

28 May 2012 (am)

**Subject F202 — Life Insurance
Specialist Applications**

EXAMINERS REPORT

Question 1

(i) Explain how the tax treatment would be altered under this proposal (both in respect of the company and clients), and outline the issues to consider in assessing the proposal.

This bookwork element of this question was relatively well answered, but many struggled to identify the issues involved in the proposal. Some confused an RA with an annuity in payment. Many candidates believed that the insurer could reduce the tax on the tax free fund by offsetting an XSE position from the risk products.

Risk only policies fall into the IPF, implying that taxable income is taxed at 30%.

The premiums of risk only policies do not enjoy any tax benefits in the hands of the policyholder (except for from disability income products).

Policy benefits are not taxed.

RAs fall into the UPF, implying that taxable income is not taxed.

In addition, RA premiums are tax deductible in the policyholder's hands (up to certain limits).

This limit is the maximum of:

- 15% of the income that is not attributable to retirement funding employment;
- R3 500 less deductible contributions to a pension or provident fund;
- R1 750

Policy benefits are in the form of a pension, one third of which may be commuted. The pension is taxed as income; the lump sum according to the appropriate scales.

Issues to consider include:

By packaging the products together, the risk benefits would be treated as UPF business instead of IPF business (i.e. the risk benefits would become 'untaxed').

The reserves under risk only policies may be low or even negative, so 0% tax may be of little benefit in reducing tax.

If moved to the UPF, risk only policies would no longer enjoy tax relief on expenses. These policies have significant upfront commission and underwriting costs.

To implement such a proposal, the insurer would need business reasons other than tax. One would therefore need to consider what other benefits this product design would provide to clients. For example, clients may prefer the simplicity of a single product instead of two.

There may be savings on administration costs by having one policy instead of two. But development costs may outweigh this.

One should consider the potential impact of changes to the tax regime. For example, SARS may want to separate out risk business from investment business.

The market has moved to splitting risk and savings, so one would have to consider the marketing implications.

Most death cover is whole of life. How would the insurer deal with this in the context of a policy that would cease at retirement?

Risk products that cease on NRA (e.g. lump sum disability benefits) might be a better option to link up to an RA, because they would at least have the same term.

If cover is offered only to retirement age, this could impact on the commission paid.

Consider what happens to cover when a section 14 transfer occurs.

The bundled nature of the product will have an effect on persistency.

Risk only products usually allow for various premium patterns, some of which may not be sensible for a savings policy.

(ii) Describe the maximum commission payable on a combined policy as described above. Ignore clawing back of commission.

This was a bookwork question. The better prepared candidates scored well. Some candidates were unaware that commission would be calculated separately for the risk and savings elements.

Maximum commission would be determined per element, i.e. separately for the savings and risk benefits.

Savings:

5% of premiums, paid as and when.

2.5% of this may be discounted (at 6%).

If this discounted commission is less than R400, more than 2.5% may be discounted.

Discount term: min (25, policy term)

Risk:

min (3.25% * term, 85%) * annual premium

An additional one third may be paid in the second year.

Premium increases are treated as new policies.

Question 2

- i **When reporting on embedded values describe how you would distinguish between new business premiums and renewal premiums for a reporting period when calculating the value of new business and the value of in-force business respectively.**

This was a bookwork question and was relatively well answered by most candidates.

The basic principle that should be applied at all times is that the cash flows associated with each premium, and any variation against previous assumptions of these premiums, should be counted **once and only once**.

Premium increases that have already been allowed for in the value of in-force business may not be counted again as new business when they actually occur (i.e. when premiums deviate from what was previously assumed).

New business for VNB

Premiums on expected future new contracts are excluded.

New business is defined as new contracts and one off premium increases in respect of in-force business during the reporting period.

This definition includes business written during the reporting period that has subsequently gone off the books, but excludes policies cancelled at inception.

A new contract or one off premium increase should be included as new business if it has a date of entry during the reporting period and at least one premium, which was not subsequently refunded, has been recognised in the financial statements.

