

May 2020

Subject F202 — Life Insurance

Specialist Applications

EXAMINER'S REPORT

QUESTION 1

An established South African life assurer sells a range of risk products that pay out lump sum benefits. The company wants to add an Income Protection product and a Smooth Bonus Investment product with guarantees. The company uses the standard formula for calculating its solvency capital requirement (SCR) for prudential supervision purposes.

- i. Set out the reasons for a company monitoring its ongoing solvency.**

This question was answered well by most candidates. Better candidates provided more points beyond those related to financial strength only.

The company would want to be confident of their solvency as a going concern into the future.

To satisfy (and report on) the regulatory capital requirements as set out in the Insurance Act (2017) and the associated prudential standards.

To demonstrate their financial soundness / strength to the public at large, including current and future policyholders and investors.

Companies that write with-profits business would want to ensure that their solvency position allows them to:

- support the with-profits bonuses and its smoothing;
- understand if they are at risk of not meeting their policyholders' reasonable benefit expectations.

To assess available capital to fund growth through:

- new business;
- acquiring other companies or blocks of business.

To assess their ability to:

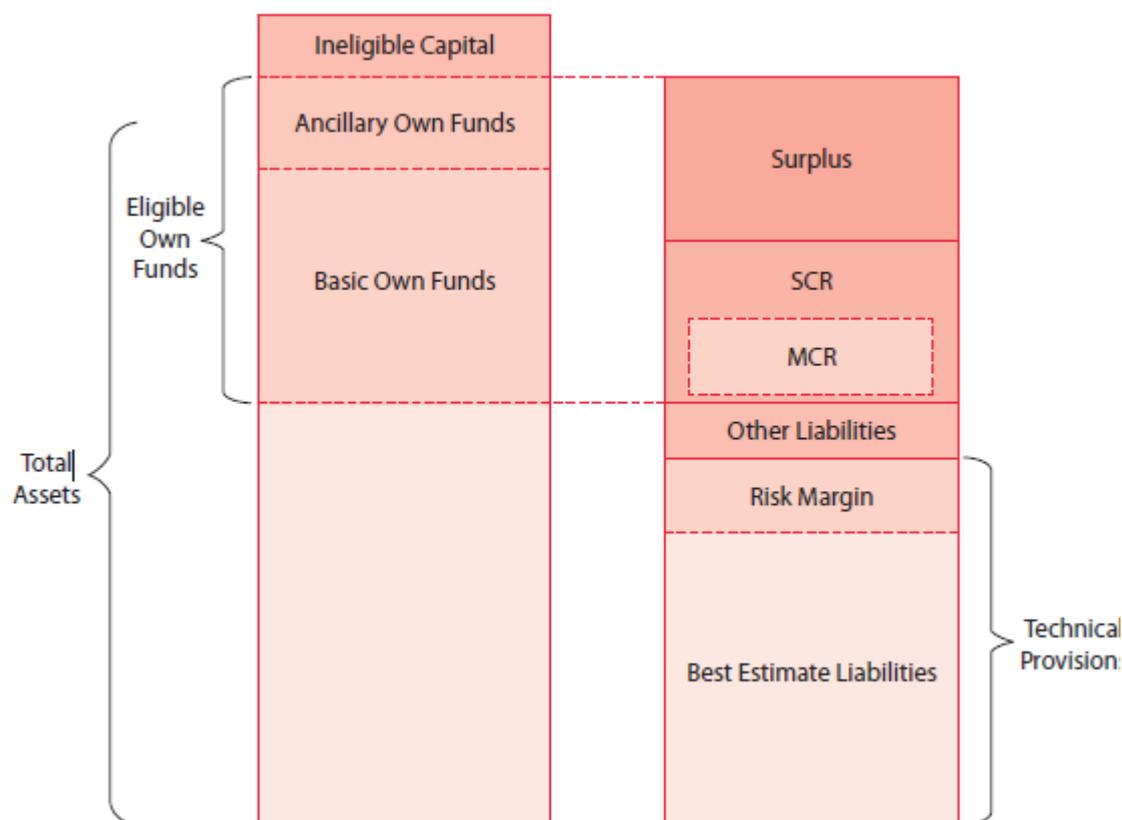
- support a riskier investment strategy;
- weather periods of adverse experience;
- fund overheads and developmental costs.

