Actuarial Society of South Africa

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Subject A301 — Actuarial Risk Management

PAPER TWO

EXAMINERS' REPORT

This subject report has been written with the aim of helping candidates. This report summarises the main points that the examiners were looking for and some common problems encountered.

QUESTION 1

Examiner's comments:

- *Question required students to think about the merits of using reinsurers and why one would be better suited over another; this required a little more higher order thinking than just the standard bookwork for*
- *Students generally scored well with the stronger students scoring full marks*
- *Many students listed factors without explaining the factor – these only scored half marks*
- *Disheartening to see how many attempts had remarks about unscrupulous behaviour from reinsurers, bad press etc. and choosing which reinsurer was the "best of a bad bunch" – reinsurers offer a valuable service to insurers and the industry, with high ethical and financial credibility*

1. Profit share terms – maybe one offered terms and the other didn't or the one offered better terms
2. Guarantee period of reinsurance rates – one with the longer guarantee period would be better
3. Relative financial security of two reinsurers – one with higher credit rating would be a better choice
4. Current relationship with two reinsurers – you would be inclined to work with the one you have a better relationship with; but you might also feel too exposed to one reinsurer already and might select the other for that reason
5. Relative technical expertise of the two reinsurers – hard to measure; might also be based off what they promise
6. Additional services offered by the reinsurers – underwriting or claims assistance; help with data analytics etc
7. Other terms of the agreement – underwriting & claims referral levels (level of freedom granted to insurer)

(8. Commission terms – there might be commission offered by one of the reinsurers and not the other)

QUESTION 2

Examiner's comments:

This bookwork question was quite well answered as candidates could correctly define each of the three money market instruments, but left out the points around the different interest rates that could be applied to the instruments. Very few discussed the level of certainty of cashflows for each option. Some lost marks for not clearly explaining the term deposit, suggesting that the capital is available after a pre-defined term and not correctly stating that this is the maturity date of the investment, this not being an open-ended instrument like a call or notice deposit.

Call deposit

- cash placed on deposit with the depositor having instant access to withdraw the capital

Notice deposit

- cash placed on deposit with the depositor having to give a period of notice before withdrawal

Term deposit

- cash placed on deposit for a fixed term with no access to the capital sum earlier than the maturity of the deposit

- the highest interest rate is usually offered for term deposits with call deposits getting the lowest interest rate
- this is because the depositor has easy access to funds with a call deposit but no access for a term deposit
- the interest rates could be fixed for the term , fixed for an initial period or variable throughout the term
- the level of certainty of the cash flows is dependent on how fixed the term and interest rates are

QUESTION 3

Examiner's comments:

The question was asking for advantages and disadvantages of CIS. This is bookwork straight out of the notes and the candidates were able to identify many of the points. The solution required candidates identifying the main advantages and disadvantages of CIS in general, not particular types of CIS (e.g. discussing discount to NAV or gearing for an Investment Company).

<u>Advantages</u>

- They are useful for obtaining specialist expertise.
- They are an easy way of obtaining diversification.
- Some of the costs of direct investment management are avoided.
- Holdings are divisible – part of a holding in any particular trust can be sold.
- There may be tax advantages.
- There may be marketability advantages (but they may also be less marketable than the underlying assets).
- They can be used to track the return on a specific index.

<u>Disadvantages</u>

- Loss of control – the investor has no control over the individual investments chosen by the managers.
- Management charges are incurred.
- There may be tax disadvantages such as withholding tax, which cannot be reclaimed.

QUESTION 4

Examiner's comments:

i. *This bookwork question was poorly handled by most candidates. Though the question only asked for an elaboration on the role of the regulator wrt ensuring that financial promises are met, a lot of candidates introduced and commented on other roles of the regulator unrelated to this function. In addition, a surprising majority of candidates could not distinguish between reserves and capital, with a lot of candidates stating that capital (rather than reserves) represents the financial promises to policyholders.*

ii. *This was a bookwork question which was handled well by well-prepared candidates.*

i.