Renewals for the value of in-force business

The projected cash flows used to calculate *PVIF* should include expected future renewal premiums but exclude any value relating to future new business.

Where the actual future renewal premiums differ from the expected future renewal (including deviations in contractual increases and re-pricing of premiums for in-force business), this variation in premium levels should be treated as variance in experience of in-force business rather than as new business.

An example of a variation in renewal premiums is the continuation of contracts beyond the minimum term of an open ended contract i.e. those with no specific end date. (Award a mark for any reasonable example)

Recurrent single premiums and changes to existing contracts, which are not treated as *renewals*, should be included in new business.

Other methods of distinguishing between new and in-force business are allowable, but should be clearly defined in the disclosure.

- ii **Explain which assumptions could give rise to experience variations and which of these are likely to be most significant. Discuss possible reasons for the experience variation for each of the assumptions.**

While candidates were able to identify the main assumptions involved, many answers were too generic, and did not focus sufficiently on the product involved and its particular features. Many candidates seemed to be unsure of what an experience variation is. Some went into detail as to what the impact would be if various assumptions were changed.

Investment return

Expected non-profit annuity income cash flows will probably be matched by long term fixed interest assets and other similar assets (e.g. property and/Swaps)

Exact matching of these cash flows may be difficult due to a lack of the appropriate long term fixed interest assets available in the market.

Therefore, the insurer might apply duration matching as opposed to exact cash flow matching. [Duration matching => assets are managed to have the same average duration as the liabilities]

The lack of exact cash flow matching may result in mismatch profits/losses

Mismatch profits/losses will arise when the actual investment return differs from the expected investment return. Therefore, the change in the value of assets may differ from the change in the value of the liabilities in the reporting period. This will then result in a profit or loss.

The actual return may differ from the expected return due to:

- A change in the shape of the risk free yield curve
- A change in the pick-up/credit spread of the assets relative to the risk free yield curve.
- Actual defaults by issuers of fixed interest assets differ from the expected defaults.

In the EV calculation the expected mismatch profit/loss will probably be zero.

Any actual mismatch profit/loss will represent an investment experience variation in the analysis of change of EV.

This investment experience variation is likely to give rise to the most significant variances

Mortality

Variances in mortality rates may cause changes in emerging profits.

Actual mortality being lighter (i.e. less deaths than expected) than that assumed will cause a negative experience variance and vice versa.

For this large portfolio the mortality experience variation is unlikely to give rise to significant variances in one particular reporting year.

However, if the experience variation follows a trend which justifies a change in the mortality assumption, the impact of this can be significant on the change in EV.

Longevity is the major risk when considering annuity mortality assumptions.

In this regard, a change in the expected future mortality improvement (with a change in the assumption) may have a significant impact on the change in EV.

Persistency

In some circumstances the company may allow terminations if policyholder provides proof of good health to avoid anti-selection. But terminations of non-profit annuities are not very common in the South African insurance industry.

Currently overall not a major issue for NPA. Persistency is not likely to give rise to significant variances.

But persistency may be significantly different in future, e.g. due to increased transfers between competitors because of increasing consumerism.

Expenses

Assumptions will have been made about the cost of administering the in force business.

These may vary over time as the increase in the expense of paying a regular income may not be as expected.

Alternatively expenses may have been set aspirationally so actual costs may not be in line with assumptions.

Given the usual high average case size of the premiums it is unlikely the cost of policy administration will give rise to a significant variance.

There may also be other exceptional expenses that cause a variance, for example due to regulatory changes.

If actual investment returns are different from expected investment return the level of income from the annual asset management charge will differ from the expected. This annual charge may be used to cover expenses, which may then result in an expense experience variance.

The outlook for expense inflation may have changed. This may be linked to the yield curve assumption.

But the extent of this relative to the mismatch profit/loss will be very small.

iii Discuss the factors the actuary needs to consider before making such a change.

This simple question was well answered, with most candidates able to describe the practical issues involved.

The assumptions used for embedded value reporting should be a realistic best estimate. The statutory actuary needs to consider whether the past experience (specially the last year) is likely to be representative of future experience.

