

INSTITUTE AND FACULTY OF ACTUARIES

EXAMINERS' REPORT

April 2015 examinations

Subject SA1 – Health and Care 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 at the date the examination was set. Candidates should take into account the possibility that circumstances may have changed if using these reports for revision.

F Layton
Chairman of the Board of Examiners

July 2015

General comments on Subject SA1

Candidates who approach the questions, especially the more substantial elements of each question, in a methodical and detailed manner are far more likely to pass the subject. Candidates will gain few marks if they do not address the question asked but merely write around the topic of the question. The mark allocation for each question part gives an indication of the relative length of answer or number of points to be made to gain full marks.

It is often helpful to use subheadings when answering long part questions.

Comments on the April 2015 paper

Overall the paper was relatively straightforward and well-prepared candidates scored well across most of the whole paper. As in previous diets, questions that required an element of analysis or application of knowledge were less well answered than those that just involved repeating bookwork. 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 concentrate their revision in these areas.

1 (i) Company structure

An introduction of the company's history

An overview of the group structure

An overview of the health insurance subsidiary's company structure

Location of main office and location of the subsidiary

Organisational structure including the descriptions of main functions such as:

 risk and compliance

 finance

 investments

 products and marketing

 operations and admin

An overview of the senior management team

An overview of the company's risk, governance and management committees

An overview of the company's risk management framework and compliance systems

Memorandum and Articles of Association

Details of auditors

Operating markets

A description of the health market in which the subsidiary operates

The future growth opportunities of the health insurance market

The company's operating strategy in the health insurance market

Target markets

The competitiveness of the market and the key competitors

The company's market share

Historic trends/changes in market share

TCF policies

Reason for the sale

Products

A description of the company's main health insurance product offering split by individual and group business

Key characteristics and features of the individual products, e.g.:

 replacement ratio

 deferred period

 premium reviewability

 occupational claim definition

 expiry age or term

 escalation of benefits/premiums

 guarantees/options

Key characteristics and features of the group products, e.g.:

 free cover limit

 premium rating approach

 profit sharing arrangements

 continuation options

Information relating to the volume of in-force business

Information relating to the volume of new business

Both sets of the above volume information should be split by main product type, and should be by:

- Total premium (or annual premium equivalent)
- Total benefit amount
- Number of policies
- Geographical distribution
- Industrial / occupational distribution
- Sales channel

Company's underwriting strategy and policy

Underwriting statistics e.g. proportions declined/rated/standard

Specific information on the size of group schemes/special group features

The results from any customer satisfaction surveys

The company's compliance process

Sales and marketing

The main distribution channels for the products

Specifically for the group business, information relating to the main brokers used

Commission and sales remuneration structure

The company's image and reputation in the market

Operations

A list of owned buildings, main offices and infrastructure

Details of any lease/rental agreements

Details of new business processing and administration processes and of the in-force customer servicing and policy administration processes

An overview of the company's information technology infrastructure and communication systems

An overview of the claims management policy and claims handling processes

Details of investment strategy and investment management operations

Details of reinsurance strategy and an overview of reinsurance arrangements currently in place

Details of outsourced services and arrangements and overviews of any service level agreements

Details of staff numbers and staff employment terms

Key current projects

Information on debtors/creditors

An overview of key risks/risk register

Information on the company's pension scheme

Historical and current financial information

Financial accounts including:

- income statement / operating profits
- balance sheet
- dividends paid

Internal management accounts if these differ from those published

The size of the company in terms of assets under management
Asset profile / overview of main classes of investment and information on asset/liability matching approach
The solvency (or surplus assets) position on the regulatory Pillar 1 basis
Details of reserving methodologies and assumptions
A breakdown of reserves/capital e.g, mathematical reserves, UPR, IBNR, etc
The capital position on Pillar 2 (ICA) basis
The estimated capital position under Solvency II
The embedded value and embedded value profits
The assumptions used to determine the EV
New business metrics such as new business value, new business strain, internal rate of return or return on capital
An analysis of supervisory surplus
An analysis of change in embedded value
An analysis of claims experience e.g. inception/recovery
An expense analysis including a breakdown of the company's expenses e.g. initial, renewal, termination, wages, rent, IT
An analysis and breakdown of the persistency experience
Any tax considerations
The company's liquidity position
Ideally, provision of all of the above for the last five years
The appraisal value/goodwill amount/sales price sought

Financial projections

A forecast of future new business based on company's new business strategy
The financials could include value of new business (or IRR) and future operating profits
An overview of the core drivers behind the new business assumptions and financials
The current business plan

Similar to historical information, the projections would include:

Solvency ratios
Capital position
Liquidity position
Operating profits
Embedded value and embedded value profits

(ii) Issue:

Many insurance contracts are designed so that future margins exist which, when they arise in the future, are not actually required to meet renewal costs then being incurred by the insurer. Instead, the margins are used to recover the new business costs incurred when the contract was issued. When contracts are issued, the impact of new business strain/high initial expenses would reduce profits at that point. This profit depression may then be followed by more profitable future years.

