guarantee charges for reserving may not be adequately prudent.

The current methodology is deterministic in nature. Although the block is small and therefore this approach may be reasonable on the grounds of materiality, the Company would need to assess the adequacy of the reserves using stochastic approaches from time to time as these are more appropriate for setting the investment guarantee reserves. This is also a requirement as per Guidance Note 22 (GN22).

In theory, the cost of guarantees is negatively correlated with the fund performance. When the underlying funds do not perform well, the Company may need to strengthen the investment guarantee reserves and vice versa. However, the current methodology results in investment guarantee reserves being positively correlated with the fund performance. As such, if the actual investment returns are very high or very low, then the current reserving methodology may no longer be reasonable. This is especially true if the actual investment returns are quite low – in such instances, stochastic analyses would likely indicate strengthening of reserves.

The current methodology may result in earnings volatility around maturity. Whilst the investment guarantee charge may have been calibrated as an average across many economic scenarios, the actual cost of guarantee at maturity will depend on the actual fund performance. If the actual fund performance has been robust, then there may be a significant release of guarantee reserves at maturity. On the other hand, if the actual fund performance has been relatively poor, then the investment guarantee reserves may be inadequate to fund the cost of guarantee, causing a statutory strain at that time.

The current methodology does not appropriately take into account decrements such as mortality or withdrawals. It would be appropriate to release investment guarantee reserves when the policies cease to be in force e.g. upon death or surrender. However, since the reserves are simply the accumulation of historical investment guarantee charges, such release is not allowed for. [11]

ii) Withdrawal surplus arises due to surrender values being lower than the asset shares of the surrendering policies.

It may be reasonable to retain such surplus in the participating fund estate, when the amount of such surplus is small. However, over time, as the surplus becomes larger, the Company may need to consider ways in which such surplus can be distributed to the existing policyholders. Sustained under-distribution of surplus over a long period of time may be considered to be inequitable to the policyholders.

There are several actions the Company could undertake:

1) The Company can consider allocating the future withdrawal surplus to the asset shares of the continuing policyholders and distribute these through reversionary or terminal bonuses. If the withdrawal surplus is reasonably steady from one year to another, then distributing through reversionary bonuses may be appropriate. Otherwise, the Company could consider distributing partly through reversionary bonuses and partly through terminal bonuses; or even fully through terminal bonuses, if the surplus fluctuates significantly from one year to another.

2) It may be useful to analyze the withdrawal surplus by product or major product series. If the withdrawal surplus is attributable to a particular product or series, it would only be equitable to allocate such surplus to asset shares of the continuing policyholders of the same product or series. However, if the withdrawal surplus is more broad-based and does not vary significantly between products, then it may be justifiable to allocate this to the asset shares of all continuing policyholders.

3) If the Company is consistently generating large surpluses on account of lapses/surrenders, then there may be a possibility that the surrender values offered to the policyholders are low. The Company could perform further investigations into its surrender value scales for reasonableness. A market benchmarking relative to the surrender values offered by other insurers may prove to be helpful. If the Company decides to strengthen the surrender values offered to the policyholders, then the withdrawal surplus anticipated to emerge in the future will reduce. Accordingly, the Company may not need to make any changes to the bonus distribution philosophy in such a case.

4) In relation to the miscellaneous surplus arising from riders, it would be helpful to break this down by different riders offered to the policyholders. If it is identified that the surplus is largely arising from one or two riders, then the Company may consider re-pricing these riders, making them more competitive. This will reduce the surplus anticipated to emerge in the future (vis-à-vis if no re-pricing is carried out) and therefore the Company may not need to make any changes to the bonus distribution philosophy.

5) The Company may decide to allocate the surplus emerging from the riders to the asset shares of the remaining policyholders. The Company will need to form a view as to whether these should be allocated to all policyholders generally, or only to those policyholders who had bought such a rider. The former may be administratively easier; however, the latter may be more equitable.

6) If the rider premium rates for the riders are not guaranteed over the policy term, then it may be reasonable to perform morbidity experience investigations and reduce the premium rates charged to the policyholders, if justified by experience. Such an approach may be more practical than allocating the surplus emerging from the riders to the asset shares of the in-force policies and then distributing it away.

7) The Company may decide not to take any specific actions in relation to the withdrawal surplus or surplus attributable to riders. Instead, it may choose to have a broader, general approach to deal with growing participating fund estate by distributing it from time to time. For instance, the Company may adopt a philosophy that if the participating fund estate, as a proportion of the fund assets, exceeds a certain threshold level, then the excess be distributed to the policyholders through one-off reversionary bonuses at that time.

