

INSTITUTE AND FACULTY OF ACTUARIES

EXAMINERS' REPORT

April 2017

Subject CA1 – Actuarial Risk Management

Paper Two

Introduction

The Examiners' Report is written by the Principal Examiner with the aim of helping candidates, both those who are sitting the examination for the first time and using past papers as a revision aid and also those who have previously failed the subject.

The Examiners are charged by Council with examining the published syllabus. The Examiners have access to the Core Reading, which is designed to interpret the syllabus, and will generally base questions around it but are not required to examine the content of Core Reading specifically or exclusively.

For numerical questions the Examiners' preferred approach to the solution is reproduced in this report; other valid approaches are given appropriate credit. For essay-style questions, particularly the open-ended questions in the later subjects, the report may contain more points than the Examiners will expect from a solution that scores full marks.

The report is written based on the legislative and regulatory context pertaining to the date that the examination was set. Candidates should take into account the possibility that circumstances may have changed if using these reports for revision.

Luke Hatter
Chair of the Board of Examiners
July 2017

A. General comments on the *aims of this subject and how it is marked*

1. The aim of the Actuarial Risk Management subject is that upon successful completion, the candidate should understand strategic concepts in the management of the business activities of financial institutions and programmes, including the processes for management of the various types of risk faced, and be able to analyse the issues and formulate, justify and present plausible and appropriate solutions to business problems.
2. This subject examines applications in practical situation of the core actuarial techniques and concepts. To perform well in this subject requires good general business awareness and the ability to use common sense in the situations posed, as much as learning the content of the core reading. The candidates who perform best learn, understand and apply the principles rather than memorising the core reading.
3. The examiners set questions that look for candidates to apply the principles specific to the situation set out in the questions, having read the question carefully. Many candidates gain few marks by writing around the subject matter of the question in a more general fashion. Detailed specialist knowledge is not required and nor is very detailed development of particular points.
4. Good candidates demonstrate that they have used the planning time well to understand the breadth of the question and to structure their answer – this is a big advantage in making points clearly and without repetition. This also enables candidates to use the later parts of questions to generate ideas for answers to the earlier parts.
5. Time management is important so that candidates give answers to all questions that are roughly proportionate to the number of marks available.
6. The comments that follow the questions concentrate on areas where candidates could have improved their performance. Candidates approaching the subject for the first time are advised to use these points to aid their revision.
7. Candidates who give well-reasoned points, not in the marking schedule, are awarded marks for doing so.
8. In this diet the scoring for the exam was done out of 200 and therefore the mark scheme shows a total of 200 marks available for the paper.

B. General comments on *student performance in this diet of the examination*

1. The standard of the answers to this paper was consistent with previous sessions. Better candidates planned out their answers, particularly for the longer questions and were rewarded because there was less duplication in their answers and their planning ensured they thought widely enough to score well.
2. As per previous sessions the application questions were mixed in that those that were structured scored well, whereas those that didn't had problems providing sufficient depth into their answers.
3. Bookwork questions were answered well compared to the April 2016 session, with most candidates scoring well.

C. Pass Mark

The Pass Mark for this exam was 59.

Solutions

Q1 All three investments are real assets. [1]

For each will need to consider cashflows, marketability and risks as these will differ. [1]

The tax situation is also likely to differ for each. [1]

(a) One house will need management. The house will probably need to be let to new students each year and so the costs of upkeep and repair may be high. Once let, the investor should receive a regular income (investor should ensure there are guarantors). [5]

It is likely to be expensive to buy. [1]

There may be a risk of voids if the house/area becomes less attractive to students. [1]

The marketability will depend on many factors, particularly location. If the area becomes less popular with students it may still be able to be sold as an ordinary home or for rental to non-students. Capital values may be volatile. [3]

The individual will have control over this investment. [1]

There will be no diversification with one house. [1]

