

May 2017

Subject F202 — Life Insurance

Specialist Applications

EXAMINER'S REPORT

QUESTION 1

Board Notice 158 requires insurers to establish and maintain an effective risk management system which includes risk management policies.

- (i) Set out what would be included in a life insurance company's underwriting risk management policy.**

This question was poorly answered. It was a straight bookwork question but candidates should be able to take a common-sense approach to what should be in an underwriting risk management policy, which some did. Some candidates interpreted this as a specific medical underwriting policy and not as overarching insurance underwriting (the taking on of risk / liability).

The underwriting risk management policy must :

Identify the nature of the insurer's insurance business, including :

- the classes of insurance to be underwritten
- the types of risks that may be underwritten and those that are to be excluded

Describe the formal risk assessment process in underwriting, including :

- the criteria used for risk assessment
- the methods for monitoring emerging experience
- the methods by which the emerging experience is taken into consideration in the underwriting process

Provide for decision-making processes and controls where non-mandated intermediaries or underwriting managers perform binder functions on behalf of the insurer in accordance with Part 6 of the Regulations made under the Act.

Set out the actions to be taken by the insurer to assess and manage the risk of loss, or of adverse change in the values of insurance and reinsurance liabilities, resulting from inadequate pricing and provisioning assumptions.

Set out the relevant data to be considered in the underwriting and reserving processes.

Provide for the regular review of the adequacy of claims management procedures, including the extent to which they cover the overall cycle of claims.

A South African life insurance company has decided to launch a new limited underwriting version of its current life assurance product sold, where the only benefit payable is on death. The current life assurance product is fully underwritten. The underwriting of the new product will be limited to five questions and these questions can only be answered as “yes” or “no”. The cover will be accepted or declined based on the answers provided. No medical assessments will be required.

(ii) State the reasons that the company may have for launching this new product.

This question was well answered. Most candidates picked up on the main issues of a simpler and quicker process which would suit new scenarios / markets / sales channels. Lots of the more obvious points we left out though, e.g. wanting to increase profit, market share or reduce expenses.

Any new product would ultimately be developed to make profit and increase shareholder worth / embedded value.

The company may be looking to develop a product that is quicker and easier to issue :

- The company may want a streamlined sales process that requires no manual intervention as part of a digitisation strategy.
- The company may be looking at distributing life cover through a new sales channel (e.g. online distribution) that requires a simpler and quicker process.
- The company may be looking at developing a product that is easier to sell by the agent / broker.

The company may be facing competitive pressure, i.e. other companies offer this product. It may be losing out on opportunities to write this type of business.

The company could be looking to increase market share or create a new market (develop a product that people who aren't buying the traditional product would consider buying.)

The company may be attempting to reduce the upfront cost of selling policies. (no medicals and fewer underwriting staff)

The company may be attempting to reduce the number of policies that are applied for but are lost through the underwriting process. Policies ultimately not taken up as opposed to declined.

The company could be looking to be seen as an innovative insurer in terms of its product offering.

(iii) Describe the risks that the company would be exposed to through the launch of this new product and how it could attempt to manage or mitigate the insurance risk.

This question was reasonably answered. Most candidates picked up on the anti-selection risk and the better candidates also picked up on the reputational and operational risks as well. Many candidates however missed the points on the assumption risks related to this new grouping of policyholders that would include previously standard and non-standard lives in terms of health.

Better candidates also provided a more detailed assessment of the risk mitigation options available.

Risks

The main risk would be insurance risk. Insurance risk refers to fluctuation in the timing, frequency and severity of claim events and amounts, relative to the expectations at the time of underwriting.

Due to this being a new product the insurance risk is greater as assumptions linked to mortality and persistency are largely unknown.

There is also potential for worse mortality experience development due to the following

- This product is likely to attract more anti-selection through fewer tests and checks being performed.
- Lives that are loaded or declined on the standard life product may attempt to purchase this product. As such you would naturally attract more unhealthy lives.
- A book of less healthy lives is also likely to experience anti-selective lapsation which would worsen experience in the longer term.

The company will need to decide how to treat lives that would traditionally be loaded under the standard product through the underwriting process. It is likely that those with minor health impairments are offered the new product while those with more severe impairments will be declined.

Some assumption on the mix of policyholders will be required

- There will need to be an assumption with regards to the proportion of healthy lives and unhealthy lives that would be loaded under the standard product that would now be offered standard rates under this product (with the remainder being declined).