8) The Company may also need to review its bonus management framework holistically instead of considering only the withdrawal surplus and rider surplus. For example, if the Company continues to experience expense overruns and these are currently absorbed by the participating fund estate, then it may not be appropriate to re-allocate the withdrawal surplus to the asset shares, as doing so may result in the fund not being able to meet the expense overruns fully.

9) Finally, any changes in the bonus management framework may need to be in line with its policyholders' reasonable expectations (PRE). For example, if the Company's stated definition of PRE (based on which the policyholders' benefits have been illustrated and managed thus far) has been such that the withdrawal and rider surpluses are not shared with the policyholders, then distributing the existing estate amongst the currently in-force policyholders only may not be equitable. In such circumstances, the Company may be able to control the future surpluses surplus allocated to the estate through the actions discussed earlier, but it may not be appropriate to distribute the existing estate amongst the in-force policyholders.
10) If the Company decides to make any changes to the bonus management framework / asset share calculation approach, then these should first be brought to the 'With Profits Committee' for approval before such changes are implemented.

In respect of any changes (e.g. bonus philosophy, enhancement of the surrender values etc.), the Company should ensure that such changes are appropriately disclosed and communicated to the policyholders and the distributors.

[13]

iii) The three lines of defense is an accepted framework for implementing Enterprise Risk Management (ERM) in a life insurance company. It consists of the following:

First line: The first line of defense is the business operations. It is important to have a well-established control environment embedded in the daily operations of the business. Examples of this would include maker-checker-reviewer controls for various processes, approval matrices for large value transactions etc.

Second line: The second line of defense is the oversight functions e.g. a standalone risk management function in the Company, which typically report to the Board of the Company. These functions have the responsibility for the production, implementation and monitoring of risk management policies and practices throughout the Company. It is common for insurers to have a Chief Risk Officer who determines the company-wide risk management policies and ensures their adherence on a regular basis.

Third line: The third line of defense is the independent assurance providers. This would include both internal as well as external auditors. Audits can help to verify that the policies and procedures in place are being effectively implemented in practice. [6]

iv) Determining the valuation interest rate is governed by the IRDAI (ALSM) Regulations, 2016 and the APS-7 issued by the Institute of Actuaries of India.

Although single premium life annuities and regular premium savings products are both non-participating in nature, they are quite different in terms of the underlying investment risks. As such, this difference in the underlying investment risks gets reflected in the lower valuation interest rate for the regular premium non-participating savings products relative to the single premium life annuities.

Under single premium life annuities, policyholders receive an income for life in exchange for the lump sum premium paid at the outset. The premium amount, net of initial acquisition expenses, is available for investment immediately upon entering into the contract. In addition, the amount of initial expenses for the single premium annuities tend to be relatively lower compared to the regular premium savings products.

Typically, the Company would invest the single premium received from the annuity contract net of expenses, in fixed income assets, taking into account the liability profile of the contract.

Every year, the Company would receive coupons from the fixed income assets and would need to make annuity payments to the surviving policyholders. If the Company has implemented robust asset-liability management (ALM) techniques, it would look to minimize the net cash flows for reinvestments and thereby reduce the reinvestment risk.

Even if interest rates were to decline significantly in the future, it would have a limited impact on the overall investment returns on the assets backing the annuity contract. The impact would arise only to the extent of the reinvestment of the excess of coupon cash flows over annuity payments and maintenance expenses.

As such, this would enable the Appointed Actuary set a valuation interest rate that is based on the yields on existing fixed income assets, allowing a small margin for future reinvestment risk.

On the other hand, the regular premium non-participating savings products are an altogether different proposition. Under these products, the policyholders are entitled to receive guaranteed death and maturity benefits in exchange for periodic premiums.

Whilst the benefits are guaranteed at the outset, the corresponding backing assets are only gradually accumulated as premiums are received over time. This exposes the Company to a significant level of reinvestment risk, especially at the early policy durations.

If the interest rates were to decline in the future, then apart from the reinvestments of the coupons from already invested assets, the future premiums, net of expenses and benefit payments, would be invested at lower yields than anticipated at the outset. Since the maturity benefits are fully guaranteed, the impact of lower yields cannot be passed through to the policyholders (unlike in the case of the participating products) and the Company would have to absorb any losses in full.