To perform cost of capital calculations.

To check whether any cost of capital incorporated into benefit pricing is still sufficient.

- ii. Define the main components of the prudential supervision balance sheet and discuss how they are likely to change over time due to the introduction of these new products. Provide details of changes to the SCR calculation by the addition of these new products. (Details of specific shock values are not required).

This question was answered poorly by candidates who did not have a good understanding of the prudential supervision balance sheet as a basis. Candidates that were able to show practically how new products would flow through the balance sheet initially and over time went on to score well. Better candidates picked up on the important differences between a savings and risk product in terms of their impacts on the balance sheet (specifically the SCR).



Prudential supervision balance sheet for reference

The company would write new business to make a profit and therefore expect total assets and surplus to grow as profit emerges over time. The degree to which the company disburses the

profits (company's dividend policy) or retains the profits would impact the growth of assets and surplus over time.

Assets

The valuation of total assets mainly follows International Financial Reporting Standards (IFRS) and the main requirement is that of market consistency and an economic (or fair value) valuation approach.

Both the new savings product and claims in payment reserves from the new IP product would generate large reserves / technical provisions over time.

This in turn would lead to corresponding large increases in assets backing these reserves.

The valuation of assets held is likely to have a larger impact on total asset value than the addition of new business in the short – medium term.

The launch of these new products would more than likely have involved a capital outlay for:

- Systems development
- Staff and agent training
- Marketing
- Etc.

As such an outlay from assets would occur initially.

Basic own funds are defined in the market consistent balance sheet as the excess of assets over liabilities (plus subordinated liabilities, less any regulatory adjustments).

The basic own funds should be expected to grow as total assets grow.

But this will depend on the change between the values of total assets relative to the changes in the Technical Provisions (+ other liabilities) and the SCR.

Ancillary own funds are off-balance sheet capital resources that can be called upon to absorb losses. (e.g. instruments such as letters of credit and guarantees.)

Limits applying to the proportion of Tier 1, Tier 2 and Tier 3 own funds may result in some of the own funds being regarded as ineligible capital for the purposes of determining solvency.

An assessment of how ancillary own funds and ineligible capital would change over time due to the addition of these products is not possible. This would depend on other factors.

Technical Provisions

Technical provisions are the insurance obligations due to policyholders and beneficiaries and are calculated on a market consistent basis.

The best-estimate liability (BEL) is determined as the discounted value of projected cash flows on a policy-by-policy basis using best estimate assumptions.

BEL for Income Protection

The income protection (IP) product would have been priced to produce a profit and as such the BEL for each policy should be negative (capitalised future profit stream) immediately after it is placed on the books.

The cost of selling the policy would have been a cash outflow already.

Each new IP policy would reduce the BEL.

As time passes the BEL for IP policies may remain negative, i.e. future income > future outgo such as in the case of a risk premium or increasing premium policy.

The BEL may also turn positive, e.g. a level premium policy would build up positive reserves.

The BEL would also depend on how the best estimate IP assumptions change over time relative to the pricing basis and how quickly the pricing basis can adapt for new business and in-force business.

This would also be impacted by any premium guarantees on the product and the contract boundary. These may be different to the other risk products.

IP policies that result in claims that would form claims in payment reserves.

This would be part of the BEL (and increase it).

As the book matures and regular claims occur this reserve will become significant.

The movement in the reserve value will depend on the growth in the business and the incidence of new claims and termination of existing claims.

BEL for Smooth Bonus

The smooth bonus (SB) product would result in a much quicker build up of BEL, especially if large single premium policies are sold.

The BEL would be positive and consist of the fund value for each policyholder. The fund value build-up will be based on declared bonuses.