- Regulator monitors the adequacy of provisions that an insurer sets aside to meet future liabilities
- They usually prescribe the basis (assumptions and methodology) by which these amounts are calculated
- As the future is uncertain, the regulator usually requires a margin to be held above the best estimate basis
- In addition, the regulator usually wants the insurer to hold additional free capital as a buffer for general adverse experience

ii.

Pillar 1 – quantification of risk exposures and capital requirements

- Includes rules for valuing both the assets and liabilities (provisions)
- Determines two levels of capital requirement being Minimum Capital Requirement (MCR) and Solvency Capital Requirement (SCR)
- MCR is the threshold at which companies will no longer be permitted to trade
- SCR is the target level of capital below which companies may need to discuss remedies with their regulator
- Both the SCR and MCR must be held in addition to the technical provisions
- The SCR may be calculated using a prescribed standard model or a company's approved internal model

Pillar 2 – Supervisory regime

- Both Pillar 2 & 3 deal with the qualitative aspects of Solvency II
- This covers the company's internal controls and risk management processes
- It will include regular monitoring by the regulator and supervisory visits

Pillar 3 – Disclosure requirements

- Covers the disclosures needed, both publicly and also privately to the regulator

QUESTION 5

Examiner's comments:

i. *Question was not answered well. Candidates seem to know the basic terms like diversification but could not explain clearly what those terms meant in this situation.*

ii. *Question was generally quite well answered. Candidates scored quite highly. The question was quite straightforward and the answer was directly from the notes. Many students made us of a pneumonic to remember the answer. Some blindly applied the pneumonic without applying it to the question.*

i.

- The main reason is probably because the fund managers believe they can get a higher return from the overseas investments

- This additional return could be due to higher risk opportunities

- or the fund managers could be expecting the Rand to depreciate

- Overseas investments can also reduce risk through increasing the level of diversification through

  investing in different industries and companies and/or
  investing in countries with a low degree of correlation to the SA market

- Other possible reasons to use overseas investments include:
  - there may not be enough suitable assets available in SA
  - the tax situation may favour overseas investment

ii.

1. Exchange rates change unexpectedly
2. Liquidity problems especially related to the currency
3. Irrecoverable taxes paid in foreign country (e.g. Withholding taxes)
4. Less information available than in the SA market
5. Language differences
6. Time zone differences
7. Poorer market regulation
8. Risk of adverse political developments
9. Restrictions on ownership of certain shares
10. Complex administration e.g. a multi-currency accounting system; need for a custodian etc
11. The need for specific expertise to invest overseas
12. Additional costs of various forms

QUESTION 6

Examiner's comments:

i.

It was surprising how poorly many candidates fared with this question. Performance was typically better on identifying advantages, but candidates struggled to think of disadvantages, most focusing mainly on increased costs. Many also suggested that nurses aren't well enough qualified/trained, which is untrue, especially when it comes to standard underwriting questionnaires (for which they are trained) and the drawing of bloods. Some picked up on the nurses not knowing the medical history of the applicant, which is a significant advantage the GP has in the process. Almost no one noted the reputational/brand risk should nurses misrepresent the insurer, and conversely the brand promotions that can be achieved. Very few noted that the nurses are strangers to the applicants and that they may not trust/be comfortable with the nurses.

Many candidates went into detail describing the consequences of a particular advantage/disadvantage, and this resulted in them not identifying a sufficient points to score well as this does not answer the question.

ii

I think this question was misunderstood/poorly interpreted by many candidates. Those that identified the appropriate bookwork list and explained the points, scored well. Some merely listed the items and were penalised. Many included "claims controls systems" which is not applicable at the new business stage which was specifically asked for. Many candidates picked up on the clue that other forms of underwriting other than medical underwriting also exist, and where these were explained, candidates scored well. Many focused on the design of the application form and capturing of data, the distribution process, communication and regulation. There were some marks available for this, but without using the correct bookwork list, candidates struggled to gain many marks.

i.

Advantages:

- Their time is likely to be cheaper than a doctor's
- They have received specialised training from the company…
- …and hence they would be more consistent in their treatment/capturing of client information…
- …whereas the wide variety of doctors may have heterogeneity in their responses.
- They are travelling to the client at a time and place convenient for them…
- …as opposed to having to fit in with a doctor's schedule.
- The nurses are already representing the company…
- …and this visit may introduce another opportunity to market the life office (leave a good impression).

