INSTITUTE AND FACULTY OF ACTUARIES

EXAMINERS' REPORT

April 2017

Subject SA2 – Life Insurance Specialist Applications

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 Life Insurance Specialist Applications subject is to instil in the successful candidates the ability to apply knowledge of the United Kingdom life insurance environment and the principles of the actuarial practice of life insurance to a United Kingdom life insurance company.

2. The Examiners' Report covers more points than would be expected to get full marks. This is so that alternative approaches to questions by different candidates can be accommodated. Whilst candidates are expected to show knowledge of the relevant content of the Core Reading, it is much more important in this exam to tailor answers and apply that knowledge to the specifics of the question than it is in earlier exams.

3. Candidates who give well-reasoned points, not in the marking schedule, are awarded marks for doing so.

4. 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. Question 1 focussed on the Matching Adjustment. Whilst there is relatively little on the Matching Adjustment in the Core Reading, well prepared candidates were able to apply their wider knowledge to flesh out their answers.

2. There were a few low mark questions that were particularly challenging (question 1 parts (vi), (vii) and (ix)) where only the better prepared candidates scored well.

3. Question 2 considered some fairly standard issues and yet some candidates struggled to earn high marks. A good example of this was question 2 parts (vi) and (vii). A good understanding of the standard risks and consideration of the information in the question should have enabled a thorough answer to be provided.

C. Pass Mark

The Pass Mark for this exam was 61.

Solutions

Q1 (i) Any five of the following:

Risk of policyholders living longer than expected. [1]
Including in deferment. [1]
Insurance risk (or life underwriting risk) module. [1]

Risk that expenses are higher than expected. [1]
Insurance risk (or life underwriting risk) module. [1]

If the assets aren't matched appropriately to the liabilities … [1]
… then the company is at risk of adverse movements in yields/interest rates [1]
Market risk module [1]

Risk of spreads widening on corporate bonds held. [1]
Market risk module [1]

Risk of defaults on corporate bonds held *(or reinsurer default)*. [1]
Counterparty default risk module. [1]

Risk of losses arising from inadequate or failed internal processes, people and systems or from external events. [1]
Operational risk module. [1]
[Max 10]

(ii) This can be achieved by increasing assets or reducing the Technical Provisions or Solvency Capital Requirement. [1]
Raise capital [2]
e.g. through a rights issue, issuing a subordinated loan stock, reducing dividends [1 per relevant example up to 2]

Reduce the level of new business written… [2]
… assuming that it causes a net strain on the Solvency II basis [1]

Reduce the level of risk in the fund and so reduce the SCR [2]
This also reduces the Risk Margin. [1]
Take out reinsurance [1]
Purchase a longevity swap [1]

Improve the asset/liability matching… [2]
… particularly by duration/term [1]
Invest in assets which are in line with the yield curve required (to reduce gilt/swap mismatch), use interest rate swaps [1]
Reduce investment in risky assets… [2]
… such as corporate bonds [1]
Invest in high rather than low rated corporate bonds [1]
Use credit derivatives [1]

Reduce expenses [1]
Or expense variability [1]
e.g. by outsourcing / improved efficiency [1]

Reduce operational risks through improved governance / process documentation (*any one of the three examples earns the mark, not all three are required*) [1]
Staff training / business continuity plans *(any relevant example)* [1]
Start writing another product which offers risk diversification [2]
e.g. term assurances (*any relevant example*) [1]

Improve the precision of the risk margin calculation (if approximations have been made, and improving these would result in a lower value) [2]
Use policy by policy data rather than model points (if the latter are used and this would lead to lower liabilities) [1]

Use a matching adjustment [2]
If this is not permitted, use a volatility adjustment [1]
Move to internal model [1]
Diversification [1]
Especially to mitigate counterparty risks [1]
[Max 18]

[Comments in brackets for information only – not needed for the mark, as command verb is "suggest".]