- (b) This investment will be fully managed so the investor will not have to spend additional time on this. Payment for this management is, however, likely to be expensive. [2]
- Investor will have no control over this investment. [1]
- There should be regular income but may need to check if there are any guarantees on capacity. What will happen if the rooms are not let? [2]
- The location of the accommodation and its popularity with students will be critical. Preferences may change over time and it may not be suitable for other purposes. [2]
- There may be lower costs associated with the purchase. [1]
- This investment may not be marketable. [1]
- It may be divisible (unlike the house). [1]
- There will also be a concentration risk. [1]
- (c) There will be some diversification with this investment as the fund invests in a number of residences and these are likely to be in different locations. [2]
- There may be a partnership with the universities which will effectively give some guarantee of capacity and so income. [2]
- It will be fully managed and so no additional expenses. [1]
- There are likely to be high costs of upkeep and even replacement of halls of residences to ensure that they continue to appeal to students. This will reduce the income. [2]
- The investor will have no control over this investment. [1]
- This is a fund so the investment may be marketable and divisible. [2]
- The suitability of the investments for investor will depend on his appetite for risk (so related to age, liabilities, other assets held). [2]
- [Max 18]

This question was answered reasonably well with the stronger candidates recognising and using the situation. Candidates need to consider different perspectives to score well.

Q2 (i)

- Product Failure – firework not working in the anticipated way causing injury to consumers or not working at all – recall, refund, reputation damage. [4]
- Fire Risk for the factory (property damage) – explosions happening leading to large fire affecting both the factory and surrounding area. [2]
- Could significantly damage ability to meet orders if just one factory. [1]
- Injury to staff – burns or chemical injuries in the making of fireworks. [2]
- Costs too prohibitive – making the fireworks may be too costly to sell to consumers. [2]
- This could be due to costs of the powder required to make the fireworks, or other expense related risks. [1]
- Political Risk – government may ban the sale of fireworks (or even fireworks completely) meaning business risk failure. [2]
- Fireworks fall out of fashion – market plummets [1]
- Economic risk since fireworks could be considered a luxury [1]
- Liquidity risk as sales may be concentrated at certain times of year [1]
- Increased competition, either locally or internationally, leads to reduced business. [1]
- Increase in tax on fireworks [1]
- *Credit was given for other risks: credit, fraud, business, operational (related to fireworks)* [1]

[Max 6]

- (ii) (a) Here the risk would need to be trivial. [1]

For example low risk fireworks being made – minimal powder risks for fire etc. [1]

Alternatively the manufacturer may already have suitable insurance/guarantees from the government. [1]

The risk may be non-financial and there may be processes in place to deal with this. [1]

- (b) In this case, the risk would be material if it arose. [1]

- However, the manufacturer may think that the risks are unlikely to bite. [1]
- Or, they may have sufficient funds to cover any potential costs themselves. [1]
- Suitable alternatives may not be available or may be too expensive. [1]
- The company may be happy to take extra measures to deal with the risk. [1]
- The company may want to retain any upside of the risk. [1]
- (c) Essentially, the manufacturer is risk averse. [1]
- They believe that insurance is necessary since even if the risk is unlikely, its impact will be too great for them to cover. [2]
- Alternatively they may believe that they will be taking on significant risk but the premium represents value (and/or they can afford it). [1]
- This may be a legal requirement. [1]
- (d) Essentially risk averse but not as much as in (c). [1]
- The most likely scenario would be insurance with an excess to reduce the premium required. [1]
- This could be a trade-off between the likelihood and costs of minor incidents versus the saving in premium. [2]
- Alternatively, they may not be able to afford a full-cover premium. [1]
- Insurance companies may be unwilling or unable to accept the full risk. [1]
- [Max 8]
- (iii)
- Product Liability Cover
 - Public Liability Cover
 - Business Interruption Cover
 - Employer Liability Insurance
 - Property Damage Insurance
 - Contents Insurance
 - Catastrophe Insurance
 - Key Man Insurance
- [6]

1 mark was awarded for each product with a maximum of 6

[Max 6]

[Total Max 20]

- Part (i) This question was well answered with the stronger candidates tailoring their solution to the question.
- Part (ii) Many candidates failed to answer why each option might be chosen, meaning this part of the question was answered less well.
- Part (iii) Very well answered, but some candidates didn't consider the main concerns of the company and approached with a list of all the possible products which may not be required in this case.