Therefore, the statutory actuary needs to consider the following:

The length of time over which the disability claims experience has been worse than the assumptions. The statutory actuary would rather change the assumptions if experience were worse over a sustained period as opposed to a once off event.

Are the data in the experience analysis sufficient, such that the result is credible? If not, statutory actuary may not change the assumptions. (This point refers to the amount of data available, such that the statutory actuary is comfortable that the result is credible)

The statutory actuary should consider how statistically significant the result was. If it was a random variance which is not an indication that the underlying claims experience had worsened, the statutory actuary may not want to change the assumption. (This point refers to: even if the result was credible, the experience in the last year may not be statistically significant to justify a change of the long term assumptions.)

Is there any trend in the experience over time? Any change in assumptions should reflect these trends.

Were there any events that may have worsened the experience in the last year which may not be repeated? Examples include a general economic recession or a down turn in an industry in which many of the company's policyholders are employed.

Similarly, the experience may have been impacted by a large claim (or several large claims).

Lump sum disability vs income protection cover: Is the experience variation for both types of cover? If not, what are the possible reasons? Does the statutory actuary expect it to be repeated in future? Should the assumptions for both types be changed?

For income protection cover, it needs to be investigated whether the adverse experience is due to higher than expected incidence rates, or lower than expected termination rates. If it is the latter, it is less likely that the company will have enough data for the statutory actuary to change the basis. The company could ask their reinsurer to provide assistance on this.

The experience variance may not be related to all disability rating groups. Identify the rating groups which showed the significant variances. Consider changing the assumptions for these rating groups.

Comparability of business over time: Policy conditions may have changed over time. Therefore the definitions of disability may differ for different tranches of business, which may lead to different claims experience.

Claims underwriting: Any changes in the last year? Consider the reasons for these changes. There may have been new staff or new procedures which resulted in a deterioration of the quality of claims underwriting. Is this a permanent or temporary issue?

Consider the extent to which the company is intending and able to implement mitigating action to improve the disability claims experience. This may include stricter claims underwriting.

Consider the financial impact of the likely adjustment of the assumptions.

Although the actuary should use assumptions which he considers to reflect future experience he would need to consider the impact of the changes on the perception of the equity analysts following the performance of the company. He should ensure that he can communicate the rationale for any changes effectively to the investment community.

iv Estimate the impact you expect on the embedded value. How would the impact differ if the company zeroised its negative rand reserves?

Most candidates struggled to reason how the EV would change in this very simple scenario. It was disappointing to see how few addressed the VIF impact or change in cost of capital. Although the question asked for an estimate, many answers contained no attempt to place a rand value on the impact.

Assume that the company does not zeroise negative reserves:

The total embedded value is expected to decrease.

The experience variation was R 10 m in the last year, the expected impact on the elements of the embedded value can be explained as follows:

Net worth (or NAV): The increase of the disability assumption will increase the prospective reserve by a multiple (assume 7) of the experience variation. This reflects the outstanding term of the in-force book of these policies. The R 70 m increase in the reserve will result in a R70 m operating loss. Therefore, the net worth (or NAV) will reduce by R 70 m.

VIF:

- Part of the additional reserve (the R 70 m) created will be a result of the compulsory (PGN 104) margin added to the new best estimate assumption.
- The compulsory (PGN 104) margin for morbidity is a loading of 10%. [i.e. $FSV_decrement_rate = 1.1 \times (best_estimate_decrement_rate)$]
- This compulsory margin will increase the VIF by a proportion (assume 10%) of the additional reserve created. Therefore, the VIF will increase by R 7 m.

The cost of capital will increase by a small proportion (assume 5%) of the additional reserve created. Therefore, this increase in the cost of capital will decrease the EV by R 3.5 mil

If we ignore transfer tax (or tax on operating profit) the impact will be as follows. [or award a mark if a candidate allows for tax in the example calculation]

EV (-R 66.5 m) = Net worth (-R 70 m) + VIF (R 7 m) + Cost of capital(-R3.5m) [or award a mark if a candidate illustrate a similar understanding of the total impact on EV]

If the company does zeroise negative reserves the impact on EV will differ.