(iii) (a) Immediate annuity business has long term… [1]
… and predictable liabilities … [1]
… because they cannot be surrendered. [1]
Matching assets can be chosen… [1]
… and these can be held to maturity. [1]
Hence the company is not exposed to the risk of changing spreads on these assets / liquidity risk. [1]

(b) Holding a matching adjustment increases the risk-free rates provided (i.e. the discount rate)… [1]
… so will reduce the technical provisions … [1]
as they are discounted at a higher rate. [1]
[Max 6]

(iv) The main impact will be on the market risk module. [2]

It is likely to reduce the spread/liquidity risk … [2]
… significantly. [1]
This is because the company can change the risk-free discount rate… [1]
… in line with the spread movements of the assets… [1]
… which relates to the liquidity element of the spread. [1]
So the company is only exposed to credit spread movements on the liabilities, [1]

which reduces the magnitude of the stress test. [1]

There may be an overall residual dampening of all stresses. [1]
e.g. insurance stresses [1]
…as a higher discount rate reduces the technical provisions [1]
…which will in turn reduce the magnitude of any stress. [1]

Overall, the SCR will reduce. [2]
[Max 8]

(v) The exercise will start from the existing shared portfolio of assets. [1]
It needs to identify the assets which best match the immediate annuity liabilities. [2]
This will involve projecting forwards the cashflows of the liabilities. [2]
… i.e. annuity benefit payments [1]
… and expenses… [1]
… on a best estimate basis… [1]
.. . and the cashflows arising from the assets… [2]
… i.e. coupons… [1]
… and redemption/maturity payments. [1]
Deductions should be made to allow for expected defaults / credit risk. [2]
These deductions may be done by credit rating. [1]
The company may perform the exercise on various scenarios/sensitivities. [2]
The matching will be based on duration … [2]
… and currency… [1]
… and nature… [1]
… e.g. any indexation (if index-linked annuities) [1]
The projection should be performed on a policy by policy basis… [2]
… and on an asset by asset basis. [1]
Additional data is likely to be required on each asset held. [1]
This would need to be obtained from the investment department. [1]
It may be possible to use the BEL model for the liability cashflow projections. [1]
It is likely that the company will have already performed an ALM exercise on the overall book of business. [1]
But may have to match more closely now. [1]
Might choose by size of spread for the Matching Adjustment. [1]
Or by yield to improve pricing. [1]
i.e. it also needs to take into account liquidity. [1]
The company may have to sell/purchase assets in order to optimise matching. [2]
And would need to take into consideration the transaction costs in doing so. [1]
Would need to consider exposure to single assets. [1]
If selling assets, may need to consider their liquidity and the time it may take. [1]
The company will need to take into account any restrictions imposed by the PRA on the type of assets which can be included. [1]
Any example [1]

The company will need to consider whether the approach allows sufficient flexibility for future rebalancing of the portfolio… [1]
… to allow for new business. [1]
The company may wish to check that the remaining assets are appropriate to hold against the deferred annuities. [1]
[Max 22]

(vi) **Model**
The actuarial projection model may need to be changed in order to cope with the matching adjustment. [1]
The model will now need to use a separate yield curve (or adjustment to the existing yield curve) for the business with a matching adjustment. [1]

Setting the matching adjustment
Need to develop an approach for determining the matching adjustment assumption. [1]
This will involve determining the spread on the portfolio of assets deemed to be matching the liabilities. [1]
And deducting the fundamental spread, which is an allowance for the credit risks retained by the insurer. [1]
Documentation will need to be updated. [1]
Processes will need to be updated []1

Transactions
Claim payments need to come from the right asset portfolio/sub-fund. [1]
Expenses need to come from the right asset portfolio/sub-fund. Overheads may need to be split between portfolio sub-funds/ [1]
May require new bank accounts to be created for the immediate annuity business to allow the above to flow correctly. [1]