Disadvantages:

- The nurse is a stranger to the client…
- …whereas the doctor is someone the client knows and is comfortable with.
- The nurse doesn't know the client's complete medical history…
- …whereas a GP is uniquely placed to comment on this in detail.
- If there are complicated disclosures of past medical problems…
- …it is likely that the client will then have to travel to a doctor for further disclosure anyway.
- Nurses are in the employment of the company which requires additional HR admin burden…
- …and in cases of low new business volumes are still required to be paid.

ii.

Diversification of new business

- This can be by line of business…
- …or area…
- …or target market
- This will ensure a spread of risks / reduce concentration of risk

Financial underwriting

- This will reduce the risk of overinsurance
- …which in turn will reduce moral hazard and/or anti-selection…
- …as well as (arguably) help with improving persistency
- It can also help with reducing fraudulent claims

Lifestyle underwriting

- A client's lifestyle can also influence his mortality/morbidity as a result of the following:
- Applicant's occupation…
- …leisure pursuits…
- …and country of residence
- Underwriting for clients' lifestyle will remove claims from events that are difficult to price for…
- …or provide the cover at a cost commensurate with the extra risk

Management control systems

- The company would like to ensure that the quality of data captured at new business is of a very high standard…
- …as this will enable them to analyse/monitor their experience better.
- …which should lead to corrective action sooner
- Good control systems will enable them to monitor the nature and size of liabilities taken on…
- …and ensuring they are within the resources of the company

Product development?

QUESTION 7

Examiner's comments:

i

- *A relatively challenging question with a disappointing number of students answering with the standard investment classes – the question clearly asked for equity related investments (no marks awarded for property investment, cash and government bonds etc.)*
- *Few students drew distinctions between listed and unlisted company's share investment*
- *No student mentioned the "combination of the above" category and therefore lost those marks*

ii

- *Majority of students scored well on this question with many getting full marks*
- *Some students used the equally acceptable $V = D / (i - g)$ where D is the dividend payable in one years' time, and full marks awarded*
- *A few students incorrectly stated the D_0 was next years' dividend, or that d was the dividend rate*

iii

- *Many students scored well here*
- *Poorer attempts listed factors not related to the equation (investor sentiment for example)*
- *No marks were awarded for remarks stating that the share needs to be held in perpetuity to realise the value. The equation sets a price / value for the share in today's terms, and does not mean the investor needs to hold it forever to be awarded this value (they could sell it at that price in today's terms)*

i.

<u>Invest directly in a portfolio of listed shares</u>

This option will require choosing a basket of listed shares that is in line with the company's return objectives and risk appetite. This (and some of the below) options can either be actively or passively managed. Some challenges might include that diversification might be difficult if the asset pool is not big enough (given that this is a newly established company).

<u>Invest directly in a portfolio of private equity</u>

This option is similar to the first option above, but focus on unlisted companies. Challenges here include the fact that company information and performance is not as readily available as for listed companies – it might therefore require more effort and almost surely a certain level of expertise. Unlisted shares are also generally speaking more illiquid, which might be a concern for a small company (with likely capital constraints). Private equity investments typically require a more hands-on approach from a management perspective – something which is unlikely to be reasonable for your company. The diversification concern raised above is also relevant here.

Get the required exposure via derivative structures

Combinations of options, futures or warrants can also be utilised to get exposure to the required equity markets. Although this does not require direct investment in the equity markets, one can get indirect exposure to the required asset class. This option will almost surely require high level of sophistication and expertise as derivatives are usually fairly complex structures.

Invest via a collective investment scheme

A wide range of collective investment scheme options are available, some of which will give the required exposure to the equity markets. Options might include exposure to the wider equity markets (all share), or alternatively to subsections of the market (small cap, mid cap, top 40, etc). This investment option is likely to have the least practical issues (at least initially while the insurance company is growing) as it relies on expertise of the scheme manager (as opposed to inhouse), allows for smaller investment sizes, etc.

