

**Nov 2020**

**Subject F202 — Life Insurance**

**Specialist Applications**

**EXAMINER'S REPORT**

## QUESTION 1

**A South African life assurer sells a range of risk products including a basic low-priced critical illness product. The company is looking to enhance the critical illness product with additional payout levels and conditions.**

**The current product pays 100% of the sum assured for the two most severe of the four SCIDEP severity levels. It does not pay out for the other two severity levels. It also covers a few other conditions in addition to the four conditions covered by SCIDEP. These additional conditions pay 25% of the sum assured.**

**The company has decided to implement the following changes:**

- **Introduce a 50% benefit level for the other two SCIDEP severity levels.**
  - **Add 5 new conditions to the list of conditions covered. These will also pay out 25% of the sum assured.**
  - **Introduce a survival benefit payable after a claim event. The benefit is 20% of the sum assured and will be paid out on survival to the end of each future five-year period. This benefit only pays out if the original claim was at the 100% SCIDEP payout level.**
- i. State the advantages and disadvantages of the suggested product changes and outline any other factors that the life assurer should consider in the product development process.**

*This question was answered well by most candidates. Better candidates managed to pick up on more of the issues and factors for consideration, specifically around the survival benefit and the new longevity / annuity issues introduced.*

### Advantages

The product will be more attractive to customers as it:

- Covers more conditions.
- Pays out at lower severity levels for the SCIDEP definitions.
- The longevity element of the product will be very attractive to customers as this will enable ongoing financial support if they survive the condition.

The product may be more competitive as more conditions are covered now which may mean the product is more in line with, or better than, what other competitors are doing.

The longevity element of the product may be viewed as an innovative product design if this is not available in the market already.

All of this should have the intended result of increasing sales and market share.

### Disadvantages

There will be a reasonable price increase as there are more conditions being covered and lower severity level payouts.

The price increase relative to the perceived value added by changes is what will determine the impact on new sales.

Additional definitions for new conditions and lower severities for the SCIDEP conditions may increase the complexity of the product.

The more conditions covered the higher the chance of more non-disclosure at underwriting stage. (This is not necessarily intentional).

The survival benefit introduces an element of longevity risk to the company which is new. People may survive longer than anticipated.

The survival rates are also new, and likely uncertain, assumptions. Will need a post-diagnosis survival basis for each of the SCIDEP conditions.

There will be higher claims volumes.

This benefit will also require a type of claims-in-payment reserve and reserving basis that will need to be set up and monitored for these claims as they occur.

### Factors to consider:

The impact on sales volumes and profitability of the company.

Can the new product be priced to deliver a return that compensates it for the risks taken?

Whether the company has the necessary data to price and reserve for these changes, both the new conditions and survival benefit.

The impact on capital requirements and how they are to be financed.

Survival benefit will likely introduce a new element of solvency capital.

The impact on any options and guarantees in the product.

Whether changes to any current reinsurance arrangement are required or whether new reinsurance cover should be sought.

These changes will have an impact on claims and underwriting process and approach and as such these processes will need amending and the teams will need training.

Changes will require training for sales staff to ensure that the product is sold correctly, and that the changes are understood.

Can the administration system handle the changes to be implemented?

The costs associated with any underwriting, claims or admin system changes.

Are there any legal or regulatory issues to consider due to the changes?

Treating customers fairly – have all the TCF considerations been followed?

Would the new product result in a lapse and re-entry risk?

The implications of current policyholders potentially wanting the new product, e.g. will they need to be re-underwritten.

**ii. Outline the additional risks introduced to the company through the suggested changes to the product.**

*This question was answered reasonably well by most candidates. Better candidates provided more detail on the main morbidity and longevity risks as well as the risk associated with the new definitions.*

*Morbidity risk*

The company is exposed to a significant level of additional morbidity risk through new conditions and covering lower severity levels on the SCIDEP conditions.

This risk is exacerbated by the possibility of earlier detection due to improved diagnostic techniques and other medical advances. Especially the lower severities.

The company may not have the appropriate data for the lower severity levels and most probably have nothing for the new conditions being covered.

*Longevity risk*

By introducing the survival element of the product, the company is now also exposed to longevity risk.

Medical advances may impact the longevity of policyholders with certain conditions which will adversely affect the longevity claims.

