

**Actuarial Society of South Africa**

**Examiners Report**

6 October 2009 (pm)

**General Insurance Specialist**

## Question 1

i. **Comments:**

*This was a pure bookwork question. Many candidates failed to add the liability requirements that forms part of the solvency requirements.*

**Answer:**

The current solvency requirement: On any given day the assets as valued and admissible in accordance with the Act must exceed the sum of liabilities as valued in accordance with the Act plus an additional amount. The additional amount is the greater of R3 million or 15% of the greater of the net written premiums for the 12 months immediately preceding the calculation date, or the 12 months of the previous financial year. Companies also have to keep a contingency reserve equal to 10% of net written premium for the 12 months preceding the calculation date.

The calculation of liabilities must allow for:

- Outstanding claims as per financial statement
- IBNR at a minimum of 7% of NWP unless dispensation is obtained from FSB
- URR if agreed with auditor  
UPR using 365<sup>th</sup> method or other approved method from FSB

ii. **Comments:**

*This was pure bookwork and most candidates answered this fairly well. However, the question asked to outline the **principles** relating to an investment strategy, and some candidates concentrated less on the principles but rather on which investments the company should hold.*

**Answer:**

The mean term of the assets and liabilities should be determined and the insurer should be aware of the consequences of departing from a matched position.

Some claims are subject to inflation and in those circumstances it is necessary to select assets in which to invest the technical reserves that are expected to increase in line with general inflation. It is important that the insurer must at all times be able to meet the liquidity requirements of the business.

When deciding on the types of assets needed to cover the Solvency Margin (minimum capital required) an insurer should avoid all significant risks.

Any excess reserves (above the minimum required) should be invested in a way that is likely to produce a good long-term return for the shareholders.

The following issues should be taken into account:

- The size of the insurer.

- The volatility of the asset class
- The actual level of the solvency margin relative to any statutory requirements
- The balance between the needs of the policyholders versus the shareholders. The insurer has a duty to the policyholders to invest wisely to protect its ability to meet its liabilities to them. The insurer also has a duty to the shareholders to sustain and enhance the return that it achieves on the investments.
- The marketability of the asset
- The admissibility of the assets as prescribed in the Act
- The spreading requirements as prescribed in the Act

iii. **Comments:**

*Some of the candidates used all the information given to formulate their answer, while others ignored the information and answered extremely generic. They therefore did not answer the question that was asked. No marks were given for a generic discussion of risks because the question referred specifically to the risks faced by Company Star.*

**Answer:**

Star’s exposure is spread across 5 lines of business with fairly similar premium volumes, except for the Cell Phone business. This provides good diversification in the risk position of Star Insurance.

The 2008 underwriting results for Star are as follows:

Line of Business	Net Written Premiums 2008	Underwriting Margin	Underwriting Profit
Cell Phone Insurance	R25 million	1-0.93	R1.75 million
Commercial Property	R300 million	1-0.93	R21 million
Commercial Motor	R250 million	1-0.975	R6.25 million
Engineering	R 300 million	1-1.12	-R36 million
Liability	R150 million	1-0.85	R22.5 million
<b>Total</b>	R1025 million		R15.5 million
<b>U/W Margin</b>			1.5%

Star Insurance showed a small overall underwriting margin in 2008.

Solvency Margin

The current solvency margin is 25.37%. Although this exceeds the minimum requirement of 25% of Net written Premium, the margin is very low and the FSB will start asking for longer term solutions.

The main reasons for the solvency strain are:

- Aggressive growth over the last 3 years,

- The reinsurance structure

Each of these aspects will be discussed in further detail.

The company has experienced substantial growth over the last 2 years. All the lines of business, except cell phones, have more or less doubled in premium volume over the last 2 years with fairly high loss ratios. The Cell phone insurance is a fairly new line of business which is marginally profitable.

The non-proportional reinsurance structure will not provide capital relief. Because of the high loss ratios and the low solvency margin, the company may not be able to absorb the retention (depending on how high this is) if they suffer a couple of large losses.