Other
The company may hold the chosen assets in a separate portfolio. [1]
… in order to be able to determine a separate overall yield/spread/value more easily. [1]
Will need to separately identify any reinsurance arrangements which relate to the matching adjustment business vs non-matching adjustment business, and record it separately on the balance sheets. [1]
Needs to consider how to treat/split surplus assets. [1]
May need more information from the investment department. [1]
[Max 6]

(vii) The company will need to regularly rebalance the immediate annuity asset portfolio… [1]
… to ensure the assets are still an appropriate match for the liabilities. [1]
Especially after writing material levels of new business. [1]
It will be necessary to consider the frequency of rebalancing. [1]
This may require a transfer across of assets which are currently matching deferred annuities. [1]
Or it may require the purchase of new assets. [1]

It may become more difficult to find assets of appropriately long term. [1]
Or to find assets with sufficient liquidity premium for the Matching Adjustment. [1]
Particularly if there is a relative shortage of such issues in the market. [1]
All assets purchased would need to meet the PRA requirements. [1]
Existing assets may need to be sold in order to ensure continued matching. [1]
The management time and cost will need to be considered. [1]
[Max 4]

(viii) TAS D [1]
The data used in the determination of the adjustment should be fit for purpose/reliable. [1]
TAS M [1]
The model used in the determination of the adjustment should be fit for purpose. [1]
Insurance TAS (or TAS R) [1]
Relating to the determination and use of appropriate and relevant assumptions / that clear explanation can be provided of the approach taken to setting the adjustment [1]
[Max 6]

(ix) The matching adjustment has no direct impact on Solvency I liabilities… [2]
… so there may be no change. [1]
However, if the assets backing the liabilities have changed following the ALM exercise… [1]
… for example new assets purchased … [1]
… or different yielding assets are now assumed to back each of the immediate annuity and deferred annuity portfolios than before… [1]
… then the valuation rates of interest may change … [2]
which will impact the value of liabilities on an IFRS basis. [1]
A higher valuation rate of interest will reduce the liability value (and vice versa). [2]

If the assets that are now segregated for the immediate annuity business have lower (adjusted) yields on average than those now ring-fenced for the deferred annuity business… [1]
… and previously the valuation rate of interest used was the same for both… [1]
… then IFRS liabilities may overall reduce… [1]
… due to the longer outstanding duration of the deferred annuity business. [1]
[Note to markers: give the above for the opposite argument.]
Alternatively, the company may want to align its IFRS liabilities to those of Solvency II. [1]

If this is the case, the IFRS liabilities could change significantly. [1]

[Max 8]

[Total Max 88]

Part (i)	Most students did well in this question, those who did better recognised that the interest rate risk was due to mismatching against the risk free rate. Also those who recognised that longevity pre and post vesting were a risk for deferred annuities gained extra marks.
Part (ii)	This question part was also well answered by many students, with higher marks being gained by considering both increasing assets and reducing liabilities/capital requirements. Good marks were gained by those candidates who considered the Solvency II specific points such as the matching adjustment, and move to the internal model.
Part (iii)	Those candidates that recognised that the liabilities were reasonably predictable, due to the inability to surrender the policy, enabling close matching scored well.
Part (iv)	This differentiated those students who could think through the implications of the matching adjustment through to the standard formula. Only a few candidates gained good marks on this question.
Part (v)	Most candidates were able to score reasonably well by recognising the need to project asset and liability cash-flows. Some candidates included irrelevant material such as calibrating ESGs, which gained no marks and wasted time.
Part (vi)	Few candidates were able to identify the issues that would arise from managing the blocks of assets and liabilities that are within the Matching Adjustment arrangement and those that are not.
Part (vii)	Very few students really considered that to meet PRA requirements, there would need to be careful monitoring of the matching and rebalancing issues.
Part (viii)	Most students were able to apply TAS knowledge to this situation.
Part (ix)	Many assumed that the Solvency II yield would automatically be used in IFRS. Those who acknowledged there may be no change, but that the assets may lead to a change gained good marks.