Data on the longevity of patients with certain conditions may be difficult to obtain which will make pricing difficult and uncertain, increasing the risk.

Incorrect morbidity and survival assumptions will ultimately lead to incorrect risk pricing.

*Definition risk*

By introducing lower severity definitions, the company needs to ensure that the definitions themselves are fair, understandable and future-proofed as far as possible.

Medical advances in future may invalidate certain tests and diagnostic proof for some of the conditions.

Definitions should be accurate enough to avoid unintended claims.

There is also a risk that the definitions are too lenient which could open the company up to anti-selection.

The definitions will need to be continuously assessed and updated.

#### *TCF risk*

There is a risk that the changes can be seen to be unfair to customers if the definitions are unlikely to pay out or pay too infrequently relative to the premium increase.

#### *Model risk*

Pricing and valuation models should be adapted for the changes.

This introduces a risk that the models are incorrectly adapted.

Consequences of incorrect assumptions used in the model.

The output from models is incorrectly interpreted which leads to incorrect conclusions, pricing / reserving impact and therefore pricing / reserving adjustments.

#### *Operational risk*

Risk that the staff are not correctly informed of the changes or trained.

This could lead to poor underwriting and claims decision or selling and advice.

There will be increased pressure on the claims teams who would have to deal with the different definitions and increased volumes of claims due to the addition of conditions.

There is a risk that the admin systems cannot handle the new product changes.

Which may all lead to admin errors and reputational risk.

There is a risk that the reinsurer does not agree with the changes on the product and / or the impact on the reinsurance rates for these changes are not viable.

#### *Business volumes risk*

The changes in the policy may introduce higher volumes of the product being sold which may introduce additional capital strain unexpectedly.

Too few policies being sold may result in development costs not being recovered.

The change in sales volumes may introduce a business mix risk if the new conditions e.g. attract a different age group or gender.

Or an increased number of unhealthy lives or anti-selection due to the change in severity levels. Especially if product is more generous than competitors.

The risk may be that all the above is not allowed for sufficiently in the pricing basis and the product is mispriced.

**iii. Describe how you would approach the pricing of the suggested changes and suggest risk mitigation strategies for the main risks introduced by these changes.**

*This question was answered surprisingly poorly by a number of candidates. Too many candidates provided a very generic answer as to how a technical pricing exercise would work without any of the context provided by the question. These candidates missed many of the points around the derivation of new incidence rates or mortality rates for the survival benefit.*

Pricing of changes

Definition research - the pricing actuary will be involved with the specification of the definitions of the added conditions and the 50% benefit payouts.

The pricing impact will be dependent on the actual wording of the definitions and therefore it is very important that the pricing actuary is involved in this step.

In this phase, the actuary will work very closely with medical / claims / underwriting experts of the company to inform the pricing impacts.

The experience on the current SCIDEP benefits could be used to inform the pricing of the 50% benefits.

Industry data could also be used if the new conditions and these severity levels are covered by the industry already.

Otherwise international data or medical research will be used to estimate incidence rates.

These should be adjusted to allow for the difference in demographics, the insured vs. population and the exact wording of the definitions.

Medical research should be available on the survival rate of patients with certain conditions. These can be used to inform the pricing of the longevity element (survival benefit) of the product.

A discount rate assumption will be required for the claims-in-payment reserve for the survival benefit.

If the product is to be reinsured, then the reinsurer would assist in pricing and may have additional data and experience or insights to rely on.

The expense assumptions should be adjusted to allow for the impact on the claims and underwriting resources as a result of the increased claims volumes.

Sales costs (commission) also needs to be looked at. Especially if the method or channel changes.

The lapse assumptions should be similar however it should be born in mind how the current policyholders will be treated to avoid lapse and re-entry issues.

The risk discount rates and profit margins should probably be slightly higher than is the case currently to allow for the additional uncertainty around assumptions.

### Risk mitigation

The company could introduce maximum benefits amounts for some of the new conditions.

For the longevity benefit, there could be a maximum survival period that the benefits will be paid out for.

As this benefit is defined as a 20% of the Sum Assured, this can also be restricted to a maximum monetary amount for each payout.

Change the product to be a term product to limit the company's exposure to risk rate uncertainty in the older ages.