In MSB accounting there is a desire to stabilise financial progress and remove/reduce the volatile effect of new business strain.

How DAC addresses the issue:

DAC refers to the process, in accounting terms, of deferring the acquisition costs incurred so that they are not allowed to depress profits at issue of the insurance contract.

A DAC asset is set up at the outset of the policy equal to the deferrable proportion of/part of the acquisition costs. This has the effect of increasing profits at outset. Subsequent profits are then reduced by writing down the DAC asset over the amortisation period. This write-down is against the margins arising in the future, where these margins are not needed to cover ongoing renewal costs of the insurer. The amortisation of the deferred acquisition costs should be over the period in which they are expected to be recoverable out of margins in matching revenues at a rate that is commensurate with the pattern of such margins.

- (iii) The costs in question have already been recovered.

The contracts are not expected to generate enough margins over their lifetime to cover the acquisition costs after meeting other costs.

The receipt of future premiums or future margins is insufficiently certain based on prudent estimates of future expected discontinuance rates or other experience.

- (iv) The main reason is that individual business is likely to be written as regular premium contracts with a relatively long policy term. Group business on the other hand is more akin to a single premium short term contract, typically annually renewable. Acquisition costs for group business are therefore mostly recouped as soon as the policy is written. Furthermore, the receipt of future premiums and margins is more uncertain for group business (relates to the third constraint mentioned in part (iii)). Any acquisition costs that are deferred for group business would be deferred over only a short period and so are quickly written down.

If the portfolio is dominated by in-force rather than new business, the DAC asset would largely comprise amortised DAC carried forward from earlier time periods – and these are more likely to be on individual business.

Acquisition expenses on the individual business could be much higher than those on the group business. The company could be paying much higher commission on its individual business. Underwriting costs could be much higher, as underwriting is typically more complex for individual business. The company may incur more costs marketing its individual business.

The size of the company's individual business could be much larger than its group business.

- (v) When a policy is first written, the embedded value (EV) will increase by the present value of all future profits expected to arise on it less the new business strain. Therefore the present value of all future margins are taken into account (and offset against initial strain) at the time when the policy is written. For the in-force portfolio, under the EV basis credit has therefore already been taken in past years for all future margins; therefore the future projected profits under the EV basis would not include the release of such margins.

Under MSB, DAC is likely to be set up for the individual IP business and this will be amortised over time by offsetting against emerging margins from future regular premiums, which serves to reduce the amount of future emerging MSB profits. However, the emerging margins are only being reduced by the extent to which it is permitted under the MSB regulations (DAC is limited to size of initial expenses, so credit cannot be taken for all VIF as this should include a profit loading as well as recovery of initial expenses).

The amortisation pattern chosen for the write-down of the DAC may have been done on a prudent basis in order to avoid breaching these constraints. So there may still be expected margins to emerge under the MSB basis (if no DAC asset is used, later profits will be higher). Differences may also arise in the pace of profit emergence due to the level of prudence in the assumptions used. If the MSB reserves are calculated on a prudent set of assumptions this will defer the emergence of profit and hence result in higher profits later on whereas under the EV basis, the release of all prudential margins in reserves are taken credit for immediately when the business is written if the experience projection basis is realistic and so do not emerge in the future projected profits.

The profit over the contract term is the same under both approaches (so if EV has more profit early on, it must have less profit to emerge in future).

Part (i) was generally well answered with candidates providing a wide range of relevant points, although relatively few candidates included information on the company structure, operating markets, business plan or various capital or financial projections. Candidates could also have included greater detail on the products sold by the insurance subsidiary and not all candidates included points that were specifically relevant to group IP.

Part (ii) was generally well answered with most candidates showing a good understanding of a DAC asset, although few made the point that the DAC would be met from future margins that were not needed to meet future renewal costs.

Part (iii) was bookwork but was less well answered. Many candidates did not discuss the point relating to the uncertainty of receipt of future premiums or margins.

In part (iv), whilst most candidates made relevant points related to the higher acquisition costs of individual IP, fewer candidates recognised that group IP is short term business and hence would have very little DAC, which is recovered quickly.

Part (v) was generally poorly answered, with few candidates appearing to appreciate that, under EV, for new business the present value of all future margins are taken into account at the time when the business is written.