Under prudential supervision reporting, future discretionary benefits also need to be allowed for in the BEL. (Unlike the FSV where a BSR can be held).

The best-estimate future discretionary bonus rates should be based on what the insurer expects to declare, given the with-profits asset pool.

The BEL should not include the value of shareholder transfers in respect of future bonus declarations.

The BEL would also need to include the value of future charges and costs related to the policies.

The guarantees, whether on surrender, death or maturity, would also need to be valued explicitly in the BEL. The higher the number of guarantees, the larger the impact on the BEL. (Stochastic modelling would be required to value this.)

The risk margin represents the premium over and above the best-estimate liabilities that one insurer would require to take on the obligations of another insurer.

As the new products add to the SCR the risk margin will increase.

Other Liabilities

Other liabilities are non-insurance liabilities such as tax liabilities (both current and deferred) and other creditors and can include subordinated debt. These are generally valued using IFRS fair value principles.

Cannot assess how this would change based on new product introductions.

Solvency Capital Requirement

The standardised formula approach calculates the solvency capital requirement within risk modules and is quantified as the effect on the basic own funds of a pre-specified shock scenario or number of scenarios. (These correspond to the Value-at-Risk of the basic own funds of an insurer or reinsurer subject to a confidence level of 99,5% over a one-year period.)

The two modules that will most significantly be impacted through addition of these products are the Life and Market modules.

Life module

The mortality risk sub-module would increase as SB business grows.

Any guaranteed death benefits (SB business) not covered by the policy fund value would increase the required capital through mortality rates shock.

The disability-morbidity risk module would also increase as IP business grows. This will result through the morbidity rates shock.

The disability-morbidity risk module would also increase as IP claims emerge. This will result through the recovery rates shock.

As business with life and morbidity risk increases (along with premiums, claims and expenses) through growth of these two new products the SCR through the following risk sub-modules would also grow:

- Life catastrophe
- Expense
- Lapse

Any guaranteed surrender benefits (SB business) not covered by the policy fund value would increase the required capital through the lapse shock.

There shouldn't be any risk in the longevity risk and retrenchment risk sub-module and this shouldn't change.

Market module

Impact on market risk sub-module would increase in line with growth of reserves.

More likely to be impacted by SB product and claims in payment (CIP) reserves on IP product.

We do not know the actual asset mix of the company, but we would expect an increase in the interest, equity and property risk sub-modules to the degree that these asset classes back the liabilities for the new products.

CIP reserves are likely to be backed by government bonds and as such the interest rate risk sub-module should grow quicker relative to the other classes as claims emerge.

Assets backing the SB business would be invested in line with PPFM and PRE and these classes (and SCR related to them) should also grow as business grows.

The insurer may assume that management actions can take place under the stress scenarios, including changes to future bonus rates on policies with discretionary participation features (in line with PPFM).

Based on information available one can't assess the impact on currency risk, spread & default risk or concentration risk.

Without there being any annuity business there should be no illiquidity premium risk and no change to this.

The MCR is the defined minimum amount of capital to be held.

- iii. Discuss the concerns the company might have in launching these two new products in the current South African environment given the deteriorating economic conditions; the impact of the downgrading of South Africa's sovereign credit rating to "junk"; and the COVID-19 pandemic.**

This question was answered reasonably well by most candidates.

Current poor economic conditions leading to retrenchments, higher levels of unemployment and reducing levels of disposable income.

This scenario would generally lead to depressed new business volumes. Need to consider impact of launching new products into a market with lower demand.

This scenario would also tend to produce lower persistency. Need to consider impact of sales costs not recovered through potentially higher early duration lapses.

Temporary income (job) loss through impact of pandemic / lockdown will also result in persistency issues.

Income Protection products also tend to have worse experience in times of economic downturn. Is this the correct time to be launching this product? Would the pricing assumptions take the economic scenario into account?

We would also expect to see higher mortality and morbidity claims. The level of additional claims would have a high level of uncertainty.