The expected impact may then be as follows:

Net worth (or NAV): The increase of the disability assumption may not increase the total reserve held. The reserve would only increase to the extent that per policy reserves are (or become) positive. Otherwise it would only reduce the negative reserves zeroised. On the NAV this will have less impact than if no zeroisation took place. Potentially it may have no impact on the NAV.

VIF will decrease. The negative reserves zeroised is a 2nd tier (discretionary) valuation margin. By zeroising less negative reserves the 2nd tier margin and the VIF will reduce. If we assume a factor of 0.7 to allow for the delay in the release of the 2nd tier margin, the VIF will decrease by R 49 m (=70x0.7)

If the company zeroises negative reserves the expected change in EV will be a smaller decrease in EV compared to the case where the company does not zeroise negative reserves.

Question 3

- i. Explain how you would go about equitably allocating the Rand valued assets to shareholders and individual policyholders and accordingly how you would determine the new benefit value for individual policyholders?**

This was a very challenging question. Most candidates struggled, but those that were able to approach the question in a practical and methodical manner were able to score reasonable marks. Some candidates concentrated on recalculating reserves, which scored few marks.

Allocation of assets

Best possible approach would be on a top down basis as follows:

- Split between Policyholders and shareholders.
- Split assets between policyholder groups.
- Split assets between individual policyholders.

Assuming segregated portfolios of assets were held for Shareholders and Policyholders, it will be relatively easy to allocate the Rand value assets between SH and PH.

This will simply involve taking the new value of each asset and allocating these according to the actual holding of SH and PH prior to the revaluation.

But there may be a transfer between PH and SH funds to the extent that the following are affected: non-profit annuity reserves, risk product reserves, unit linked rand reserves, smoothed bonus rand reserves and IGR.

Will need to make sure that there were not any discrepancies in how the assets were managed and cash flows allocated prior to the revaluation.

Split between policyholder groups

It is most likely that there would be segregated assets pools for unit linked (unit reserve) and smoothed bonus business (the with profit pool). Hence, similar to allocation of assets between PH and SH, the value allocated to these two policyholder groups would be based in the actual holding prior to the revaluation; applying the revised values.

Alternatively, if no segregated assets were held, the actuarial reserves at the time of revaluation could be used to allocate assets.

It is important that only the unit reserves for unit linked business is used. As the split to individual policies will depend on the overall split, we do not want to allocate assets based on non-unit reserves.

For smoothed bonus business, the “reserve” could be based on a total asset share type calculation. This should help ensure that different policyholder groupings are treated equitably.

A further split is then required to allocate assets to a Bonus Stabilisation Reserve (BSR).

The BSR is determined by comparing the new market value of assets in the portfolio to the build-up of premiums, vested bonus and unvested bonus for the in-force policies in the new currency (i.e. the book value). The BSR is set equal to the difference between the MV and the book value of with profit policyholders.

The remaining assets are then allocated to the non-profit business (i.e. Annuity and traditional insurance business).

Split between policyholders

The only two groups that will require an asset allocation on a per policy level would be the unit linked and smoothed bonus policyholders.

For unit linked policyholders, the assets can be split and allocated to individual policyholders based on the proportion of the policy’s unit account value to the total unit account value pre revaluation of assets.

Or equivalently, recalculate unit price as total MV after rebasing divided by total number of units.

For the smoothed bonus policies not calculated on a unitised basis, the assets excluding the BSR should be allocated to the individual policies. Use the proportion of individual policy asset share to the total asset share for the book to allocate assets and hence value to individual policyholders.

[Alternatively, give marks if candidate assumes the portfolio is unitised:

For a unitised smoothed bonus portfolio, the revised asset value will be used to calculate a new “unit price”. By applying this new price to the number of units, the individual policyholder values can be determined.]

Determining revised benefit values

As the unit linked and smoothed bonus policy values relate directly to the asset value, these have already been determined by allocating asset values at an individual policy level as outlined above.