Ensure that premium rates are reviewable, either fully reviewable or with a limited guarantee period to ensure that the company can respond to medical advance and changes in experience.

Ensure that there is a process in place whereby the definitions on the product can be reviewed and adjusted periodically and implemented for all policyholders to allow for medical advances, changes in diagnostic and treatment procedures.

Adjust reinsurance arrangement to reduce exposure until experience builds up.

Involve current reinsurer early in the product development phase to ensure product changes are mutually agreed and all definition risks are addressed before implementation.

Ensure that there is an efficient and robust experience monitoring process in place – this will enable the company to identify underwriting and claims experience issues early on and ensure that appropriate action can be taken quickly.

Ensure sales, claims and underwriting staff are properly trained and informed of the changes to the product to reduce operational issues.

Adjust waiting periods on pre-existing conditions to limit potential anti-selection.

Ensure models are tested appropriately to avoid model risk.

Shock and sensitivity test should be run on the assumptions to assess the impact on the profitability and solvency of these assumptions.

**The company is also reviewing the reinsurance arrangement that is in place for its critical illness book. There is currently a quota share arrangement where 80% of the risk up to R10 million sum assured is retained, with everything thereafter being ceded to the reinsurer. The company is considering changing the arrangement to retaining 50% of the risk up to R5 million sum assured, ceding everything thereafter to the reinsurer.**

**iv. Discuss the reasons the company may have for considering this change in reinsurance cover.**

*This question was answered well by most candidates. Better candidates managed to touch on all the major reasons for a possible change.*

The suggestion is that the company should retain less of the risk.

Usually an insurance company will reduce reinsurance / retain more of the cover in time as their experience in covering a certain product increases or the book grows to such a level that the volatility reduced to acceptable levels.

In this instance, the company is suggesting retaining less of the risk which indicates that they may be more uncertain of the outcome of the product changes being implemented.

As most of the changes are made to the SCIDEP definitions, the claims impact may be significant, and it seems that the company would prefer to be shielded against uncertainty in the claims experience.

The changes, the survival benefit, may have also led to an increase in the solvency capital calculation for the product. Retaining less would reduce this impact on the solvency capital.

The company may be concerned about the increase in sales volumes as a result of the changes to the product which will impact their solvency requirements – increased reinsurance will free up capital which will enable the company to write more business.

Reinsurers also generally assist in development underwriting, claims and pricing of products with a greater level of involvement where the portion of the business ceded is bigger. The company may value the additional input from the reinsurer.

The product changes would likely result in more complex cases to underwrite and more complex claims to assess. Greater involvement from the reinsurers may be desired.

The reinsurance rates may be more favourable at a lower retention level as the reinsurer will get higher volumes. The impact of the price change to the product may be limited due to more competitive reinsurance rates.

## QUESTION 2

**An established South African life assurer is considering purchasing a newly established small unlisted life assurer. An appraisal value is being used as the starting point for the purchase price negotiations.**

**The new business component of the appraisal value makes up more than half of the appraisal value.**

**i. State the possible reasons for this.**

*This question was answered either well or poorly by candidates. The candidates that answered the question well picked up on the fact that it was a new company with a high level of potential for new business relative to existing business.*

The appraisal value consists of the embedded value and the present value of the distributable earnings from expected future new business.

Because it is newly established, the number of policies on the books could be quite small compared to the number of policies that are expected to be sold in future years.

Therefore, the value of the expected profits from the new business could be higher than the value of expected profits from the in-force business.

With a small company overhead expenses may be relatively high, resulting in high unit expenses.

As the business grows, these overheads will be spread over more policies, resulting in lower unit expenses.

The calculation of the value of future new business may already take the expected lower unit expenses into account.

In this case the value of the profits from future policies will be comparatively higher than that from existing policies.

The embedded value includes an allowance for the cost of required capital. With a small company, minimum capital requirements may 'bite' in the EV calculation for in force business, but the allowance for the cost of capital may be lower in the calculation of the value of future new business.

**The purchaser has asked you to assess the appropriateness of the appraisal value calculation.**

- ii. Discuss the factors that you would investigate. (You need not discuss the formulae in the actual model).**

*This question was answered poorly by many candidates. Many candidates missed some of the more basic EV checks and didn't manage to provide much of substance with regards to investigating the new business component. Better candidates provided points on new business assumptions, consequences of new business scenarios and points related to expenses.*

Embedded value:

Compare the embedded value in the appraisal value calculation to the previous reporting periods published embedded value (if available).