- 2 (i) The data interface with the cedants/transfer of data
Accuracy/quality of the data provided by the cedants and its completeness in terms of having all of the required data fields populated and in terms of including all of the relevant policies and credibility
Ensure there is a robust link between claims and exposure data
Timeliness of the provision of data from cedants/data out of date
The frequency of data being made available to the reinsurer
Data granularity
Data structure
Compatibility between the format of data provided by cedant and what is required by reinsurer
Data cleansing and adjustment process
Have effective auto-checking routines
Have sufficiently skilled staff to deal with the data
Keeping pace with technological advances
Data consistency between cedants
Data consistency over time
Capacity of the reinsurer's existing data systems
Data error as a result of internal systems/process issues
Incomplete data as a result of internal systems/process issues
Data access arrangements
Safe storage of confidential data
Safe disposal of data
Data sharing with third parties
Data Protection Act requirements (if applicable)
Linkage of data between functions e.g. between actuarial and underwriting, claims management
Data processing capabilities
Data related costs
Data relating to any retrocessions
- (ii) There could be reserving benefits. The better the quality of the data, the fewer estimates and approximations have to be made and the more certainty there is in the reserving calculations. Lower reserves can be held if there is good quality data on which to base the calculations because a lower prudential margin can be incorporated into the valuation basis and any explicit data error provisions could be reduced or released. This would allow more efficient use

of capital which could be better used elsewhere to generate increased returns (e.g. new product support).

Solvency will be improved.

Being able to hold lower reserves would accelerate the emergence of profit and hence accelerate dividends payable to the shareholders and/or reduce premiums. The risk of under-reserving is also reduced which could cause solvency issues when rectified, if material.

The lower level of volatility in reserves could provide more confidence to the shareholders and potential investors. This could lead to a more stable share price and minimise the potential risk of providing a distorted financial picture from the true performance of the underlying business.

The regulators will be happier as will credit rating agencies. There is also less likelihood of being fined by the regulator.

There could be pricing benefits particularly relative to competitors and the ability to differentiate from them. Having more and better quality data would assist the pricing function to refine their price to the cedants. This could lead to winning more new business through better use of internal data to set appropriate pricing assumptions. This may also help in retaining more existing business through a better understanding of the individual treaty/cedant's performance. It may therefore increase profits. Good data management also reduces the risk of setting prices too low and hence losing out on potential profits.

Good data management could provide a better understanding of experience, particularly in relation to trends. This could help the reinsurer to take proactive remedial action e.g. by closing a treaty to new business to stop the flow of poor performing business, whether, for an in-force block that is reviewable, the premiums should be increased at the in-force rate review or for setting an appropriate profit share or reinsurance commission payment.

The availability of good quality data would enhance the results of an analysis of surplus. This could mean improved ability to carry out business forecasting, leading to higher confidence in business decisions.

There could be benefits relating to the cedant/client relationship. Being able to validate data quickly could provide client relationship benefits because the reinsurer could provide timely feedback/concerns to the cedants, assisting them to identify and rectify any potential problems. Timely feedback could also provide the impression to the cedants and potential clients that the reinsurer is on top of its process and hence provide a reputational benefit, particularly in respect of the quality of technical assistance provided. This could increase new business sales.

Avoiding delays in receipt of data from cedants will reduce delays in inputs getting to the actuarial models and hence avoid delays in the overall reporting process and the production of management information. It should also make the management of reserving resources easier.

Better data management should mean that fewer manual adjustments are needed before the data is suitable to be used. This reduces the scope for additional errors and speeds up the reporting process. It also reduces reliance on expert judgement, which may be required in the data adjustment process but which may be costly to obtain.

There could be benefits relating to internal efficiency within the reinsurer if complete and accurate data can be stored once and are readily accessible by all in the different function areas. Sourcing the data from the same system could also help minimise the risk of different interpretations being taken by different function areas.

Having good data linkage and access may avoid duplications in the process.

If the existing systems are well designed to handle the large volumes of data, this would avoid incurring high costs of external processing and data storage.

Having good data may reduce liquidity risk.

Strong data confidentiality management should reduce the risk of legal action being taken against the reinsurer with correspondingly lower legal costs and it should similarly reduce the risk of receiving adverse media publicity.

Good data management should lead to cheaper retrocessions.