The company uses non-approved reinsurers. Only approved reinsurance is taken into account to determine the net written premium for solvency calculation purposes. The net written premium can therefore be substantially reduced if Star Insurance uses approved reinsurance or if the reinsurer furnishes security in the form of

- Money in the Republic with the company on which the company has a prior charge and lien or
- An irrevocable guarantee or a letter of credit issued by a bank against losses which may be occasioned by the failure of the reinsurer to discharge its obligations or of the termination of the policy.

For capital management reasons the reinsurer might be unwilling to deposit funds locally. This adds to the capital strain.

#### Investment Policy

The investment strategy is risky for a company with such a low solvency margin, especially the property investment and the investment in the non-listed engineering subsidiary and the listed equities. It is very difficult to liquidate the property investment in the current economic climate. The engineering subsidiary has a high loss ratio and the investment in the non-listed subsidiary can only be recorded as the net asset value of the subsidiary. The net asset value of these types of business is usually very small.

The company holds a substantial amount of investment in equities which are fairly volatile and not suitable for a company with solvency strain. Government bonds or other fixed interest investments will be less volatile.

Because the company is not listed they can only raise additional capital via the main shareholder. They can also attempt to raise capital through new shareholders, banks, debt markets, etc. However, given the tight solvency margin, only equity and reinsurance are viable options. Asking the main shareholders to invest more capital might be a problem depending on how much capital the shareholder has available and their commitment to the business. If they believe that the return on their investment is inadequate, they might decide to sell the business. All lines, except Engineering, have made an underwriting profit. If

- growth is curtailed,

- the losses in the Engineering business are substantially reduced,
  - Star Insurance can improve their underwriting performance in the other lines,
  - and the equity investment performance improves,
- the solvency strain can be relieved by retained earnings.

#### Reserves

The 7% IBNR is probably inadequate for engineering, liability and commercial property. If the company has a very conservative philosophy in setting outstanding claims reserves this might subsidize the low IBNRs. However, under FCR Star Insurance will have to increase the reserves to the 75% sufficiency level that will probably provide bigger capital strain.

The Engineering class has made an underwriting loss in the last financial year. The sum of the loss ratio, commission and expense ratio is 112%. Most engineering policies are term policies with the premium paid up-front. It is recommended that an unexpired risk reserve is calculated in consultation with the auditors. Alternatively, Star Insurance should sell the engineering business, although it is unlikely that they will be able to recoup their initial investment. Another option is to stop writing any new business and let the subsidiary go in run-off.

iv. **Comments:**

*Again many candidates gave a very generic explanation of the different models (prescribed, certified and internal). Unless the answered specifically dealt with how this will affect Company Star and the director’s comment no marks were awarded.*

**Answer:**

The board members statement is not valid because of the following reasons:

- The company has to be solvent now. Future FCR is not relevant in terms of current regulation.
- Does the company have an internal model currently that shows lower capital?
- Has the model been peer-reviewed to make sure that all risks are catered for adequately in the model?
- Have they contacted the FSB for approval?  
Is the internal model integrated into the business to ensure that they will pass the use-test?

If the company has to use the prescribed method it will probably not provide capital relief because of the following issues:

- it currently does not take any non-proportional reinsurance into account in the capital calculation
- Star Insurance is fairly small in terms of premium volume and the prescribed model is very penal for smaller companies.

If an internal model is built it might also not provide capital relief because:

- Reserves have to be held on the 75% sufficiency level. For the cell phone business this level might be lower than 7% of NWP but for engineering, commercial property and liability this will probably increase the reserves.
- Engineering, commercial property and commercial motor is very exposed to catastrophe risk. If inadequate reinsurance is purchased to cover the 1 in 200 year event the capital requirement will increase.
- The investment risk for Star Insurance is high because of the substantial investment in equities and because of the current volatility in the markets.
- Depending on the quality of the reinsurers on the reinsurance program, credit risk might also be high.
- If the retention levels in the RI program are fairly high, the underwriting results can be very volatile which will lead to a high underwriting risk capital charge.