Confirm that the assumptions underlying the embedded value calculation are in line with those used in the previous calculation.

Any 'lightening' of assumptions, which would increase the embedded value, should be justified by recent experience.

Check that the profit projected from the EV model in the first year after the calculation date is consistent with budgeted profits/previous year's actual profits.

The value placed on the future new business will have the most uncertainty and should be the focus of the checks.

The future VNB could be a multiple of one year's VNB, or projected future volumes multiplied by a margin, and then discounted.

In the case of a multiplier, check the derivation of the multiplier.

The risk discount rate used to discount future new business values is usually higher than that used to discount expected profits for in-force business due to the greater level of uncertainty.

Check that the risk discount rate used (for in-force and future new business) is consistent with discount rate used by the purchaser for the valuation of other businesses it owns (fully or partly).

The value of the future new business will be very sensitive to the assumption about the future new business growth.

For a new company, high levels of new business growth may be reasonable for a short period, but it may be difficult to keep increasing the volumes at a high rate for a longer period of time, so one would expect the growth rate to taper off after a few years.

Consider the competitiveness of the company's product pricing. High levels of new business growth may not be viable if the pricing is uncompetitive.

You should also check that the mix of business in the future new business projections is reasonable.

If the business expands rapidly, then it may start to incur extra overhead expenses (such as more office space, IT requirements, etc.).

Check that provision has been made for these expenses in the overall valuation – they are unlikely to be included in the unit expenses used in the projections.

Selling large volumes of new business may generate a large new business strain.

Check how this new business strain will be financed, and whether provision has been made for the cost of the financing in the appraisal value.

Similarly, as the business expands, its capital requirements (both statutory and economic) may increase. Check that provision has been made for the funding of any extra capital.

The appraisal value should be calculated on several scenarios, which will give some insight into what factors affect the expected value the most.

Consider how the valuation should take into consideration external factors, such as the Retail Distribution Review, and introduction of IFRS17, which could change the timing of the emergence of profit and therefore affect the present value of that profit.

**The company purchases the new insurer at a discount to the calculated appraisal value.**

**iii. Describe how you would analyse the return on the purchase price one year later.**

*This question was answered poorly by most candidates. Most candidates could set out how to work out a return on the EV component but not the new business component. Most candidates also failed to deal with the initial discount on the purchase price.*

The analysis of change in appraisal value would be split between an analysis of the change in in-force EV and change in the value of the future new business.

Consideration would have to be given as how to handle the discounted purchase price.

If the appraisal value after one year is calculated on the base set of assumptions before applying the discount, then the discount will effectively be 'released'.

This will inflate the increase in appraisal value and in turn the return on purchase price.

The insurer will need to decide whether to gradually remove the discount over time, or keep it in the calculation, which will lead to positive experience variances emerging over time.

It is desirable to have consistent treatment between reporting periods.

A practical method may have to be found to incorporate the discount into the appraisal value calculation, such as using a higher risk discount rate for the future new business.

The analysis of the change in appraisal value would comprise of:

Analysis of change in in-force embedded value (EV earnings)

- The expected return on covered business
- The expected return on adjusted net worth
- Value added by new business sold in the valuation period
- Operating experience variances
- Operating assumption changes
- Investment variances on covered business and adjusted net worth.
- The effect of changes in economic assumptions

The company may want to show difference between the value of new business sold in the first year and that that was projected in the appraisal value calculation, especially since future new business forms such a large portion of the appraisal value.

Analysis of the Change in the value of future new business:

Unwinding of the value of future new business, which involves subtracting the first year's projected VNB and discounting the future years' VNBs by one year less.

Change in the base value of VNB used for future projections.

This can be split into

- Product mix
- Decrement assumption changes
- Expense assumptions changes (recurring and acquisition)
- Allowance for the cost of required capital
- Economic assumptions changes

Change in expected product mixes if projected separately

Change in the projected future new business volumes.

Or the multiplier if fixed number is used.

This change could be split between the effects of the change in future expected inflation, and the effect in the change in the expectation of future real growth rates/growth patterns.

Where future new business values are projected and discounted, calculate the effect of the change in the discount rate.