- (iii) Policy number
 - Individual/group
 - Joint life/single life
 - Product type/code/name
 - Data date
 - Benefit type/escalation
 - Policy type /deferred period etc
 - Mortgage interest rate for decreasing term product
 - Distribution channel
 - Premium frequency
 - Premium type (guaranteed/reviewable)
 - Premium amount
 - Reinsurance premium frequency
 - Reinsurance premium type (guaranteed/reviewable)
 - Reinsurance premium amount
 - Postcode/location
 - Name of insured live(s)
 - Date of birth

Gender
Smoker status
Occupational class
Underwritten status
Reinsurance percentage
Policy application date
Policy risk commencement date
Policy expiry date
Policy movement code
Policy status
Date of status change
Currency
Original sum insured
Original sum reinsured
Original sum retained
Current sum insured
Current sum reinsured
Current sum retained
Claim amount
 claim cause
 claim date
 claim duration
Reinsurance indicator
Reinsurance claim

- (iv) As the request is made by the ceding company, the underlying principle for the reinsurer is to ensure that it will be compensated for forsaking future profits. The starting point for the calculation would therefore be the value of in-force (VIF) business covered by the treaty concerned, i.e. the present value of expected future profits from the treaty.
- (v) The policy data would be based on the most recent data provided by the ceding company for the latest valuation. This may need to be adjusted for new business and decrements between the extract date and current valuation date. In practice, as this is a one-off exercise, the reinsurer may request the ceding company to supply the latest data. This could be beneficial for both parties as there will be less need for subjective adjustments to be made to the policy data.

The calculation will most likely be done on a policy by policy basis although model points could be used for sufficiently homogenous and large data groups.

It may be necessary to model future new business to the extent that this is included in the treaty. If so, expected new business model points will need to be set e.g. based on recent experience under this treaty and new business volume assumptions.

Retrospective adjustments may be made to reflect actual new business volume.

Future cash flows will be projected forward using realistic assumptions and discounted back using an appropriate risk discount rate. The key cash flows to be projected will be reinsurance premiums received less reinsurance claims paid less expenses incurred plus investment earnings plus release of reinsurance reserves.

The assumptions will need to allow for expectations of future trends and be based on the most recent experience investigations.

The risk discount rate will be based on the current risk-free rate. The discount rate or overall price may be adjusted to include a risk margin and the profit margin.

The risk and profit margins should be based on those used by the reinsurer when the treaty concerned was originally priced.

Morbidity assumptions will be largely based on the treaty's own experience, subject to credibility considerations. If credibility is a potential issue, the treaty's own experience could be supplemented by the experience of other similar treaties covering long-term guaranteed regular premium critical illness business using an appropriate credibility factor and appropriate adjustments. There will be similar considerations in respect of mortality although for standalone business it is more likely to use wider experience.

Allowance for commission should be based on the terms set out in the treaty.

Expenses should be based on the treaty's share of the reinsurer's overall expenses, taking into account expense inflation. For a large treaty that makes up a relatively significant proportion of the reinsurer's overall business portfolio allowance may be needed in the expense assumptions for any potential reduction in economies of scale.

Persistency will be based on the most recent experience, particularly in respect of this cedant.

The investment return assumption will be consistent with the risk discount rate and expense inflation assumption and take into account the reinsurer's current investment strategy.

The reinsurer's own methodology and assumptions for statutory reserving would be used.

The cost of capital needs to be factored in using the reinsurer's existing solvency requirements relating to the treaty concerned.

Suitable allowance for any existing deposit back, profit share or collateral arrangements between the ceding company and the reinsurer needs to be made.

If there are retrocession arrangements in place, allowance should be made for the potential costs and recoveries of any retrocession arrangements.

The reinsurer may want to factor in explicit allowance for the costs associated with the termination of any retrocession arrangements.

Tax will be based on the current tax position of the reinsurer.

Sensitivity tests may be performed before determining the final value.

(vi) It may be due to commercial factors.

The reinsurer may reduce the value if the ceding company concerned is a very important client (or if it has a lot of other business with the reinsurer).

The theoretical value could be negative, i.e. the treaty could be loss making in the future in which case the reinsurer may not even request a recapture value from the ceding company. This may be the case if the treaty concerned is closed to new business and has been in force for a long time where claim costs are expected to exceed guaranteed level premium in the near future.

There may be existing clauses in the treaty which state a different approach or an adjustment to the proposed approach.

An approximation may be used to save time and cost, particularly if the value is low.

The reinsurer may choose to correct for any mispricing.

The reinsurer may increase the theoretical amount by a penalty factor to deter future terminations and similarly to compensate it for the additional costs involved in processing the termination.

Part (i) was generally well answered, although few candidates mentioned aspects related to costs or having skilled staff available.

Part (ii) was less well answered. Many candidates made few, if any, of the points relating to internal efficiency, data storage, cost savings, reporting or reducing the possibility of legal action or other reputational issues arising.