v. **Comments:**

*The question specified that the loss ratio was defined as net incurred claims over net written premium. It was therefore not necessary to include the movements in the outstanding claims reserve and IBNR to get to an incurred claims amount. Net incurred claims are the predicted premiums for 2009 multiplied by the predicted loss ratios. If one wrong calculation was made the candidate was not penalized for subsequent errors because of one incorrect number used. Most candidates did not calculate investment income or tax. A few candidates were also not sure if the commission was included in the expense ratio, however the commission ratios were given and it is clear from the information given that the expense ratio was too low to include commission.*

**Answer:**

Assumptions:

- The percentage paid for reinsurance stays the same.
- The IBNR and outstanding claims reserves stay on previous levels. Investment return is achieved on the average balance of the technical reserves held at the start and end of the year.
- No URR is created for Engineering
- Assume all investment income on surplus reserves consists of dividends which are tax free
- Assume the surplus at the end of next year will be enough to improve the solvency with 10 percentage points.

Current solvency =  $260 / 1025 = 25.37\%$

Net written premium =  $(1.05 * (25 + 300 + 250 + 150)) + (0.9 * 300) = 1031.25$  million

Improve margin to 35.37%:  $0.3537 * 1031.25 = 365$ . Need to retain  $365 - 260 = 105$ .

$$\text{Opening unearned premium provision} = 0.6 * 1000 = 600$$

$$\text{Closing unearned premium provision} = 0.6 * 1005 = 603$$

$$\text{Movement in UPR} = 603 - 600 = 3$$

$$\text{Net Earned Premium} = 1031.25 - 3 = 1028.25$$

$$\begin{aligned} \text{Claims Incurred} &= (0.65 * (25 * 1.05)) + (0.6 * (300 * 1.05)) + (0.7 * (250 * 1.05)) + (0.72 * (0.9 * 300)) \\ &+ (0.58 * (1.05 * 150)) = 675.56 \end{aligned}$$

$$\text{Commission} = (0.2 * (26.25 + 315 + 270 + 157.5)) + (0.125 * 262.5) = 186.56$$

$$\text{Expenses} = (0.08 * 26.25) + (0.13 * 315) + (0.15 * 262.5) + (0.15 * 270) + (0.07 * 157.5) = 133.95$$

$$\text{Net Underwriting Results} = 1028.25 - 675.56 - 186.56 - 133.95 = 32.18$$

$$\begin{aligned} \text{Policyholder funds at the beginning of the year} &= \text{UPR} + \text{outstanding claims reserve} + \text{IBNR} \\ &= 600 + (0.2 * 689.25) + (0.07 * 1025) = 809.6 \end{aligned}$$

$$\begin{aligned} \text{Policyholder funds at the end of the year} &= \text{UPR} + \text{outstanding claims reserve} + \text{IBNR} \\ &= 603 + (0.2 * 675.56) + (0.07 * 1031.25) = 810.3 \end{aligned}$$

$$\text{Investment income on technical reserves} = (809.6 + 810.3) / 2 * 0.10 = 81$$

$$\text{Investment on surplus reserves} = (260 + 365) / 2 * 0.15 = 46.88$$

$$\text{Total Investment Income} = 81 + 46.88 = 127.88 \text{ million}$$

$$\text{Operating Profit before tax} = 32.18 + 127.88 = 160.06 \text{ million}$$

$$\text{Tax} = 0.28 * (32.18 + 81) = 31.69$$

$$\text{Operating Profit after tax} = 128$$

It will be possible to increase solvency to 35%, given that all the assumptions are correct. The results are very dependent on the investment returns. If the 10% and 15% cannot be achieved then it may well not be possible to increase solvency through retained earnings.

## Question 2

- i. **Comments:**

*Most candidates answered this question fairly well, although not all candidates considered a solvency margin of just over 25% as dangerously low. Candidates should avoid repeating information given in the question – this does not earn any marks.*

**Answer:**

Ajax Insurance Company has a statutory solvency of 26.7% (barely solvent) and expects continuous growth.

The business is only moderately profitable, so it is not likely to grow surplus through retained earnings to support its growth.