Invest in a combination of the above

Any combination of the above investment options can also be considered. The practical issues will then be a combination of the above, and expertise will be required to decide on which blend should be utilised.

ii.

$$V = \frac{D_0(1+g)}{i-g}$$

D0 is the most recent dividend received.

g is the constant dividends annual grow rate

i is the required annual rate of return

iii.

- The value of i will need to be estimated
- The assumption of a constant required rate of return i over time might not be appropriate during an era when the yield curve is steeply sloping upwards or downwards
- The growth rate g is also unknown and will need to be estimated
- In practice it might be felt that constant dividend growth is not a realistic assumption
- The results obtained are very sensitive to the assumed level of i-g of i – g
- The equations for the dividend discount model ignore tax
- This model assumes annual dividend payments even though the payments might be half-yearly on individual shares

QUESTION 8

Examiner's comments:

- *Part (i) was generally answered well with the majority of candidates earning a decent mark.*
- *Part (ii)'s responses were generally disappointing. The vast majority of candidates simply provided the bookwork for the "Detail Appraisal" section of the core reading and as a consequence focused more on the <u>process</u> of the detailed appraisal as opposed to discussing the actual factors that will influence the decision - very little application (almost none) of the context of the question were incorporated into the response. This approach was not rewarded in the marking process, which means the overall performance of this question was quite poor. Candidates are strongly encouraged to ensure that any response, especially for a "Discuss" question, should always be adapted with the context of the question in mind. Other common mistakes were assuming that the expansion is for a financial company, and hence referring to reinsurance or other financial-related concepts that should be irrelevant to a gym- and nutrition-provider.*
- *Part (iii) was answered reasonably well.*

i.

An initial appraisal will take place to assess whether the project seems likely to satisfy some fundamental criteria set by the organisation. Given that the major factor considered in this context is to improve their earnings profile , the main aspects considered will be whether this can be achieved by the expansion – hence, can income be generated at a higher level/pace than the increase in expenses.

Therefore, main considerations will be whether sufficient additional income can be generated , and whether the costs incurred in the expansion is reasonable and affordable.

Other major considerations might include whether it fits in the strategic direction of the company (compatibility) , or whether any material risks might emerge (political or other). Furthermore, is this the best use of scarce investment funds and resources?

ii.

At the heart of this project is a need to improve the earnings profile of the company , and hence the focus should be on the profitability of the project – revenue and expenses.

<u>Revenue considerations</u>

This will primarily depend on the demand for the products they intend to sell. Assuming that they intend to bring out similar products to those sold in the local market, they need to study the suitability of those products for this market and consider how they need to be adapted.

One risk is therefore that the products and services that they offer do not meet the needs of the new target market – they might not be interested in the gymnasium facilities, or might not have the time/capacity to utilise these facilities. Furthermore, the nutrition products might not meet their specific nutrition needs as the company might not understand the current dietary consumption and needs of the new market.

The company should therefore ensure that they understand whether the needs in the new countries are similar to those in the local market if they intend to offer the same product offering. In addition to this, sections of the population with sufficient disposable income will need to be identified and targeted.

Pricing will need to take into account the level of affluence in the new cities and the price of alternatives. A broad decision will be needed as to whether to aim for a similar upmarket product or to go for a cost-effective mass-market offering. The product offering (and pricing) will need to be adjusted accordingly.

Are there any significant competitors in the market that offer a similar product or service? This might influence how the product need to be positioned, but might also affect the pricing of the offering.

Expense considerations

The setup costs of new facilities and shops will need to be carefully considered. The investment required for these might be material (costs of gymnasium equipment, rental contracts for shops, hiring of staff, etc.), and this might negatively impact the earnings profile initially as revenue will only be earned over time. Funding of these upfront costs should also be carefully considered, as well as the cost of such funding. One might need to consider the sources of funding – will it be from within the company's reserves/funds, or will it be sourced in the local countries. These might introduce additional risk to the operations. This will almost surely put some initial pressure on the earnings profile.

A careful analysis of other expected ongoing costs will be needed. The most significant are likely to relate to salaries/wages and property (rent or construction). The availability of a labour force with the necessary skills might be an issue.