The impact of these claims scenarios on the products should be considered. Will the company be writing new business at an expected loss – if so, how significant?

The pandemic may result in selection against sickness and income products. Need to ensure underwriting can cater for this risk.

This would be particularly important for products with short waiting periods, e.g. 7 days.

With the significant economic pressures fraudulent claims could also increase.

Poor GDP growth also reflects poor returns on JSE. The pandemic and downgrade are also causing high levels of market volatility.

Need to consider the potential returns on the new SB product. What is the outlook for returns over the next 1 to 5 years? How does this tie in with PPFM and PRE?

How would this compare with established competitor funds that may have built up BSR's over the years?

Consumers may prefer the SB product given the current levels of volatility in the market.

Need to consider bond rates / yield curve. Cost of Income Protection product linked to government bond rates due to the CIP reserves usually being backed by government bonds.

Yield curve is subject to various external forces such as changing inflation, Government policy, downgrade etc.

The downgrade will put upwards pressure on the yield curve as SA bonds are excluded from the World Government Bond Index and bonds are sold off. (to the extent that it hasn't been priced in already)

Treasury buying bonds would put downward pressure on the yield curve.

Increase in yield curve would reduce reserves as the discount rate linked to the bond rate would increase, and vice versa.

Would need to ensure that pricing incorporates a suitable discount rate given the general volatility in the level and shape of the yield curve currently.

Changes in bond rates / yield curve could result in changes to the SCR through the interest rate shocks. Impact on business as a whole would depend on size of Income Protection book at the time.

The company would need to monitor inflation or real rates as Income Protection policies normally increase with inflation once in claim.

Currency volatility would also potentially impact the company, but we do not know what the foreign currency exposures are in terms of assets held or policies denominated in foreign currency.

QUESTION 2

Two years ago, a South African life insurer launched a new funeral product. The sum assured is payable on death only. Initially the valuation basis was set equal to the pricing basis and has not been reviewed since the launch. The funeral product was expected to generate significant profits for the insurer. The valuations actuary is considering the latest valuation results of this product.

i. Outline the reasons for analysing the change in surplus for this funeral product?

This question was answered well.

The actuary will want to analyse the change in the surplus (AoS) for the funeral risk product for the following reasons:

- The AoS shows the financial effect of divergences between actual experience and expected experience, on the valuation basis.
- Since the valuation basis still reflects the initial pricing basis of two years ago, these divergences might be significant.
- The AoS also shows the financial effect of writing new business. For example, new business profit (or loss) and the contribution to covering the overhead expenses of the company.
- Various elements of the analysis of surplus process can provide powerful checks on the valuation data and results, including the checking of items of surplus for reasonability as well as various consistency checks.
- The analysis may assist in the distribution of surplus to the shareholders by identifying items of surplus that are unlikely to recur.
- The trends in the items of surplus may give useful information on trends in the experience of the funeral product.
- New items identified in the analysis may be used to inform the risk identification process.
- The AoS provides information which will assist in setting future valuation assumptions. A review might be necessary, since the basis has not been reviewed since the launch two years ago.
- To analyse the effect of policy alterations.

ii. State the sources of surplus that will commonly arise for this funeral product?

This question was answered reasonably well. Better candidates picked up on the reserving and valuation assumption points which many candidates surprisingly missed.

Note the term “expected”, as used in the analysis of surplus context, refers to the experience that would have emerged had the valuation assumptions, set at the start of the year, been borne out.

The following are the sources of surplus that will commonly arise for a funeral product:

- Since the funeral product is expected to generate significant profits for the insurer, we would anticipate new business profits. Unless negative reserves are not being allowed in the valuation basis. (i.e. Negative reserves are being made zero, to avoid premature recognition of profits)
- Release of any valuation margins (award marks for reference to compulsory and discretionary margins under IFRS or the risk margin under SAM). The most significant will probably be the mortality and expense margin added to the best estimate assumption.
- Actual vs. expected investment return
- Actual vs. expected expenses
- Actual vs. expected mortality
- Actual vs. expected lapses
- Actual vs. expected tax
- Other policy alterations/changes
- Exercise of options and guarantees.
- Change in valuation assumptions. This might be significant since the valuation basis has not been changed since the launch of the product two years ago.
- Consistent observed experience variances may indicate where the valuation basis may require some adjustment.