- Q3** (i) The regulator may have considered this a prudent approach to ensure that member benefits are protected. [2]
- This is a relatively simple unbiased method and will be easier for the regulator to check these values. [2]
- This may be because regulation is new. [1]
- Or there may have been previous problems or general lack of confidence. Perhaps relating to illiquid assets. [2]
- The regulator may wish to discourage investment in unquoted assets. They may be difficult and subjective to value and possibly risky. [2]
- It may be hoping that this approach will increase confidence. [1]
- [Max 4]
- (ii) This approach may make it very expensive to fund schemes so may discourage employers from setting them up or continuing with them. [4]
- The returns on a scheme may be lowered which will increase the cost. This may lead to reduced benefits. [2]
- It may also reduce the demand for other assets, e.g. property, infrastructure which may have many negative effects on these assets. [3]
- They will not be able to take advantage of any high quality unquoted investments. [1]
- Market prices can be volatile. This may make it difficult to communicate and interpret the results. [2]

There is no distinction made between different assets (to allow for different quality/volatility). [2]

This approach will reduce diversification. [1]

The approach makes no reference to the valuation of liabilities. [2]

[Max 8]

(iii) The method and basis for any actuarial valuation will depend on the purpose of the valuation and the type of liability. [1]

It is important that the valuations of assets and liabilities are consistent. [2]

Assets could be valued at market value and liabilities valued at appropriate market based discount rates. [2]

Alternatively both assets and liabilities could be valued using the same interest rate, which would normally represent the long term expected return on the assets held to back the liabilities. [2]

Any market value implies an expected rate of return linked to the risk of the asset. Therefore it can be argued that the use of a single discount rate to value all assets and liabilities is inappropriate and different discount rates should be used depending on the risks within the assets and liabilities to be valued and possibly other factors such as marketability and term. [3]

Since few types of liabilities are marketable, the discount rate has to be based on that applied to those assets that most closely match the liabilities. Whether it is useful or not in practice to adopt such an approach depends on the purpose of the valuation. [2]

There may be practical problems if market values are volatile as it may be difficult to ensure that the liability valuation result is consistent with an unstable value of assets. [2]

There may also be problems if there is a change to the investment portfolio. [1]

One possible solution is to modify the method of valuing assets to make the value more stable and hence more consistent with a value of liabilities calculated using stable assumptions. Some sort of smoothed market value could be seen as the solution to the problem with market values. A more common method is the discounted cash flow method, using a long term interest rate assumption which is held relatively constant. [4]

Instead of changing the cashflows, the discount rate could be adjusted to allow for the risks associated with the assets [2]

[Max 12]

[Total Max 24]

Part (i) This question was generally well answered but some candidates failed to state obvious points and therefore missed easy marks.

Part (ii) The stronger candidates tailored the solution to the question and had clearly planned their answer.

Part (iii) The stronger candidates tailored the solution to the question and had clearly planned their answer. This was answered less well compared to part (i) and part (ii).

Q4 (i) Assumptions will be needed relating to:

- Mortality before retirement
- Mortality after retirement
- Future changes in mortality
- Future salary levels
- Future investment returns
- Future inflation rates (for benefit increases)
- Other decrements
- Assumptions relating to any options or guarantees

Award 1 mark for each assumption

[Max 6]

(ii) Different membership profiles and maturity. [2]

The structure of the scheme membership can have an effect on the assumptions used. For example, a scheme that is closed to new members will have a membership that will grow older as members retire, leave or die. [2]

Conversely, in an open scheme with a large active membership, it is likely that leavers will be replaced with new recruits, and thus that the average age of the active membership will be broadly unchanged. This assumption may generate a different future contribution rate than for the closed scheme. [2]

Different demographic characteristics of the scheme memberships [2]

For example the longevity assumptions may vary significantly due to occupation, regions and socioeconomic groups. [2]