The rand return on appraisal value is the sum of EV earnings, the variance in the value of new business sold in the reporting period and the change in the value of future new business.

To get the rate of return, divide the rand return by the starting appraisal value.

As with EV earnings, the company may want to separate the effects of economic assumptions changes from the total return to get an 'operating return' on appraisal value.

**iv. Explain how the acquisition of the small insurer will change the purchaser's Solvency Capital Requirement (SCR) cover.**

*This question was answered very poorly by most candidates. Candidates did not appear to know how the new company would be incorporated onto the SAM balance sheet and valued.*

SCR cover is the ratio of Eligible Own Funds to SCR.

The newly acquired insurer will be included in the insurer's assets as a 'participation'.

Participations must be valued at:

- Market value, if listed.
- Adjusted net asset value, if unlisted and possible.
- IFRS value, otherwise.

Since the insurer is not listed, and given that it is an insurer licenced by the Prudential Authority, then the adjusted net asset value will be used,

This is taken as basic own funds (or the equivalent).

The basic own funds will be less than the appraisal value since the value of future new business is not included in the basic own funds.

Therefore, the value of the purchaser's assets will decrease because they paid more for the insurer than it can now be valued it for SAM purposes.

Participations are categorised as equities when performing asset stresses in the SCR calculation.

If for instance, the purchaser paid cash for the insurer, then for SCR purposes it will now have a higher proportion of equities. SCR asset stresses will therefore be higher, resulting in a higher SCR.

Overall, the reduction in Own Funds and increase in SCR will lead to a lower SCR cover.

### QUESTION 3

#### **Outline the purpose of both the statutory (SAM) valuation and the ORSA.**

*This question was answered reasonably well. Candidates that performed better were able to set out more points with regards to the purpose. Candidates that did not perform well provided many points on what the valuation and ORSA were but not enough with regards to their purpose.*

The main purpose of the statutory/regulatory/SAM valuation is to demonstrate to the regulatory authority that the life insurer is in a sound financial condition.

The quantitative requirement for solvency is that the excess of assets (after adjustments) over liabilities (including technical provisions) exceeds the solvency capital requirement (SCR).

In more extreme circumstances, the SAM valuation will demonstrate whether the company has the minimum capital to allow it to operate – the minimum capital requirement.

The statutory valuation also demonstrates the financial strength of the company to other stakeholders such as policyholders and shareholders.

SCR cover gives a simplistic measure to compare the relative strength of life insurers.

The statutory valuation, however, only demonstrates solvency at a point in time. It is designed to ensure that the probability of failure over a 1-year period corresponds to a 1 in 200-year event.

This is a necessary, but not enough, condition to ensure ongoing solvency.

The main purpose of the ORSA (Own Risk and Solvency Assessment) is to determine the amount of capital needed to ensure future solvency and to meet the needs of the business plans.

Conducting an ORSA is a regulatory requirement

which has the objectives of assessing

- the resilience of an insurer's solvency across a range of possible scenarios.
- the overall solvency needs of the insurer considering the specific risk profile, approved risk appetite and business strategy of the insurer.
- compliance, on a continuous basis, with financial soundness requirements.
- the significance with which the risk profile of the insurer deviates from the implied risk profile underlying the financial soundness requirements.

In addition to fulfilling the statutory role, an insurer may use the ORSA to determine the amount of required capital (or economic capital) that it needs to hold to meet its objectives.

The ORSA will help determine the capital required to:

- to maintain a certain SCR cover (or that the probability of the SCR cover falling below that level is acceptably low).
- be able to meet policyholders' reasonable benefit expectations.
- to fund the ongoing business strategy.
- support the investment strategy (particularly if a riskier investment strategy is envisaged).
- fund development costs (e.g. implementation of IFRS17).
- or, particularly in the case of the small insurer that is planning to expand rapidly, the cost of building new branch offices, etc.
- acquire other companies or blocks of business.
- support with-profits business and the level of smoothing that is desired.

The ORSA can show the level of capital required to fund its new business plans, or alternatively the level of new business that can be supported by the existing capital.

Overall, the ORSA allows the impacts of strategic business decisions to be assessed.

The company may use the ORSA exercise to determine the probability of meeting metrics ratings agencies focus on, such as the level of SCR cover.

END OF MARKING SCHEDULE