Q2 (i) For one person to be able to take out life insurance on the life of another person, they must have an insurable interest in that person. [2]

This is a requirement under UK contract law. [1]

The interest must be a financial interest capable of valuation in monetary terms. [1]

It must be based on an obligation or liability which will arise on the death of the life assured. [1]

An individual is considered to have an unlimited insurable interest in their own life… [1]

… and in the life of their spouse. [1]

Hence the check will ensure that the "insurable interest" rule is met. [1]

[Max 4]

(ii) The requirements are set out in the Consumer Insurance (Disclosure and Representations) Act 2012. [1]

The customer must observe the utmost good faith. [1]

Customers are under a duty to take reasonable care to answer the insurer's questions accurately… [1]

… and fully [1]

and to take reasonable care not to make a misrepresentation. [1]

Misrepresentations equate to representations or omissions that are misleadingly incomplete or inaccurate. [1]

Failures by consumers to fulfil insurers' requests to confirm or amend particulars provided can equate to misrepresentations. [1]

Ultimately, it would be for a court or the Financial Ombudsman Service to determine whether reasonable care had been taken. [1]

Nevertheless, the precision with which and the range of questions that insurers have asked consumers will be taken into account when assessing whether the consumer's response was "reasonable". [1]

[Max 6]

(iii) Not treating policyholders fairly/equitably *(or not meeting their reasonable expectations)*. [1]

Making errors in the unit pricing. [2]

E.g.

Errors in the calculation of the prices at which units are allocated to or de-allocated from policyholders. [1]

Errors in the calculation of the prices at which units are created or cancelled. [1]

Errors in:

Bid/offer spread

Box management

Exchange rates

Incorrect property prices

Incorrect rectifications

(1 mark for any relevant example, maximum of 2) [2]

The way that compensation (for errors or inequities of a material size) is determined. [1]

The company does not change the pricing basis when it changes from being a net allocator to a net redeemer of units (or vice versa) [2]
If this product is classified as BLAGAB… [1]
… then there may be errors in the allowance made for tax… [2]
… on unrealised capital gains and on realised/unrealised losses. [1]
Any errors will create bad publicity [1]
And could lead to regulatory intervention. [1]
Customers selecting against the company… [2]
… if surrenders use the preceding published price. [1]
This will be particularly possible in funds invested in overseas markets in significantly different time zones where it is possible to assess overnight movements in the markets and hence know the likely direction of the unit price in the coming day. [1]
Additional risks arise if unit funds are permitted to invest in other unit funds… [1]
… in relation to potential double-charging of fees [1]
Systems may carry out of date… [1]
… or inaccurate information… [1]
… e.g. on asset values, amounts of accrued income, management charge deductions etc. *(any valid example)* [1]

[Max 10]

(iv) Any operational error could lead to reputational risk. [1]
There is a risk of mis-selling… [2]
… although this is relatively low for the new product due to the distribution channel proposed. [1]

The pricing of the products may be inappropriate. [2]
Particularly for the new product, which may not have processes/trained staff/reliable data with which to assess the charges. [2]
If expert judgement is therefore applied, this may be inadequate [1]
There may be inadequate analysis of experience. [1]

The models used may be inadequate… [1]
… or inappropriate. [1]
E.g. the pricing model for the new product may have been incorrectly specified/built [1]
There may be administrative errors. [2]
These may be either staff (or people) related… [1]
… such as the initial set up of the policy… [1]
… e.g. incorrect recording of address/bank details/ smoker status…(*any relevant example*) [1]
Or due to incorrectly setting up the IT system … [2]
… or due to IT system or process failures. [2]
Processes may fail (or be inadequate) [1]
Product terms/literature may not be worded well… [2]
… generating compliance risk [1]
Transactions may be processed incorrectly. [1]
E.g. allocation of premiums to the correct funds. [1]

Or the cancellation of units as charges. [1]
Or the payment of the guaranteed minimum death benefit. [1]

Insufficient data may be kept to allow the policy to be correctly administered … [2]
… or to permit suitable risk management. [1]
Or there may be data errors. [1]