- In addition to the numbers of healthy and unhealthy lives, there will need to be an assumption with regards to the degree of health impairment of the “unhealthy” lives that are now being offered standard rates.
- These assumptions may not hold. There may be more unhealthy lives than expected or generally healthier lives than expected in the pool that is offered cover.
- This will result in mispricing.

There is a risk that the UW questions don't have the desired effect and that the incorrect lives are offered cover. This will also result in mispricing.

In addition to the risk of pricing too low due to assumptions being unknown, there is also the risk that it is priced too high and will not be competitive.

There is the risk that the new product could just be sold instead of the current product, resulting in no growth or increase in competitiveness.

There will be new operational risks

- This product requires a new automated UW process / system. There could be failures in this new system.
- New internal systems may be required to administer the product. Risk of delays in build or errors.
- Fewer upfront checks and controls could result in more fraudulent policies / claims.
- If the company is planning on selling through a new sales channel, it will present a new set of risks in terms of systems, sales force and target market.

{other valid examples}

There will be new reputational risks

- There are likely to be more declined policies on this product which may be perceived negatively in the market.
- Potential policyholders purchasing the product without assistance (direct sales) or through untrained agents may not understand the questions. There is then the risk of a declined claim through no intent to defraud the company.
- Due to fewer checks at UW stage there will need to be more claims UW to check for non-disclosure. This may also be viewed negatively by the market.

As this is a new product with new processes and new sales processes, a new TCF assessment will be required up front.

There is risk that the company does not have the requisite skills to appropriately approve an review these product changes.

This product will not likely pose a solvency risk but there is the risk that these policies may require more solvency capital than the standard life products.

Manage or mitigate the insurance risk

The best way to manage the insurance risk would be for frequent experience analyses made as part of the actuarial control cycle. Feedback from developing experience is fed back into the pricing basis and UW process.

The company could also adjust the product in order to eliminate some of the potential risks:

- It could introduce a waiting period at policy inception to manage the worst of the anti-selection risk.
- There could also only be accident cover at the start of the cover period.
- Ensure a generic pre-existing conditions exclusion clause.
- Reduce the exposure to these risks through limiting the sums assured for this product.
- Reduce or eliminate options or guarantees available on the standard product. Being able to adjust rates would reduce the risks associated with mispricing the product.

The company could also revisit the UW process that is proposed

- Increasing the number of questions should provide more information for accuracy in assessment.
- Allow for follow up questions on the initial set of questions. This will reduce the speed / simplicity of the process.

These changes to the product or UW process would make the product and UW offering less competitive though.

The company could limit the sales of the new product to existing channels in order to not expose themselves to all the potential risks at once.

The company could make the limited UW product a term life assurance product only. This would avoid the long term potential negative experience developments that are concerns (e.g. anti-selective lapsation).

The company could reinsure more than usual for this product which would reduce insurance risk.

The company could also use the reinsurer for assistance in pricing if they have experience.

(iv) Describe the potential impact the new product would make to the Pillar 1 solvency position under the Solvency Assessment and Management (SAM) framework, compared to the current product, through the use of the standardised formula approach for required capital. (Ignore any impacts on assets)

This question was poorly answered. Many candidates couldn't frame the answer in terms of impacts to BEL, risk margin and SCR. Many candidates also missed the simple point that with a higher mortality assumption the shock on the mortality would lead to a higher SCR number.

The difference in impact on solvency could come through a different impact in technical provisions (best estimate liability + risk margin) or the SCR.

Both products are likely to have a negative reserve value at point of sale which would reduce the BEL.

The new LUW product is also likely to have higher margins in the premiums due to it being a new product with higher risk. This would make the negative reserve larger than for an equivalent traditional life assurance product with a lower premium.

However, the company may increase the risk margin due to it being a new product.

The mortality and lapse rates expected for this product would impact the expected duration of the future profit stream which would also impact the size of the negative reserve.

Any differences in guarantees on the two products could also impact the contract boundaries used.

The impact on the SCR will be through the shocks under the life component of the standardised SCR formula.

- The mortality assumption on this product would be higher and as such the shocks applied to the mortality would result in a higher SCR value.
- The same would apply to lapses but the impact would depend on the direction and size of the relative differences in the lapse assumptions.

- Contributions to other shocks are likely to be similar.

There will very little impact (probably none) on the other components of the standardized SCR formula.

If the two products are reinsured differently they will have a different impact on solvency.

Even though there are differences in the solvency impact of the two products they are unlikely to be significant.