Some schemes may have more knowledge about their membership (relating to health) than others. [1]

- One scheme may have a large number of smaller pensioner liabilities, versus a scheme with very few members with large pensioner liabilities. [1]
- Investment strategies may be very different. [2]
- Some schemes may adopt a matching approach, others may not. [1]
- One scheme may have a prudent investment strategy involving mainly bonds compared to another scheme more heavily invested in equities. [2]
- This could give an underlying difference in the investment assumption for the schemes. [1]
- Investment strategies containing large hedging holdings may reduce the importance of specific assumptions. [1]
- The schemes could be using different methods for valuing the underlying assets within the investment assumption. For example, one scheme could use market values and another could discount cash flows. [2]
- Scheme size may differ. [1]
- This may lead to different investments being available. [1]
- May also affect the quality of data available. Do they have their own data or will they need to use general data? [2]
- Strength of the backing employer, a strong employer may allow trustees to set a less prudent overall basis. [2]
- The funding approach may differ. [1]
- For example, some employers may be funding in advance and others just in time. [1]
- The trustees could also be aware of special one off profits that could be allocated to the pension scheme meaning they can differ on assumptions [1]
- This could come about in a number of ways – either through the actual assumptions themselves or this could enable them to invest differently as per above. [2]
- Different measures of inflation in the scheme rules needing different assumptions. [1]
- Some schemes may have caps/floors within their benefits and these could be valued differently. [1]

This could be that they have been hedged out, the floors/caps are being ignored or more detailed modelling has been done. [2]

There may be different assumptions. [1]

For example, relating to salaries if schemes operate in different industries. [1]

The scheme may have valuable guarantees and options attached. [1]

For example there may be an option to take part of the pension as a tax-free lump sum. This may be more valuable to most members, so that the majority choose it, even though they are forgoing a financial benefit by not taking all the proceeds in the form of a pension at a guaranteed rate. In this case it may be that the take-up rate for the full pension is less than 100%. Furthermore the take-up rate may be different depending on the purpose of the valuation and of prudence required. [3]

Some schemes may provide additional benefits. [1]

For example, could provide benefits to spouse. May be different percentages involved. [1]

Views of trustees [1]

Some trustees may consider some risks more concerning than others and therefore produce more prudent assumptions. [1]

The trustees' actuarial advisors may have differing views on the assumptions. [1]

For example expected rates of return on asset classes or longevity. [1]

This could be because of differing models to assess these risks [1]

or via judgement on use of models available e.g. CMI. [1]

The scheme could have differing views on the measures such as bond yields, noting that pension schemes are generally long term in nature. [2]

The scheme may have different legal views on the benefit specifications and approaches to equalisation as an example this could have material impacts on the funding level requirements of the scheme. [2]

The regulator may give guidance on the assumptions to be used and these could be interpreted differently – in particular on how to value assets. [2]

The schemes expenses may differ and hence there are different methods/assumptions for allowing for these in the funding level. Indeed in the extreme the sponsoring company could pick up these expenses. [2]

The scheme may have differing aims from the funding level, one could be trying to achieve derisking activities over time and hence deliberately holding prudent (buy out) funding levels to try and enable decisions to get to this level over time. [2]

Indeed one scheme may have already partially insured benefits and valuations are being used for this element of the scheme. [1]

[Max 22]

[Total Max 28]

Part (i) This question was well answered by most candidates.

Part (ii) This question was averagely answered with most candidates not considering the question from different angles and therefore a limited number of ideas were generated.