For the remaining policies the benefit values will be expressed in a nominal amount in the previous currency value. The most sensible approach would be to use the latest Rand/foreign currency exchange rate to convert all the benefit values to Rand.

As the country experienced hyperinflation immediately prior to the revaluation, unless a policy was directly linked to an appropriate inflation index, the revised Rand value would be very small.

In fact it is expected that many of the pure risk policies will effectively have a zero value.

For these policies an option would be to allow policyholders to take out a new product, in Rand terms, with limited underwriting requirements.

Similarly for annuitants with no inflation protection, the revised annuity value would be very small.

Consideration could be given to imposing minimum values for policies (both risk and annuity). The company should assess the impact on its reputation of imposing the minimum values (or not). The cost of funding the minimum values would need to be carefully considered.

All this assumes the company is still financially sound. If not, the local legislation regarding bankruptcy would come into play.

ii. Outline how you would go about determining the cost of implementing the minimum and discuss the suggestion, mentioning potential alternatives to funding the cost.

Most candidates identified the TCF issues and were able to identify alternative methods of funding. Unfortunately many candidates believed that a stochastic model would be needed.

Determining the cost of the minimum would be done by using an appropriate cashflow model to value the annuity benefits before and after applying the minimum.

The cashflow model will need to allow for all the cost associated with annuity payments allowing for appropriate decrements. The cost would be the sum of the PV of annuity payments and the PV of expenses.

The projected annuity payments need to include any contractual growth in payments.

The expenses will need to include investment management costs, maintenance expenses and payment expenses with an appropriate allowance for future inflation.

Due to the fact that the government has defaulted, may need to refer to the South African risk free curve for discounting.

The mortality assumptions would need to include improvements and be based on historic experience on the existing business. If insufficient, reference could be made to industry data. Need to consider consistency with the most recent valuation basis.

The assumptions underlying the projections should be based on the regulatory basis, to show the immediate cost / impact on profit.

But there is future value to shareholders in the valuation margins.

Furthermore, the impact on the capital requirements should be determined as there will be a cost associated with holding higher capital due to implementing the minimum.

From a policyholder protection and value perspective, this seems to be a good suggestion. However, someone will have to fund the cost of the increase.

The following would need to be considered when making the decision:

Market practice: What are other industry players doing under these circumstances? This will be something that impacts on the entire industry so industry practice cannot be ignored.

The reason for making the decision to impose a minimum: If the decision is made purely to protect the reputation of the company, it could be argued that the cost of the decision should be borne by shareholders. They will be the ultimate beneficiaries of the enhanced reputation via higher expected dividends in future.

Need to take into account TCF: With profit policyholders would consider it unfair to subsidise another group of policyholders, especially if their own policy values had been eroded by the economic meltdown.

One of the basic expectations of any policyholder would be the continued solvency of the company. If the decision to enhance benefits is made solely to protect the solvency of the company it may be reasonable to pass a proportion of the cost to policyholders. However, the company would need compelling reasons to think that benefit enhancements would improve rather than further threaten the solvency of the company.

One way for policyholders to fund the benefit enhancement would be by funding the cost out of the BSR as suggested. However, under these circumstances any future profit or losses from

a change in environment should accrue to the group of policyholders who paid for the enhancement.

Potential alternatives to funding this cost would be:

- Shareholder injection;
- Rights issue;
- [give marks for any other sensible suggestions].

iii. Explain how you would manage the level of the BSR going forward and discuss the factors that you would take into account when setting bonus rates.

Most candidates showed a reasonable understanding of the issues involved in setting bonus rates, but many failed to apply their knowledge to the particular circumstances of the question.

With such a volatile economy due to the revaluation and hyperinflation, the current bonus smoothing methodology is unlikely to still be appropriate. Hence, you would need to revise the current PPFM.

More volatile going forward, at least in the near future, so would like to strengthen the smoothing. At the same time need to take cognisance of PRE and equity between policyholders. In particular for different generations of policyholders.