The total difference on the solvency position would depend on the sizes and directions of the all these differences.

Various innovations in general insurance products have recently taken place. There are general insurance products that allow a policyholder to switch parts of the cover on and off to match their needs. For example, for a product covering personal belongings, a policyholder could decide to cover an item only when they are out of the house or travelling and not all of the time. They can then switch the cover on when they leave the house or travel and switch it off when it is no longer required.

- (v) **Discuss the use of this concept in relation to life assurance in general and outline any specific circumstances in which it could potentially be used.**

Attempts at this question were either good or poor. Many candidates didn't comment on the issue of life insurance being for beneficiaries / dependants and as such there aren't frequent times of need or no need. Better candidates also picked up on the risks associated with life cover being switched off when it is needed.

There were some decent attempts at providing scenarios where the concept may work.

The concept of life assurance being needed and not being needed at fairly regular and short intervals is not as applicable as it is to general insurance.

The need for life assurance is to provide for beneficiaries in the event of death. It is difficult to envisage moments when your beneficiaries would not need the cover and as such a need to switch it off.

Lapsing a policy when you do not have dependents relying on you or the cover anymore is a different scenario.

Even under this scenario, a policy that would allow you to automatically restart your life assurance at a future date after lapsation would be very anti-selective and impossible to underwrite and price for. For example, restarting the policy years later after a cancer diagnosis.

For life assurance there is also a potential moral risk. A policyholder could switch the life assurance off during a time of financial distress to save money and should the policyholder die during this period the beneficiaries would be left without cover, and possibly without knowing the cover had been switched off.

This would also result in potential reputational damage for the insurance company and industry.

The product could work for accidental life assurance.

- This removes selection for medical / health reasons.
- It is not cover that would apply in all circumstances and as such is built for a specific purpose already.
- It is understood that the cover only pays out on certain events.
- There could be a scenario where a policyholder is putting their life at more risk and may want (additional) life cover for this extra risk only for the period. e.g. visiting a dangerous location, extreme sport etc.

Even under these scenarios the accident cover will be subject to a large amount of anti-selection which would need to be priced for and the extreme risks (e.g. going to war) underwritten out or excluded.

As such this product would cost more than a standard accidental death policy.

QUESTION 2

A South African life insurance company has recently updated its range of risk-only individual products. The pricing criterion it uses is the value of new business (VNB) margin on a representative set of model points. The actual VNB margin has been calculated at the end of the first reporting period during which this business has been sold. The VNB is significantly lower than that priced for.

- (i) **Set out the factors you would investigate in order to explain the change in VNB margin.**

Attempts at this question were reasonable. Better candidates picked up on both the possible experience / assumption changes as well as mix of business / product / policyholder differences.

Reasons for lower margin:

The EV/valuation basis for the end of period calculation will probably be different to that used in the pricing calculations.

APN107 requires VNB to be calculated on the same basis as for in-force business.

For lapse and risk decrements, the experience used to derive the company's assumptions will be weighted towards the existing in force book;

and any assumed improvements that were used in the pricing basis would not have materialised to be reflected in the experience analysis.

The economic assumptions (investment return, inflation, risk discount rate) will probably differ from those used in the pricing calculations;

since these are usually set with reference to market rates on the valuation date.

The unit maintenance expense assumptions may be higher than in the pricing basis;

due to expense overruns or a smaller in-force book.

The acquisition expenses allocated to the new block of business may also be higher than assumed in the pricing basis;

due to expense overruns or lower than budgeted sales.

Discretionary margins may have been added by the statutory actuary since the pricing.

The mix/profile of the actual business sold may differ from that of the pricing dataset.

Type of product (death, disability and dread disease) could have different margins and as such if the mix is different, it would result in deviations from the pricing basis.

Differences in the valuation basis and product mix should be the easiest factor to check, so these should be investigated first.

There may not be a consistent VNB margin for all policyholders, so the policyholder profile can be quite significant.

Factors that affect the mix of policyholder profiles are:

- Gender
- Whether rider benefits have been sold
- Products sold with level or increasing premiums
- Smoker status
- Socio-economic class according the insurer's rating system
- Policy terms
- Premium review terms (guarantee terms)

Additional factors:

- Check that the model used in the pricing is consistent with the model used in the valuation.
- With updated products there may be data issues – i.e. the process for capturing policy data and getting it from the admin system to the valuation system may have been corrupted.