The company's physical assets may be damaged. [2]
For example buildings or IT systems [1]
E.g. due to fire / terrorism *(any example)* [1]
Business may be disrupted for the same reasons. [1]
Service levels may be poor. [2]
Especially if levels of new business are high. [1]
This will increase complaints [1]
It could also affect levels of new business... [1]
… or retention. [1]
The staff may be incentivised in a way that does not lead to good customer service. [2]
Or there may be high staff turnover rates. [1]
The company is likely to rely on a few in-house experts… [1]
… so the company will be exposed if these employees leave. [1]
The company could be subject to fraud. [2]
Either employees within the company… [1]
… or externally. [1]
The company may fail to meet the requirements of employment law… [1]
… such as the health and safety requirements. [1]

Conduct risk [1]
Including failing to keep pace with customer needs / market conditions [2]
e.g. not offering an appropriate range of unit-linked fund choices under the new product [1]
And information asymmetries… [2]
… e.g. in relation to underwriting and the minimum death benefit on the new product [1]

Risk relating to failing to keep pace with
regulatory/legislation changes [1]
taxation changes [1]
data protection requirements [1]

[Max 30]

(v) These operational risks all still exist and counterparty risk is introduced. [2]
The outsource provider may have a proven operational risk control environment. [1]
Therefore the operational risk may be reduced by outsourcing. [1]
However, the administration-related risks are now less within the control of the insurance company. [1]
The degree of these risks to the insurance company will now depend upon:

The experience of the outsource provider. [1]
The size of the outsourcer and its available resources. [1]
The due diligence carried out by the company in selecting the outsource provider. [1]
The similarity between this product and products that the outsourcer administers for other companies [1]
The quality of the outsourced systems. [1]
The quality of the staff at the outsource provider. [1]
And how they are incentivised. [1]
The service level agreement in place… [1]
… particularly rules around whether the outsourcer is at fault… [1]
… and compensation/rectification [1]
Physical risks (and business interruption) now also include to the outsourcer's property and assets. [1]
Additional legal risk relating to disputes between the company and the outsource provider on the services to be provided. [1]
There are additional risks associated with the transfer of data. [1]
Risks are greater if the outsourcer is overseas. [1]
Due to the need to closely monitor the outsourcer. [1]
[Max 8]

(vi) **Market risk**

Risk of lower than expected investment return on unit funds [2]
So lower than expected income received by the company from the management charges [2]
And from the mortality charges [1]
Also will make it more likely that the guaranteed minimum death benefit will bite [1]
It will also impact future new business and retention. [1]

Liquidity risk

Risk of being unable to meet short-term cashflow outgo [2]
If the unit value cannot be realised by the company when unit cancellation is required to pay a customer, then the company may face liquidity issues, [1]
This will particularly relate to the cancellation of units in the direct property fund. [2]
May generate reputational risk if the benefit payment is deferred. [1]

Insurance risk

Risk of higher than expected mortality… [2]
… mainly due to the guaranteed death benefit [1]
Particularly at early durations… [2]
… where the unit fund has not yet exceeded the total premiums due [1]
The mortality charges may be insufficient to meet the mortality cost. [2]
The gender mix or smoker status mix of the customers may be different to that assumed in setting the charges. [1]
The underwriting may not be consistent with the mortality assumed in pricing. [1]
Risk of higher than expected surrenders… [2]

… resulting in the loss of future profits from charges… [1]
… and potentially receiving insufficient charges to cover initial expenses [1]
… and to cover early duration death benefit costs [1]

Risk of higher than expected expenses [2]
Development costs, initial and renewal [1]
Risk of higher than expected expense inflation [1]

New business risk
This is a very different product for the company and so its estimates of sales are likely to be incorrect. [2]
If sales are higher than expected… [1]
… then the admin teams may not be able to cope. [1]
If they are lower than expected… [1]
… then the charges collected will be insufficient and may not cover development expenses / fixed costs. [1]
If the average policy size/mix is different to that expected… [1]
… then the charges collected may not cover fixed costs. [1]