QUESTION 3

The latest version of the South African professional guidance regarding embedded value reporting was published towards the end of 2018 and introduced some changes.

- i. State the main reason for this update and describe the change in the professional guidance regarding the liability valuation basis underlying the embedded value calculation. (You are not required to refer to the asset valuation basis)**

This question was answered either well or poorly. Candidates who understood the need to change the EV guidance due to the introduction of SAM, and the falling away of the SVM which was used as a basis in the prior guidance, were able to craft a reasonable answer with suitable detail.

The actuary should consider APN 107 requirements, regarding embedded value reporting.

This practice note has been updated for the introduction of the new Solvency Assessment and Management (SAM) regime, which replaced the previous SVM methodology.

APN 107 V8 effective from 31 December 2018.

Version 7 of APN 107 prescribed that insurers should use the statutory valuation basis (i.e. SVM at that stage) as the liability basis underlying the EV calculation.

But Version 8 of APN 107 allows insurers some flexibility in choosing the liability basis underlying the EV calculation. The liability basis may be, for example based on IFRS, SAM or another basis.

The methods used to calculate the shareholder cash flows underlying the *EV* should be disclosed.

It should be made clear that the cash flows are based on the release of margins under the chosen liability basis, which could differ from the published accounting basis and/or the SAM basis.

The guiding principle to be applied is that there should be consistency between how profits are reported on the chosen liability basis and the profits that are valued for EV purposes, to ensure that there is no double counting or omission of shareholder cash flows.

A life assurer is considering the definition of new business when calculating the value of new business for embedded value reporting purposes.

ii. Discuss which business should be included and excluded, by referencing the latest South African professional guidance.

This question was answered surprisingly poorly. Many candidates could not set out how this would practically apply to different types of policies with different terms and conditions, e.g. group business, automatic increases etc. Many candidates limited their answer broad points around “making a sale and receiving a premium in the reporting period”.

APN107 defines new business as covered business arising from the sale of 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.

Typical examples of one-off premium increases, in respect of in-force business, defined as new business include:

- The continuation beyond the original term of individual policy contracts with a fixed maturity date (unless continuation of a proportion of maturities has previously been assumed when calculating the *PVIF*);
- Non-contractual premium increases at the request of the contract owner;
- Renewable single premiums; and
- Premium increases arising from new benefits that are added to existing contracts.

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.

The projected cash flows used to calculate *PVIF* should anticipate the *renewal* of in-force business, including any reasonably predictable variations in the level of *renewal* premiums but excluding any value relating to future new business.

Variations in future premiums relating to in-force business are reasonably predictable when assumptions regarding their amount and timing can be made that are consistent with other projection assumptions and based on reliable evidence. Where such predictions are made, any future variation in premium levels relating to such contracts should be treated as variance in experience of in-force business rather than as new business.

Typical examples of *renewals* (and reasonably predictable variations in *renewal* premiums) are:

- The continuation of contracts beyond the minimum term of an open-ended contract, i.e. those contracts with no specific end date;
- Renewable recurring premiums under Group Assurance contracts like PHI and Group Life Assurance;
- Automatic regular increases (whether the level is specified or not, and whether they are contractual or take place unless the contract owner specifically cancels them) in recurring premiums even though they may not be included in the calculation of the liabilities; and
- Increases in premium due to new members or salary increases under Group contracts.

Any variation in premium on *renewal* of in-force business from that anticipated, including deviations in contractual increases and re-pricing of premiums for in-force business, should be treated as an experience variance on in-force business and not as new business.

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

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).

A mature South African life assurer has produced the draft “embedded value: analysis of change” figures shown opposite for the last 6 months. They are compared against the published figures for the previous 12 months. This is part of a review of the draft results for the last 6 months.