(ii) Describe the way in which the supervisory reserves for these products should be calculated (Statutory Valuation Method).

This question was well answered.

Reserves:

The supervisory reserves comprise a prospective rand reserve, calculated according to SAP104 and Board Notice 14.

The rand reserve should be calculated on an individual policy basis.

The reserve calculation involves projecting the cash flows of each policy to a maximum age/projection term, (or maturity date in the case of a term assurance policy).

Expected profits should not be recognised in respect of future options expected to be taken up (e.g. automatic (but non-contractual) premium increases), but expected losses in respect of such options should be recognised.

For in-force policies, assumptions will be needed for the following items:

- Future investment return
- Per policy expenses
- Mortality rates
- Morbidity rates
- Lapse rates
- Mortality and morbidity rates should include an allowance for AIDS
- Reinsurance assumptions
- Tax assumptions
- Renewal commission and claw-back

For PHI claims in-force, an assumption about claim terminations will be needed (through recovery or death).

Assumptions are best estimate, with an allowance for compulsory margins as prescribed by SAP 104 and discretionary margins.

The direction of the lapse margin should be considered carefully, and may need to differ depending on the duration of the policy, for instance. An increase in the assumed level of lapses may be conservative early on in a policy's life, but it is possible that after a certain period a decrease in the lapse assumption may be more conservative.

The reserve for some policies may be negative. The statutory actuary may decide to zeroise these reserves, thereby creating discretionary margins.

The company is considering introducing another product feature whereby premiums are refunded after 15 years.

(iii) Discuss the modelling and valuation basis changes (from the existing product/basis) that will be required to allow for this new feature and include reasons for these changes.

This question was reasonably answered. Better candidates showed an understanding of lapse rates before and after the refund as well as possible mortality differentials.

Valuation basis changes:

The cash flow projection model will need to be modified to allow for the payment of the premium benefit at every 15th policy anniversary.

Care should be taken with premium increases – whether the benefit applies on the extra premium by referring to the date of increase, or the policy inception date and 15th anniversaries.

It will be critical to ensure that the administration system can provide future in-force data with the accumulated premiums since the policy inception/previous 15th policy anniversary, that is necessary to value the benefit.

Since there is an incentive to keep the policy in force for 15 years, assumed lapse rates in the first 15 years should be lower than those for the existing products.

However, at the end of year 15, one would expect a spike in lapse rates, and the assumptions should reflect that.

There will be a selective mortality effect because only policyholders who expect to survive the 15 years will take out the policy;

(since the premiums will be 30% – 40% higher than for a product without the benefit);

and so mortality can be expected to be lower than for the existing product

Conversely, the mortality basis for the policies that do not take up the premium return benefit can be expected to be worse than for the existing product.

This selective effect will be more marked at older ages.

Since this is a new product, there will be little experience on which to base the lapse and mortality changes, though reinsurers may be able to provide some guidance.

Note that an Investment Guarantee reserve is not required (since the benefit can be determined in advance and valued using deterministic methods).

QUESTION 3

A South African life insurance company sells a full range of Group Risk products (Life Assurance, Dread disease cover and Disability cover). Premium rates are reviewed annually. The company does not have detailed data of individual members for valuation purposes.

- (i) Describe the supervisory reserves (Statutory Valuation Method) that would be held for these products.**

This question was well answered and was largely bookwork.

Group Life reserves:

The reserve would consist of the following:

An unexpired (or unearned) premium reserve (UPR), in the case where premiums are payable in advance.

UPR is usually calculated as a fraction of the annual premium corresponding to the proportion of the year up to the next annual renewal date.

An incurred but not reported claims reserve (IBNR) to cover claims that have occurred, but which have not yet been reported to the company on the valuation date.

In determining the extent of the IBNR required, the company will consider its past experience with regards to IBNR claims.

A deficiency reserve to cover inadequacies in its current premium rates.

For instance if it has recently increased premiums due to poor experience, it may need to reserve for future losses from policies that have not reached the next renewal date.

A Profit share reserve for contracts that give an experience refund.

The reserve needs to be accumulated over the period until the next refund is made.

Discretionary reserves such as an allowance for pandemics (e.g. bird flu epidemic) that will not be covered by the reinsurance arrangements.

For PHI claims in payment, a prospective reserve should be calculated.

The reserve should take into account both death and recovery from disability;

and make appropriate allowance for expenses - the cost of paying claims and the cost of monitoring the health of claimants.

A data reserve if there is no detailed data and there is concern about the quality of the data.