Part (iii) was generally well answered, although a number of candidates listed experience analysis information, such as claim rates, rather than recognising that the insurer would provide policy data from which the reinsurer could calculate all relevant rates.

Part (iv) was well answered.

Part (v) was not so well answered, mainly through candidates not providing enough points to earn good marks given the high mark allocation. Few candidates discussed the policy data to be used, allowing for the cost of capital or any deposit back or profit share arrangements or retrocessions, or the possibility of allowing for the costs of termination.

Candidates also generally made good attempts at part (vi), although there was a tendency to focus on reasons for charging a lower amount than the recapture value with few candidates also mentioning reasons why a higher amount might be charged.

3 (i) The experience difference by birth month is not significant.

It is vastly outweighed by the differences that correspond to the existing rating factors used.

It would not have a significant impact on premiums.

It is a proxy (alternative) to other rating factors already used.

It is not expected to have a significant impact on business volumes e.g. materiality.

Management may not believe the results of the analysis or the volume of data on which the analysis was based was not credible.

It may have been a temporary phenomenon that is not expected to continue in future.

The company wants to see some more experience coming through before considering implementing this change.

The company cannot justify the investment based on the return/profit it will generate i.e. costs incurred due to changes to admin systems and changes to process (pricing, underwriting) and additional queries that people have as a result of this (or the need to do additional training of customer services).

The company has other priorities/preferred uses of capital or not enough resources/capital to implement this.

It may be difficult to explain / justify this differentiation to policyholders. Customers or distributors may see this as a marketing stunt which could discredit the company (reputational damage).

The company may be of the view that using this as a rating factor may be outlawed by the regulator in the future.

Other competitors in the market have said they are not going to make the change/ wait to see what other competitors do.

The company took advice from a reinsurer, which recommended not to include it.

(ii) Reputational risk:

There is a risk of reputational damage e.g. the company may be seen as lagging behind a major competitor or because some policyholders may feel that they have not been treated fairly (if they were born in a month with low claims experience).

Claims experience and anti-selection risks:

If ABC does not change its own premiums, then on average ABC's premium may be more expensive than those of the competitor for people born in the lower risk months, and cheaper for higher risk months. It is therefore more likely to attract more people born in the higher risk months and fewer in the lower risk months. This is a type of anti-selection. The situation may be exacerbated by the actions of distributors. Claims experience is therefore likely to deteriorate, leading to lower profits or the need to increase premium rates for all lives which will exacerbate the anti-selection issue.

There may be an impact on the availability or cost of reinsurance.

Data risk

It may be harder to price the changed experience.

New business and persistency risks:

As there is effectively some cross-subsidy between premium rates if month of birth is not allowed for, there is new business mix risk (as described above).

Depending on how the competitor sets (and markets) the new premium rates, new business volumes may reduce overall.

Lapses may increase and this may be selective i.e. more likely that those born in the lower risk months would lapse.

There is a risk of not being able to cover cost overheads due to lower new business and in-force volumes.

The extent of the risk to the company will also depend on how many other competitors implement this change.

- (iii)** Increase premiums to reflect the potential higher claim costs due to anti-selection (i.e. the risk cost of higher risk birth months).
Monitor experience and reprice regularly.
Monitor competitors' premiums.
Increase reserves if allowed to.
Reduce premiums in order to prevent loss of business (or sell as a loss leader).

Reduce expenses e.g. through cost efficiencies / outsourcing or reduce claim cost e.g. renegotiate provider arrangements to enable offering the same cover at lower cost to all customers.

Offer discounts when bought together with other policies (e.g. CI or IP).

Ensure that customer service is better than that of the main competitors.

Improve claims processing efficiency and simplicity.

Improve new business processing efficiency and simplicity.

Improve underwriting efficiency and simplicity.

Increase overall marketing specifically to the desired target market (i.e. lower cost birth months).

Improve brand awareness e.g. through sponsorship.

Give away incentives or “freebies”.

Improve the overall product offering and appeal e.g. the range of conditions and treatments covered, limits and excesses, helpline services, deals with hospitals that are desirable to policyholders.

Set up a customer retention team.

Introduce no claims discount.

Create a cheaper and simpler product.

Ensure that the company has good relationships with distributors and pays them a competitive remuneration. Alternatively may consider changing the distribution channel.

Use other rating factors which may be better drivers / indicators of expected claim experience.

A reinsurer may be used to access technical assistance on pricing.

The company might switch to selling more group PMI or stop selling the product completely.

All of the parts of this question were well answered by well-prepared candidates.

END OF EXAMINERS' REPORT