This would result in the BSR being allowed to grow larger than would have been done previously. However, you would want to make sure once the economy returns to more normal levels that you revert to a more conventional level of BSR.

Although you would probably not stipulate the exact date in the PPFM, you would want to include something to allow you to change this when the economy returns to a less volatile state.

The declared bonus would be a function of the size of the BSR and the actual returns earned over the period since the previous bonus declaration. With a revaluation of assets, careful consideration will need to be given to the definition of the first year's return.

Similarly, the interim bonus rate would be affected by the expected returns on the asset classes making up the underlying portfolio.

The bonus philosophy included in the PPFM would need to deal with how any profits on non-profit business accrue to with profit policyholders.

With the revaluation of assets, the existing asset mix will again probably not reflect the long term intended investment mix. Deciding on the smoothing methodology and hence the BSR level will need to take into account the short term inability to invest in appropriate assets.

Depending on legislative restrictions, the company would have to consider investing in RSA assets to get exposure to other asset classes, or local corporate bonds.

The government bonds value has fallen to zero. Prior to the revaluation the investment portfolio would most likely have had a fair proportion of government stock. The initial portfolio will now have significant property and equity.

With a large proportion of property in the portfolio, liquidity issues may force the company to have a larger BSR.

Similarly, with a greater than normal level of equity investment, the volatility is likely to exceed the long term expected levels, requiring a larger BSR.

Depending on the reaction in the market surrounding the economy, there may be a “run on the bank” type scenario as policyholders surrender their policies either because they cannot afford future premiums or they need the cash. Consequently, the BSR needs to take into account the cross subsidies that will occur between generations of policyholders.

There is an argument for saying that you should set the BSR level to benefit policyholders that stay longer with the company. However, given the circumstance that may lead to policyholders leaving, you may take a more lenient view on early leavers.

Hence allow surrenders or paid-up policies greater bonus levels than before, reducing the level of the BSR.

The level of interim bonus will need to be reconsidered. Again, given the higher expected volatility, would probably want to reduce interim bonuses to avoid over declaring bonus for leavers which will then need to be funded by longer staying policyholders.

For policyholders that are very close to retirement and invested in a smoothed bonus portfolio, the hyperinflation and revaluation of the currency will have severely depleted their savings.

To assist this generation of policyholders, need to consider a greater level of generational cross subsidy. Younger policyholders/shorter duration in-force policies could be argued to have some time to benefit from a recovering economy.

Need to take into account any regulatory requirements regarding the BSR. Actuarial guidance requires an insurer to establish sufficient reserves that would remove a negative BSR via an under declaration of future bonuses within three years.

If the negative BSR is not expected to be removed through bonus under declaration the shareholders will be expected to inject extra capital, or non-vested bonuses will be expected to be removed.

Further more if the negative BSR is below -7.5% this will need to be disclosed, which could influence bonus declarations.

Need to consider what the competitors are doing. Being too far out of line with other insurers may negatively impact on the retention of policies.

Need to take into account the cost of any guarantees that are still valid on policies. With the revaluation of the currency, many of these guarantees may have fallen away. However, need to ensure that any guarantees still valid (or new guarantees created) and appropriate reserves are established and taken into account when deciding on an appropriate BSR level.

The extent to which a high BSR is maintained may be influenced by the company's solvency position. With an expectation of a volatile economy in the foreseeable future, the projected solvency position, and its impact on the BSR and bonus declarations will need to be carefully monitored.

If the BSR after rebasing is extremely negative, consideration may be given to cancellation of non-vested bonuses. This will have an impact on the reputation of the company and lead to increased withdrawals. The impact of this would depend on what the other players in the market are doing as they would be in a similar position.

Non-vested bonuses may be preferred over vested bonuses to be able to manage volatility. Similarly terminal bonuses may be preferred over regular bonuses (if the bonus structure allows for terminal bonuses.)

If the business in this country is very small compared to the insurer's other operations, it would be more likely to allow a lower BRS / more likely to inject capital when needed, to avoid reputational damage.

END OF REPORT