The company calculates the embedded value of the Group Risk business on an annual basis and performs an analysis of the change in embedded value.

(ii) Describe in detail how the components of the expected transfer from the policyholders' fund to the shareholders' fund is calculated, and how the items in the EV earnings analysis arise.

(Formulae for the calculation of the items in the EV earnings analysis are not required.)

This question was poorly answered. A lot of candidates struggled to show an understanding of the application of EV theory in practice.

Expected transfer

Expected risk profit = Expected premiums – expected death, disability and dread disease claims;

Individual member data is not available for valuation purposes, so the projection will be total premiums from the schemes that are underwritten, and an average claims ratio (by scheme or in aggregate) to derive the total projected claims.

The claims ratio will include the expected cost of setting up new reserves for new PHI claims from existing in-force business,

Premiums and Claims are net of expected reinsurance

For PHI claims already in payment, the expected transfer will consist of the release of margins in the reserve; i.e.

- Interest on the reserve
- Plus expected release of the reserve due to terminations and deaths
- Less expected claims payments and claims expenses

The expected transfer will also include

- the expected expenses and commission,
- the interest earned on retrospective reserves, (e.g. the IBNR), and
- the expected run-off of the retrospective reserves

EV earnings

EV earnings arise from changes in the Value of In-force business (VIF), Cost of Required Capital (CoRC) and the Adjusted Net Worth (ANW) (or change in surplus)

APN107 suggests the items that should be included in an EV earnings analysis,

and splits the analysis into EV earnings from operating experience, operating assumption variances, investment variances & economic assumption changes and other earnings.

EV earnings items

The value of new business split into VIF, CoRC and ANW, and shown as a separate item in the EV earnings analysis.

The expected return, which is the unwinding of the VIF and the CoRC.

The expected profit transfer should have offsetting values in the ANW and VIF columns.

ANW EV earnings items

ANW Operating Experience variances

Difference between actual and expected death, lump sum disability and dread disease claims (net of reinsurance).

Difference between the actual cost of setting up new reserves for new PHI claimants and the expected cost of setting up these reserves.

Difference between actual payments made for PHI claims inforce, and those expected,

which is a result of actual higher or lower than expected deaths and recoveries from this group.

Difference between actual maintenance expenses and those assumed in the projection, both for active members and PHI claimants in force.

ANW Operating assumption variances

Change in PHI claims in payment reserves due to changes in PHI mortality, recovery rates and expenses, or the model used.

Changes to the methodology used to value IBNR and other retrospective reserves that affect the value of these reserves.

ANW Other Earnings from operations items

The Expected return on ANW.

Extraordinary one-off expenses/Development costs

ANW Investment variances and economic assumption changes

Difference between the actual and expected return on the PHI claims in payment reserve.

Difference between the actual and expected after-tax return on the adjusted net worth.

Effect of changes in the level of interest rates on prospectively valued reserves.

Effect of tax changes on prospectively valued reserves.

Cost of Required Capital EV earnings items

The expected return on Required Capital.

The change in the level of Required Capital allocated to this group of products compared to the expected value.

The other earnings items for the change in CoRC, will be those changes in the VIF that affect the face value of the RC or the value of run-off.

VIF EV earnings items

VIF Operating experience variances

A movements experience item will arise from active lives which arises because the future premiums for the in-force business differ from that projected at the previous year end,

which will be due to a different number of scheme lapses than assumed,

and/or changes in the premium rates for the in-force business.

A movements experience item will arise from PHI claimants in-force. where the actual vs expected number of terminations affects the VIF.

Similarly a claims/risk experience item will arise from PHI claimants in-force. where the actual vs expected number of terminations affects the VIF.

A claims/risk experience item will arise due to the difference between expected & actual PHI claims incepting from the healthy in-force lives at the previous valuation date.

VIF Operating assumption variances

Changes in VIF will arise from

- a change in the future expected claims ratio for the various risk benefits
- a change in the future expected expense ratio
- the change in expected future margin releases from the PHI claims in-force reserves, due to changes in the assumptions
- changes to the models or underlying methodologies used to do the projections
- changes in minority interests

VIF Other EV earnings items

Changes in VIF will arise from

- the change in extraneous economic variables (i.e. interest rates, inflation rates and risk discount rate).
- any change in economic risk margins (e.g. changing the gap between the risk discount rate and the risk free rate assumed), which should be disclosed separately.
- Tax changes.

END OF REPORT