Ajax writes to fairly large liability limits and they do not have enough net assets to sustain a couple of large losses.

The rapid growth in premiums usually causes

- A drain on surplus
- More volatility in the loss ratios because new business usually runs at higher loss ratios

Ajax has a fairly risky investment strategy and a sudden drop in the stock market will cause the absolute value of the investments to drop.

Ajax has a concentration of risks in Gauteng and is therefore very exposed to a catastrophe in that area.

Ajax can benefit from technical assistance from reinsurers especially with liability pricing.

Ajax needs

- Capacity because of large liability limits,
- loss ratio stability because of rapid growth and
- surplus relief because of rapid growth and low solvency margin.
- Catastrophe Cover with multiple reinstatements

ABC Insurance Company is much smaller than Ajax Insurance and small insurers usually need more reinsurance than larger insurers.

ABC has a solvency ratio of 50%. Depending on the size of the technical reserves, equities can go to zero and the company will still be solvent.

Therefore ABC does not have to worry specifically about a drop in investment income or a drop in the value of the policyholder net assets.

The company has enough net assets but writes to fairly large limits on a volatile line of business. ABC can benefit with technical assistance from reinsurers because the frequency of PI claims is low.

ABC on the other hand needs

- Mostly capacity because of large limits per policy.
- Loss ratio stability because of large limits per policy

ii. **Comments:**

*This question was answered fairly well and flowed naturally from the previous question. Although most candidates realized that Ajax Insurance Company needs solvency relief, they did not know that a pure quota share does not provide solvency relief.*

**Answer:**

Ajax Insurance Company has a statutory solvency of 26.7% (barely solvent) and expects continuous growth.

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Ajax needs

- Capacity because of large liability limits,
- loss ratio stability because of rapid growth and
- Surplus relief because of rapid growth and low solvency margin.
- Catastrophe Cover with multiple reinstatements

ABC Insurance Company is much smaller than Ajax Insurance and small insurers usually need more reinsurance than larger insurers.

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The company has enough net assets but writes to fairly large limits on a volatile line of business. ABC can benefit with technical assistance from reinsurers because the frequency of PI claims is low.

ABC on the other hand needs

- mostly capacity because of large limits per policy,
- loss ratio stability because of large limits per policy

iii. **Comments:**

*This question was pure bookwork which should make the question fairly easy. However, a few candidates did not even attempt the question and nobody scored particularly well. This might be an indication that students ran out of time.*

**Answer:**

The cost of reinsurance can be allowed for in the premium in one of two ways, either:

- as the net cost of reinsurance (net of claims cost) in a premium based on a gross risk premium, or
- As the gross cost of the reinsurance in a premium based on a net risk premium.

In situations where only a small proportion of the gross premium is passed to the reinsurer it is normal for the first approach to be used. The net cost will arise because the reinsurer will want to cover its own expenses, profit margin etc.

With high level excess of loss or catastrophe reinsurance, the claim frequency is expected to be low but the claim amount high. In these cases it is usual to calculate a net premium allowing for reinsurance recoveries and then add the cost of the reinsurance to the premium as an expense loading.

In proportional reinsurance the reinsurer pays a ceding commission to the insurer.

The net commission (difference between commission paid to brokers and commission received from reinsurer) must be taken into account in the pricing.

If a profit commission is payable to the reinsurer this must be taken into accounts in the net commission calculation to add to the rates.

### Question 3

**i. Comments:**

*Most students did well on this question. Because the issue of Mzansi products is so topical in South Africa, most working students might have been exposed to discussion about this type of product. Students applied their knowledge of the South African environment well.*

**Answer:**

New, therefore no historical data

Aim is to make cover as affordable as possible.

Pricing is uncertain, unknown risk features of the new group of policyholders.

Ability to risk rate is likely to be severely limited as this may make the product unaffordable to many policyholders.

Traditional rating approaches may not apply. Manual input required.

May need to price considering market rates for current lowest insured LSMs and extrapolate even lower.

No industry data available for comparison

Rates must be very low. Hence low margins and possibly very competitive

Losses on this business have implications for cost of capital required to write it. Providers of capital may not accept lower return on equity.