Q5 (i) The benefits of the protection scheme need to be balanced against the costs. [1]

It is necessary to balance the cost of the scheme across the parties involved. [1]

Increasing capital requirements does not necessarily reduce the risk of insolvency. For example, if the new protection scheme requires much higher capital requirements then the introduction of the new scheme can cause insolvencies. [3]

The cost of the scheme can be spread across:

1. Policyholders – Higher premiums or charges applied to policyholder funds. [2]

2. Capital providers – The ranking of capital provided on insolvency. [2]

3. Companies – Surcharges on surviving companies to provide benefits on insolvent schemes. There could be levies on all companies; these could be related to risk. [4]

4. State – May step in directly. Could provide direct insolvency support or underwriting support, for example to provide confidence in benefit schemes. This could be funded through general taxation. [4]

How any insolvency is managed is important as it will affect the ultimate cost of the protection scheme. [1]

[Max 10]

- (ii) For each, will need to ensure that the method used encourages confidence in the system. [2]

What were the expectations before the new scheme? [1]

Will need to consider the capital that may be available. [1]

Can also consider non-financial ways to reduce the likelihood of insolvency
E.g. regulation, education consumers. [2]

(a) **Arrange of long-term term assurance contracts**

Policyholders in poor health will not be able to get replacement cover. Terminating all contracts on insolvency could increase or decrease the cost of the scheme. Terminating the contracts passes the cost of not being able to get replacement cover back to the policyholders. If the policies can be sold on to another benefit provider all the existing policyholders continue to be provided with cover and this can realise a profit. This may raise more money for the insolvent company than terminating all policies. [5]

Could the sum insured be reduced? Would this be by the same percentage for all policyholders? This is again likely to affect those in poor health the most. [3]

The protection scheme could also consider nationalisation. [1]

(b) **Savings contracts providing a minimum guaranteed annual return**

Not guaranteeing any of the benefits may not fairly spread the cost of the scheme. [1]

Not guaranteeing any benefits can precipitate a “run-on-the-bank” and cause an insolvency particularly if assets are illiquid. The policyholders surrendering before insolvency will get full policy values with the cost of insolvency falling on the remaining policies. This is likely to pass the cost to less financially sophisticated investors who are likely to release their savings are at risk later and take slower action. [4]

Guaranteeing full benefits will spread the cost in full onto surviving companies or the state. This can protect against a “run-on-the-bank” causing an insolvency. However, this passes full cost of unreasonably higher guaranteed annual returns on to the state and absolves the policyholders from taking responsible decisions, particularly for financially sophisticated investors. Did the minimum guaranteed return look appropriate when the savings contracts were issued? Reducing unreasonably higher benefits, caps of guarantees will

balance the cost between policyholder and the cost of the protection scheme. [6]

The protection scheme needs to balance the cost between paying benefits immediately compared with continuing the contracts and earning future profits. [2]

(c) **Compulsory medical insurance contracts**

There is a need to distinguish between claims already made, claims during the insolvency and later claims. [2]

For claims already made not guaranteeing the claims passes the cost fully to the policyholders. This is at odds with a compulsory medical insurance contract that will spread the cost across policyholders. This applies similarly with claims made during the insolvency. [3]

Cancelling the contracts during the insolvency may effectively pass a cost of insolvency on to unhealthy lives if their cost of replacement cover increases relative to healthy lives. [2]

The cost can be shared between the parties by organising a transfer of all contracts to another provider. [2]

As these were compulsory contracts it may be reasonable to expect the state to step in and arrange cover. [2]

(d) **A staff defined benefit scheme**

If the staff defined benefit scheme ranks after policyholders and debt holders this may pass the cost of insolvency fully to staff, or it may pass the cost fully to any state protection scheme for defined benefit schemes. The design of the protection scheme needs to consider interaction with other schemes and how the cost is spread. [3]

May consider ranking members. Could provide full benefits to some (e.g. pensions in payment) and reduced benefits to others. Would need to consider how any reduction would operate (percentage of pension or maximum pension). [4]

Providing full protection to staff does not encourage the staff to soundly manage the company. This is particularly the case for senior managers. [2]

If there are state social security or means tested benefits then providing no protection to the benefit scheme would pass increased cost to the state.

[1]

[Max 20]

[Total Max 30]

Part (i) This question was answered reasonably well.

Part (ii) This part of the question was the least well answered question of this session, with few candidates scoring more than half marks. Most candidates did not directly address the question and therefore did not gain many marks.