Liability reserves are calculated on a prospective basis. The economic basis is determined by adding (or deducting) fixed differences to (or from) the risk-free return. There were no changes to these fixed differences when setting the economic assumptions for the last 18 months.

- iii. Describe the checks to be performed in the review. For each check:**
- **show any high-level calculations you would perform;**
 - **note any questions you would ask the valuations actuary who produced the draft; and**
 - **state possible reasons for the deviations from the previous 12 months.**

(You are not required to relate the investment and economic related items of change to the actual experience in the South African economic environment. You can limit your answer to the information provided in the question).

This question was answered poorly. Many candidates only achieved the most basic points on some of the items in the analysis. Candidates also showed a lack of understanding in how some of the items in the analysis could have been impacted by others, or used to explain changes in others. Many candidates also interpreted investment variances as actual returns and as such alluded to positive and negative returns rather than returns that were higher or lower than expected.

Check start EV values (on 01/01/2020) is equal to end EV values (on 31/12/2019) of the previous period.

- End ANW = Start ANW, which is correct.
- Cost of required capital start value R 1 mil (=2 648-2 647) more than end value, this is probably a rounding issue. Ask valuations actuary to ensure that start values equal end values of previous period.
- Start PVIF is R 50 mil (=26 376 -26 426) less than End PVIF of previous period, this is a significant difference, probably an error in the Start PVIF. Ask valuations actuary to ensure that start values equal end values of previous period.

Check the value of new business for the last period (6 months) vs the previous period (12 months).

- VNB for last 6 months is 44% (=201/456) of the VNB for previous 12 months. It seems low, would expect approximately 50% for a mature company.
- Check if new business premiums decreased to the same extent.

- Any changes in the mix of new business or new products launched which explains the apparent low VNB.
- Did the business plan for a decrease to this extent?
- The new business strain (Transfer from ANW) for last 6 months is 75% ($=330/441$) of the new business strain for previous 12 months. The same ratio for VNB is the 44%.
- This may indicate a lower new business volume on a similar new business expense base, which would then increase the new business strain (Transfer from ANW).
- Also consider any significant re-pricing exercises.

Check the Expected return (Unwinding of risk discount rate) for the last period (6 months) vs the previous period (12 months).

- PVIF unwinding is 52% ($=1427/2750$) of the previous 12 months.
- Expect this to be slightly higher, because the start PVIF is higher than for the 12 months. Increase in start PVIF is 5,8% ($=26\,426/24\,973-1$). [Remember the Start PVIF (on 01/01/2020) should be equal end PVIF (31/12/2019)]

Therefore, expect PVIF unwinding for the 6 months to be closer to R 1450 mil ($1455=2750*1.058/2$)

- This estimate ignores changes in the risk discount rate.
- Cost of required capital unwind is 56% ($=150/270$) of the previous 12 months. This is reasonable, given the increase in the start cost of required capital.

Check the Expected profit transfer from PVIF to ANW for the last period (6 months) vs the previous period (12 months).

- Expected profit transfer from PVIF to ANW is 54% ($=1\,490/2\,773$) of the previous 12 months.
- This is in line with expectation, since the increase of start PVIF is 5,8% ($=26\,426/24\,973-1$). Check: 50% (allowing for 6 months) \times 105,8% (allowance for PVIF growth) = 53%.

Check the Operating experience variances (relative to opening assumptions) for the last period (6 months) vs the previous period (12 months).

- Operating experience variances can be volatile from one year to the next. There may not be a clear relationship between the operating experiences of one year with the next year.
- Operating experience variances (transfer to ANW) for the 6 months (R 331 mil) seems high vs R 506 mil for the previous 12 months.

- Request the valuations actuary to quantify (with reasons) the positive experience variances.
- A potential reason can be risk decrement profits.
- Consider whether this is a once-off experience variance or whether this is a trend that needs to be monitored. If the trend continues, the valuation basis should probably be changed.
- Other operating experience variances (PVIF and Cost of required capital) are approximately 53% of the previous 12 months. It seems reasonable. These numbers are less significant in the total EV-build up.