Competition risk
The products offered by competitors may be superior… [2]
… or competitors may cut their charges for competitive advantage. [1]

Counterparty risk
The outsourcer may fail to meet its obligations. [1]
Or to do so in a timely manner. [1]
It may divert resources from this product to support other clients. [1]
If reinsurance is used for the additional death benefit, there is risk that they default. [1]
There is default risk in relation to corporate bond… [1]
… and cash holdings (as for market risk). [1]
There may be non-recovery of premium balances held by the financial advisers. [1]
[Max 26]

(vii) **Market risk**
Hedge to make the income from the management charge more predictable over time. [1]
Avoid offering unit funds investing in very volatile asset types. [2]
Make the management charge variable. [1]

Liquidity risk
Maintain adequate levels of liquid assets e.g. cash. [2]
Or have a suitable overdraft facility [1]
Do not offer the property fund. [1]
Offer a property fund that does not invest in direct property. [1]
Introduce a market disruption clause that permits deferral of payment to the customer… [2]
e.g. deferral of several months. [1]

Insurance risk: general
Monitor and adapt using the Control Cycle. [1]

Insurance risk: mortality
Remove/reduce the minimum death benefit. [1]
Offer a minimum of return of premiums paid to date instead. [1]
Make sure the marketing is in line with the assumed target market so that the gender mix is as expected. [2]
Add a margin to any of the charges. [1]
Make the mortality charges variable. [2]
Use expertise in assessing the mortality risk/underwriting. [1]
Use reinsurance… [2]
… including technical assistance (e.g. underwriting). [1]

Insurance risk: surrenders
Introduce a surrender penalty [1]
Implement a retention team *(any sensible related action)* [1]
Ensure that the financial advisers are trained/motivated to encourage persistency [2]
Avoid dealing with financial advisers with poor persistency experience [2]
Allow flexibility of premiums. [1]

Insurance risk: expenses
Introduce an alternative charging structure that better matches the likely costs incurred [1]
Any suitable example (per policy fee, switching fee…) [1]
Including an initial charge [1]
Keep control of own internal expenses. [1]
Ensure that the expense agreement with the outsourcer is robust [1]
Match expenses with index-linked assets. [1]

New business and competition risks
Assess the product structure in relation to the market. [2]
Perform market research on likely volumes. [1]
Monitor customer satisfaction with the product… [2]
… and service. [1]
Monitor actions of main competition. [1]
If competitors change their products, consider whether comparable changes can be made... [1]
… or whether it would be more advantageous to withdraw from the market.[1]
Introduce minimum premium size. [2]

Counterparty risk
Only deal with counterparties that have strong proven track record. [2]
Only deal with counterparties that have a high credit rating. [1]
Identify key metrics for the counterparty that would be good lead indicators of potential difficulties. [1]
Rigorously monitor these metrics. [1]
Ensure the agreements have clear redress actions. [1]

Where possible, do not rely on one counterparty… [2]
… although this may not be possible for the administration outsource partner. [1]
Impose collateral/deposit back arrangements. [1]

[Max 28]
[Total Max 112]

Part (i) and part (ii)	These two parts were answered well by those familiar with the relevant Core Reading
Part (iii)	This was reasonably well answered by the majority of candidates. A few candidates appeared to mis-read the question as discussing pricing risks rather than unit-pricing specifically.
Part (iv)	Well prepared students covered all the areas (including, for example, conduct risk and employment law) and went on to elaborate on these. However some concentrated only on the administration and transaction risks.
Part (v)	Higher scores were achieved by those candidates that considered what might impact the risk introduced by outsourcing.
Part (vi)	Well prepared students worked through the main risk areas and applied the information provided in the question to elaborate on the specific risks.
Part (vii)	Again, well prepared candidates went through the risks identified in the previous question part and put forward actions that would mitigate those risks.

END OF EXAMINERS' REPORT