- Q6** (i) Prize money for winning each match. [1]
- Gate receipts i.e. ticket sales for each match. [1]
- Concessions inside the ground at each match e.g. food, drink, programmes etc. [1]
- Other merchandising e.g. replica kits etc. [1]
- Media rights e.g. local TV or radio coverage. [1]
- Commercial sponsorship arising out of the cup run e.g. names on shirts, ground advertising. [1]
- New season tickets e.g. for next season. [1]
- Success may lead to grants from local authorities, trusts etc. to say upgrade ground – support for local club. [1]
- Offers to play friendly matches, exhibitions against good opposition – so generating future gate receipts say. [1]
- Subsequent sale of star player(s) – cup competition brings attention to them. [1]
- [Max 4]
- (ii) **Why**
- The club will want to optimise the revenue it receives that is getting as much as is practicable. [1]
- However, possibly more importantly, they will want certainty. That is to know how much they will receive in advance no matter how far they progress. [2]

They will receive the money in advance. This club may need this to fund expenses related to the competition (or other urgent immediate needs) [3]

There are many variables here and so the actual revenue received could fluctuate considerably – in particular, they would receive very little if they were to lose in the first round. [2]

In effect they are passing the risk of low revenue on to the investors – at the cost of upside potential if they were to do better than expected. [1]

By only selling part of the revenue, they are maintaining some exposure to the benefits of a long run – otherwise there may be less of an incentive to make the effort to progress. [2]

Risks

Clearly there is an opportunity cost in terms of limiting the upside potential of a long cup run – loss of high revenue. [1]

The price may be relatively low. Given the great uncertainty, e.g. first round could be a very strong side away from home or a weak team at home, the price investors will pay will be vastly reduced by a high risk premium. [3]

Likewise there may be very little interest from investors – not a large market and the club will be unknown to most investors. Hence they don't sell enough revenue to make it worthwhile. [2]

The security will probably be highly unmarketable adding another risk premium and so reducing price. [1]

They may end up with a price similar to expected first round revenue i.e. no real gain. [1]

There will likely be considerable expenses involved in setting up the arrangement, e.g. fees, due diligence, marketing and administration. Combined with a low price, the club may make a loss. [2]

There is a risk of dispute over which revenues are included, e.g. leading to court action – being sued. [1]

Hence very tight wording will be needed – costly to achieve. [1]

The arrangement may breach rules and so may not be allowed or it may introduce tax complications. [1]

There may be reputation risk if fans are unhappy with the arrangement. [1]
[Max 12]

(iii) They will need to use a cashflow model. [1]

In particular, they will need to estimate the amount of potential revenues, when they will be received and the probability of receiving them. [3]

A major assumption will be the probability of progressing from each round. This will be extremely difficult to predict especially if the draw hasn't been made. [2]

This is of particular relevance since revenues will increase from round to round i.e. a big difference depending on how far they progress – introduces a wide spread of potential outcomes. [2]

They will need to be clear as to when and how payments will be made to investors i.e. not practicable to pass it straight on – some administrative delay – maybe at the end of each month pay all revenues received in that month. [2]

They will need to be explicit about which sources of revenue will be included and how the three quarters will be calculated. Perhaps use an independent Trustee to administer and resolve disputes. [2]

For example, will payments be net or gross of tax and expenses. [2]

Some form of scenario analysis or variation in assumptions would be needed to allow for the high degree of uncertainty, i.e. get a range of possible outcomes e.g. good or bad cases. [2]

However, given the likely time and resource constraints (little of either) and the absence of meaningful data, complex modelling, e.g. stochastic analysis would not be suitable. [3]

To allow for the uncertainty, pessimistic assumptions may be used e.g. conservative over amounts and assume low probabilities of progress. [1]

Estimated payments will then need to be discounted at an appropriate rate to determine their value and hence a price. [1]

Given the relatively short term, the choice of discount rate may not be that material. [1]

A starting point would be the returns on money market products. [1]

Given the risks and uncertainty, a high margin over risk free rates would be appropriate. [1]

In effect, the product could be viewed and priced in line with “junk” bonds, i.e. high risk corporate, short term bonds. [1]