Expenses may play a significant role

The take-up and future volumes are uncertain. High volumes lead to new business strain. Low volumes imply a smaller base over which to spread overheads and limited profits.

Verifiability of policyholder information

- Official address not always exist
- How to verify income level
- How to verify value of sum insured and property – cost of assessor likely to be impractical
- How to keep track of changes in policy holder information

Levels of fraud may be higher than usual

Possibility of willful damage to property

Traditional rating factors may not be as appropriate, given the different nature of risk

Premium collection:

- Not always have bank accounts. Thus debit order is difficult
- Collection of cash premiums is administratively difficult

Policyholders may be sensitive to cost of insurance, especially in difficult economic circumstances.

Retention and churn levels may fluctuate wildly.

Premium income may not be as certain as with typical policies.

Policy documentation should be very simple to accommodate typical levels of literacy of prospective policyholders

Policyholders may not understand the nature of insurance and may have unrealistic expectations of the insurer

Due to price/cost aversion of the typical policyholder, anti-selection may be significant

Alternative distribution channels may need to be developed. For example:

- Community or peer group marketing may be used, where existing policyholders are paid referral fees for bringing new individuals to the insurer.  
However, this may again give rise to moral hazard. Individuals may sign up friends simply to gain referral fees, simply to leave again thereafter.
- Post Offices/Retailers

Marketing methods may need to be very different from before. E.g. mail shots may not be appropriate.

Covered peril may differ from that of a typical short term insurance policy.

Type of policy = likely to be highly regulated, given the social aspect.

By growing this book of business quickly, significant marketing costs may be incurred. This may strain the profitability of the products sold initially.

Claims underwriting may be severely limited due to the costs involved with assessing damage  
Claims payouts may be administratively difficult & costly if policy holder does not have a bank account.

Reinsurance may not be easily or affordably available for such a niche product

Concentration of risk may occur if properties are situated close together e.g. informal settlement

Risk profile may be significantly different e.g. high fire risk

Exclusions may be difficult to enforce – risk are generally expected to be sub-standard as compared to typical policies.

Catastrophe risk exposure high e.g. floods where settlement next to rivers etc.

Language, cultural barriers: explain excess, deductible

Companies may want low-income products to gain BEE credentials, without considering policyholders.

The product has to meet the policyholders’ needs

It is difficult to gauge policyholders’ needs due to limited experience of the market and limited contact with the potential policyholders.

Given social aspect of the policy, profit margins may be viewed negatively.

This product may need to be subsidized by other products. Problem if the company wants to grow this significantly.

Other regulations may apply to these type of policies. E.g. SAIA may have developed low-income policy guidelines.

This product may cannibalize the existing client base if some of the existing policyholders who qualify decide to take it up. Not a major risk though.

ii. **Comments:**

*This question was reasonably well answered.*

**Answer:**

Sasria is mandatory

As such a component of the premium would need to be set aside to purchase Sasria cover. This might influence the affordability of the product.

Exposed to the risk that Sasria rates might go up unexpectedly

The policy must still contain certain specific exclusions to meet Sasria policy requirements e.g. exclude war risks.

Explain to policyholder – may be illiterate & not understand Sasria

iii. **Comments:**

*This question was reasonably well answered, although few candidates could produce enough marks to score more than 50% for this question.*

**Answer:**

It would not be appropriate simply to load the premium for the additional capital requirements

The capital should be provided by the owners of the company (e.g. share holders)

The profits made on the policies should normally be sufficient to service the additional capital requirements.

However, in this case the margins may be very small and the policies may possibly even be loss making.

The company may be pursuing the product more from a desire to be socially responsible or to improve its BEE scores.

The cost of capital may therefore not be met for these policies due to lower return on capital.

As such the premiums should be loaded for the costs of capital associated with the additional capital requirement

The cost of capital should be determined through reference to the investment returns earned and that demanded by the providers of capital (e.g. the shareholders).

The additional product sold may introduce some diversification in the insurer’s business. This may have a reducing effect on the capital requirement.