Check the Operating assumption and model changes for the last period (6 months) vs the previous period (12 months).

- There may not be a clear relationship between the operating assumption and model changes of one reporting period with the next reporting period.
- Any operating assumption changes should reflect the trends in operating experiences variances.
- The positive impact of the operating assumption and model changes is consistent with the positive operating experiences variances. But checking the size of the changes is not possible without more information.
- Request the valuations actuary to quantify (with reasons) the operating assumption and the model changes.

Check the Expected return on ANW for the last period (6 months) vs the previous period (12 months).

- This reflects the expected return on the ANW (as opposed to the actual return) based on the valuation assumptions. These assumptions relate to the assumed asset allocation of the assets backing required capital and the expected return per asset class.
- Expected return on the start ANW is 3.5% ($=430/12\ 150$) for the 6 months. This seems a reasonable after-tax return for a prudent investment mandate of assets backing required capital.
- It is also 50% of the expected return on the start ANW of 7% ($=860/12\ 350$) for the previous 12 months. This seems reasonable ignoring any economic basis changes.

Check the Investment return variances on in-force covered business for the last period (6 months) vs the previous period (12 months):

- PVIF: This reflects the impact of the actual return (vs the expected valuation assumption returns achieved on policyholder's assets) on the PVIF.

-PVIF: It was positive (R 250 mil) in the previous 12 months and negative (-R 50 mil) in the last 6 months. This indicates an over and under performance of relative the valuation assumptions in the two periods considered, which may be reasonable.

-PVIF: Ask the valuation actuary to quantify (with reasons) the extent of the over and under performance. It seems like a small (approximately 1%) over and very small under performance (compared to a PVIF of approximately R 25 000 mil to R26 500 mil).

Check the Investment return variances on ANW for the last period (6 months) vs the previous period (12 months):

- This reflects the impact of the actual return achieved vs the expected valuation assumption returns on assets backing the ANW.

- As for the policyholder assets described above it seems that the ANW outperformed (R 123 mil) the expectation in the previous 12 months and underperformed (- R 30 mil) the expectation for the last 6 months.

- Ask the valuation actuary to quantify (with reasons) the extent of the over and under performance. It seems like a small (approximately 1%) over performance and a very small under performance compared to the ANW of approximately R 12 000 mil.

Check the Effect of economic assumption changes for the last period (6 months) vs the previous period (12 months):

- All products are prospectively valued, as opposed to retrospective valuations. Therefore, economic assumption changes will have impact on both ANW and PVIF.

- The decrease in ANW (- R 890 mil) in the previous 12 months, indicates an increase in prospective reserves. This might be due to a decrease in the valuation discount rates (assuming positive reserves), which will explain the decrease in ANW.

- The increase in ANW (R 250 mil) in the last 6 months, indicates a decrease in prospective reserves. This might be due to an increase in the valuation discount rates (assuming positive reserves), which will explain the increase in ANW.

- The increase in the valuations rates in the last 6 months seems to be in the region of 30% of the decrease in the previous 12 months. For example, a 0.3% increase in the last 6 months vs a 1% decrease in the previous 12 months. Check this against the valuation discount rates.

- The change in the PVIF of between 10% and 20% of the ANW impact, but in the opposite direction seems sensible. These changes in PVIF represent the value of valuation margins being released or created when the reserve is being released or created.

Embedded value earnings of R2 725 mil for the last 6 months translates into a Return on EV of 7.6%, which is 15.8% on an annualised basis. This is higher than the 12.5% of the previous 12 months. The main reason for the higher ROEV is the fact that the negative economic basis change for the previous 12 months (R 785 mil) did not recur.

The interim dividends paid in the last 6 months (R 1 080 mil) are less than 50% of the final dividend paid in the previous 12 months (R 3 260 mil). It is standard practice for companies to be cautious, not to over declare interim dividends based on good interim results.