One the price has been calculated, consider the likely demand. Could adjust the price if necessary. [2]
[Max 14]

- (iv) Given, short term and uncertainty, it is unlikely that this asset would match any specific liability or be used for savings. [1]

Instead, it is a speculative punt with the possibility of a loss of a large part of the capital invested but with the chance of a high but uncertain return. [1]

Hence risk takers who seek short term gains and who probably have spare capital would be attracted by the opportunity. [2]

It could be attractive to supporters of the club – assuming that unit sizes were small enough for individuals. [2]

Also to other sports fans or members of the local community. [1]

However, given the circumstances, the price may not be much more than first round revenues (assuming very unlikely to progress) hence the downside is limited so appealing to more risk averse investors. [2]
[Max 4]
[Total Max 34]

Part (i) This was well answered.

Part (ii) This was reasonably well answered, but stronger candidates did well by making their answer more tailored to the question with points going into sufficient depth. Most candidates explained why, but few mentioned the risks.

Part (iii) This was poorly answered with only the stronger candidates going into enough detail. Too many impractical suggestions were given to this part of the question.

Part (iv) Few candidates gave more than one idea here, and hence this was poorly answered.

Q7 (i) **Specifying the problem** [1]

- including analysis of risks, including mitigations, and the problem seen from each stakeholder's perspective [3]

Need to know the aims and objectives of the insurance company for this product. Will need to know its success measure. [2]

Analyse the market to ensure product viability is possible, [1]

understand the needs of consumers, [1]

understand who the competition is and [1]

understand what if any unique competitive advantages the insurance company has that can be utilised for this product. [1]

Developing the solution [1]

- considering the models to be used [1]

- assumptions that will need to be developed for the health insurance product [1]

- Will need to collect and analyse data [1]

- interpretation of results – i.e. is the proposition viable [1]

- What level and form of benefit would be suitable [1]

- are there any alternative solutions available [1]

Will need to construct the health insurance product to meet the needs of the client, ensuring that it also meets the profit criteria of the insurance company. [2]

Monitoring the experience [1]

- Ensure model is dynamic such that it can be changed if required [1]

- and in particular to reflect any experience that it identifies. [1]

Company will need to review the sales of the health insurance product, with an understanding of the profits actually achieved. Will need to understand in depth the capital that it requires. [2]

Will need to show sufficient granular information on the demographics of the policyholders and understand where the sales and expenses are coming from. [2]

In all of this will need to feedback to management and refine the model adjusting for feedback received – that is a review of all elements of the cycle as required. [2]

It will be critical to review all assumptions and elements of the model on a regular basis. [1]

All stages of the cycle must be considered in the context of the relevant economic and commercial environment. In addition the requirements of professionalism must be recognised at all stages. [2]
[Max 16]

- (ii) Legislation/Regulation – any new health insurance product will need to comply with any legislation laid down by the government. [2]

State Benefits – need to consider whether there are any benefits already offered by the state, this would determine the need for the product and who to pitch the product at. [2]

Tax – any tax advantages (or disadvantages) for policyholders taking out this product. [1]

Accounting Standards – the insurance company will need to ensure it knows how to account for the product on its balance sheet. [1]

Capital Adequacy – need to ensure enough capital is available for the launch of the product. [1]

Corporate Governance [1]

Risk Management Requirements – does the insurance company have the ability to manage the risks of the product sufficiently? [1]

Commercial/Competitive environment – does the insurance company understand the market and where they could have a competitive advantage. [1]

Cultural/Social Trends – is there a likely change in demand for the product due to social and cultural changes in its target market? Is there a willingness to spend on this type of product? [2]

Demographic Changes – is this changing for its target market. [1]

General health of the nation – is this changing. [1]

Lifestyle Considerations – is there a requirement for health insurance products, and is the lifestyle of the population (more/less healthy – e.g. active) likely to change the benefits of the product to the target market [2]

Technological Changes – could the insurance company use new technology to understand its target market better and understand the health risks of individuals better at the underwriting stage, e.g. using Health Apps? [2]