Other considerations

The political situation will need to be analysed. A view will be needed on future stability and whether changes could cause a problem. Furthermore, how will the new market react to a foreign company entering their market?

Compliance with local regulations and customs e.g. employment or planning law and advertising could incur a cost or delays due to bureaucracy.

It will also be necessary to consider currency risks.

iii.

- If the company is considering a project with a degree of systematic risk higher than is usual for its projects, the discount rate used should be greater than that which the company normally employs.
- A suitable upward adjustment is therefore made to the cost of capital in order to reflect the higher level of systematic risk.
- One might consider the discount rates appropriate for use by other companies that habitually engage in such projects.

In practice such data may be hard to obtain and there may be no alternative but to make an arbitrary addition to the discount rate.

QUESTION 9

Examiner's comments:

Part i of the question was pure bookwork and well prepared students received high marks for this part of the question.

Surprisingly, not many students explained the features of the personal accident policy correctly.

With the last part of the question, the students that followed the standard risk management framework in generating their answer did well with this part of the question.

i.

Through risk management a provider will be able to:

- avoid surprises
- improve the stability and quality of their business
- improve their growth and returns by exploiting risk opportunities
- improve their growth and returns through better management and allocation of capital
- identify opportunities arising from natural synergies
- give stakeholders in their business confidence that the business is well managed
- price products to reflect the inherent level of risk
- improve job security and reduce variability in employee costs
- detect risks earlier meaning they are cheaper and easier to deal with
- determine cost-effective means of risk transfer.

ii.

- Personal accident is a type of general insurance product…
- …that usually pays a fixed amount…
- …in the event of a loss of a limb
- …or another type of injury.
- It is not meant operate as a type of indemnity cover/insurance

Underwriting risk

…e.g. the company is not charging the correct premiums for the level of risks they are accepting/underwriting

…e.g. the company does not have adequate underwriting standards in place and hence taking on more risk that what was priced for.

Insurance risk (or claims incidence risk)

…e.g. the company suffers more claims than anticipated

Financing risk

…e.g. AccSure invested money in a new distribution channel (or system, or product etc.) and it fails to generate a return on the investment made

Exposure risk

…e.g. AccSure suffers multiple claims from the same industrial accident/event, because they had multiple insureds at the same location

iii.

Measurement of the risk

- The company would need to determine how likely such an event is to happen (i.e. frequency)
- This can be difficult, given that these type of operational risks tend to happen quite infrequently…
- …but one can perhaps look at whether any such events happened to the industry/competitors in recent years
- As well as get some expert opinion on how likely it is to happen.
- Given that the event happens, the risk committee/management would need to determine what the likely financial loss might be as a result.
- This might be as a result of fines/penalties or lost business etc.

Control of the risk

- The company would need to decide on measures to mitigate the risks or the consequences of risk events.
- They can for example looks at ways to reduce the probability of the risk occurring…
- …for example by installing the best possible IT security systems
- The can consider ways to limit the severity of cyber-attacks when they happen…
- …by having an action plan ready (or doing real life-drills or training…
- …or setting the systems up in such a way that only parts of the business can be compromised at any one point in time.
- They can reduce the financial consequences by taking out insurance…
- e.g. Cyber liability cover

Financing the risk

- AccSure would need to calculate the cost of all the measures it takes to manage cyber risks…
- …as well as the costs of insuring some of the risk.
- This needs to be compared to the cost(s) of the effects of the risk event occurring.
- It is likely that not all of the costs of a cyber-attack will be recouped from an insurer.
- …and hence the element of self-insurance will also need to be included in the overall amount required to carry this risk.

Monitoring (of the risk)

- Any actual occurrences of the risk should be investigated in detail.
- AccSure would need to regularly review and re-assess their exposure to a cyber-attack…
- …and whether there have been any new developments in this regard that they should be aware of.
- They would also need to make sure that any exposure they still have is within the risk appetite of the organisation…
- …especially if the risk itself has perhaps changed over time
- They would also need to make sure the measures/control put in place are still sufficient/effective…
- ….and that the level of any insurance they obtained is still adequate…
- …and the best value for money.