It is appropriate to take this reinvestment risk into account for setting the valuation interest rates. The IRDAI (ALSM) Regulations, 2016 explicitly state that the risk of decline in the future interest rates should be taken into account in determining the valuation interest rate for the non-participating products. The APS-7 also sets out certain minimum adverse scenarios that should be considered for determining the valuation interest rates.

The CFO's comment arises in the context of high new business strain. The reinvestment risk in the regular premium non-participating savings products is greatest at early duration of a policy, since a vast majority of the premiums are yet to be received and invested. In addition, the initial expenses would typically be high and therefore the amount available for investment in the first year would generally be quite small.

Since the level of reinvestment risk is substantial, this would require the margin for adverse deviations (MADs) to be set prudently, thereby resulting in a lower valuation interest rate for the regular premium non-participating savings product.

The portfolio of the regular premium non-participating savings products is in its early years. Over time, as the premiums are received, the reinvestment risk exposure may reduce. This may enable the Appointed Actuary to consider reducing the margins in the valuation interest rates in the future.

The IRDAI permits the insurers to invest into derivatives to hedge the interest rate risks. The Company could explore establishing a hedging program to manage the interest rate risk. If such a program is put in place and can be demonstrated to be effective, then this could justify reducing the margins in the valuation interest rate in respect of the regular premium non-participating savings product.

[10]

v) The Company can consider various actions as set out below to ensure that an appropriate reinsurance arrangement is put in place for the future.

Reinsurance on the existing business

The Company should review the current reinsurance treaties.

If the reinsurance premium rates under the existing reinsurance treaties are non-guaranteed, then the Company can highlight the favorable mortality/morbidity experience to the reinsurers and negotiate a reduction in the reinsurance premium rates based on such favorable experience.

The Company should also examine if it is possible to fully or partly recapture the business previously reinsured, provided the reinsurance treaty so permits. Some reinsurance treaties permit such a recapture after the treaty has remained in force for a certain number of years. In such instances, the Company can recapture the business or increase the retention limits for future years, effectively retaining a greater share of mortality/morbidity profits in the future from existing business.

Reinsurance treaties often permit the insurer to recapture the business if the financial strength of the reinsurer deteriorates e.g. credit rating falling below a certain threshold. The Company should examine the financial strength of its reinsurers and see if the treaties contain clauses which can be invoked to initiate such a recapture.

If the Company has had amicable working relationship with the reinsurers over the years, it may be possible to extract concessions from reinsurers even on existing business. Such concessions can be in the form of a rate reduction or getting a small profit share even though the reinsurers are not contractually bound to offer such concessions.

However, the Company should be mindful that any increase in retention limits and / or recapture of the business would result into the Company's required solvency margin also increasing. Thus, the Company should analyse the impact any such changed terms would have on the solvency position of the Company before deciding on the changes to be implemented.

The Company may also negotiate other non-financial benefits that could be acquired from its reinsurers, including free periodic training to its underwriting / claims staff; IT tools to manage / streamline the reinsurance accounting etc.

Reinsurance on the future new business

It may be far easier to make changes to the reinsurance arrangements for future new business than to the existing business.

The Company should first assess its risk appetite as it relates to the mortality and morbidity risks. It is possible that over the years, the Company has developed strong underwriting and claims expertise. As such, this would enable the Company to retain progressively increasing levels of mortality and morbidity risks. By increasing the retention limits applicable to the future new business, the Company can reduce the mortality/morbidity profits ceded away to reinsurers.

The Company has favourable historical mortality/morbidity experience. As the reinsurance claim recoveries are only 50%-55% of the reinsurance premiums, this suggests that there is room for the Company to secure more favourable terms from the reinsurers.

The Company can consider running a competitive process inviting multiple reinsurers, enabling a better price discovery and securing a better deal for the Company.

The Company should examine its mortality/morbidity experience separately by distribution channels. It is possible that the experience for some channels (e.g. Digital or Bancassurance) is significantly better than other channels (e.g. Agency). If so, the Company can explore negotiating reinsurance premium rates that vary by channel to eliminate the channel-mix risk arising from its reinsurance terms.

If the Company decides to alter the reinsurance arrangements applicable to the future new business, similar to the existing business, it should also consider including the 'recapture', 'increasing retention' and 'profit share' clauses in order to prevent substantial profits being ceded away if the experience turns out to be significantly favorable:

[10]
[50 Marks]

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