Medical improvements may keep people alive longer in disability and may also cure people more quickly. [2]

Are there any new developments relating to health insurance products in other countries which could be useful? [1]
[Max 10]

- (iii) Some expenses can be identified directly as belonging to a particular class of business – in this case we need to consider the expenses directly attributable to the health insurance product. [2]

Others do not have a direct relationship to any one class of business. These need to be apportioned between the appropriate classes, i.e. what is apportioned to the health insurance product. (These are generally overheads.) [2]

Expenses need to be allocated to different types of business in as realistic a manner as possible. [1]

Direct expenses may arise from a department dealing purely (health insurance pricing team, sales team etc.) with one class of business, in which case the expenses relating to that department can immediately be allocated to the product. If direct expenses arise from areas dealing with more than one class of business then time sheets can be kept (either for a period or permanently) to help split costs between classes. [2]

The indirect expenses are harder to allocate. By definition, the departments concerned are not related directly to any particular class of business, but form a support function for the provider. In this case, it is necessary to find a sensible apportionment of the expenses across direct business activities. [2]

For some costs a “charging out” basis could be used – computer time and related staff resources could be charged to the health insurance product departments based on actual use. [2]

Premises costs can be allocated by floor space taken up by those working on the health insurance product. [1]

For other costs such as statutory fees or senior management costs a more arbitrary basis may be required. These costs could simply be added at the end of the analysis as a percentage loading to all the other attributed costs. [2]

As well as apportioning expenses to a line of business, costs need to be apportioned by function, so that they can be allowed for in determining product pricing or the provisions for future liabilities. [1]

For most types of business the high level division is into the costs of:

- securing new business, i.e. percentage of time selling the health insurance product rather than other products, or the pricing teams specific to health insurance. [1]

- maintaining existing business (renewal and investment) – this is likely to be very low at the start of the contract but will need some understanding of how this may increase over time so it can be added to the premium costings. [2]

- terminating business (including claims) – again likely to be low at outset. [1]

New business costs might be split into marketing; sales and commissions, processing and policy issue; and underwriting. [1]

An important element of any new product pricing process will be the inclusion of loadings for expenses. These are required to ensure that sufficient premiums are charged to cover not only the expected claim costs, but also the costs of expenses related to administration and claims handling for the business written on these rates, and provide a contribution to the general fixed costs of the provider. [2]

The loading for expenses could be allowed for as follows:

- as a fixed amount per contract
 - as a percentage of the premium charged
 - as a percentage of the sum insured
 - a combination of the above
- [1]
[Max 12]

- (iv) The alternative to the prescribed model is to build an internal model to reflect the specific risks that the health insurance business is taking on [1]

Using the model prescribed by the regulator (the standard model) will have many advantages.

The standard model would not require detailed work to be done on building the specific model required. [1]

There will also be considerable time and effort involved on the part the insurance company in reviewing and seeking approval for an internal model. There will also be costs involved. [2]

The company may not have enough data or experience to build its own model. [1]

The company may use the prescribed model for its other business. [1]

The prescribed model may fit well with the health insurance product and so could be appropriate. [1]

The insurance company would need to make sure that any model will be resilient over time, which will be easier with a standard model than with an internal model. Essentially the regulator would assist. [2]

A standard model may help address any concerns that the public may have with the company. This could lead to increased confidence in the new product [2]

May allow the insurance company to obtain regulatory approval quicker from the regulator as they will not need to review and approve the internal model along with understanding any specific risks. This would enable the insurance company to launch the product more quickly into the market. [2]

[Max 8]

[Total Max 46]

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| Part (i) | This question was well answered with most candidate getting most marks. |
| Part (ii) | This question was also well answered, with better candidates making their points relevant to the question. |
| Part (iii) | This was less well answered. Few candidates seemed to go into sufficient depth or breadth to score well on the expense allocation process. |
| Part (iv) | Answered less well with only a few candidates scoring more than half marks. This part of the course has had mixed answers for the last few sessions. |

END OF EXAMINERS' REPORT