INSTITUTE AND FACULTY OF ACTUARIES

EXAMINER'S REPORT

April 2015 examinations

Subject SA4 – Pensions and other Benefits 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 SA4

This subject examines the ability of candidates to apply actuarial practice and concepts, together with specific knowledge of the UK pensions and employee benefit environment to potentially complex problems, integrating their analysis into a coherent whole, and evaluating and interpreting results to draw explicit conclusions.

The examiners therefore look for candidates to demonstrate their understanding of the syllabus but in particular they need to demonstrate ability in applying their knowledge and core actuarial skills to the specific situations that the examiners have raised, having read the question carefully. Consistently, many of the unsuccessful candidates provide answers that are not sufficiently specific to the subject matter of the question, reproduce core reading that does not directly relate to the question context, or focus on one specific point without covering the a sufficient range of points to answer the question. This does not enable the candidates to achieve the required marks. As regularly stated, the examiners encourage future candidates to remind themselves of what they learned in the Core Actuarial subjects, and to use past paper questions to practice applying these skills to the specific scenarios tested.

Good candidates demonstrate that they have structured their solutions well – this is a big advantage in making points clearly and without repetition. There is a significant incidence of points being repeated in slightly different ways, restricting the scope for candidates to score marks. Good structure enables candidates to use the latter parts of questions to generate ideas for answers to the early parts (or use their solutions to earlier parts of questions to create a structure for latter parts). Time management is important so that candidates give answers to all questions that are roughly proportionate to the number of marks available. The questions are set so that it should take approximately twice as long to answer a 10 mark question as a 5 mark one. Answers should therefore be similarly proportionate.

In addition, candidates should carefully consider the instruction – for example an instruction to list points should be answered with a list without attaching discussion. Similarly, a question asking for a discussion cannot be answered with a list of undeveloped points.

Finally, it is very helpful for the examiners to clearly identify scoring points in scripts if they are set out clearly, well-spaced and easily legible. Whilst there is no loss of marks for not doing so, doing so does make it easier to identify scoring opportunities.

Comments on the April 2015 paper

The overall standard of scripts was similar to the previous session, with candidates over recent years maintaining a very consistent level of performance. There was, however, a slightly higher pass rate than at the previous session. The step up from the earlier subjects to a smaller number of more involved questions is relatively difficult for some candidates who find the application aspects of the course harder to score well on. This is an area that SA candidates consistently need to work harder on in preparation. By taking a methodical approach to answers, step by step, however, there are opportunities to score well.

It is important that candidates make sure they provide a full answer to all questions. Breaking the question down into smaller parts helps to make sure that a suitable breadth of answer is supplied. It is critical that candidates check that their answers specifically refer to the details of the question, using all of the information in the question pre-ambles. It is not the intention of the examiners to include information in the questions that is not relevant to the answers. Taking care in these points of technique will help students score better.

1 (i)

- Market value of equities is volatile
- this may lead to a volatile funding level and pressure for higher deficit contribution requirements
- which require further support from the employer
- Equity prices may fall
- Even over long periods of time
- Meaning that equities need to be sold at depressed prices to pay benefits
- This may be a particular issue here as the scheme is relatively mature and so may have negative cashflow
- Income from equities is not guaranteed
- Overseas equities may present currency risk
- And be exposed to political risk
- Some equities may suffer from lack of liquidity
- Or high dealing costs
- Equities carry default risk
- Equities will not match liability movements caused by changing interest rates or inflation expectations
- The corporate bonds may not be a good match for the scheme liabilities by duration
- And will not match inflation linked liabilities or salary-linked benefits
- Corporate bonds carry credit risk
- And may suffer from lack of liquidity
- No protection against longevity risk
- There may be a lack of diversification which could be improved by holding other assets e.g. property, gilts

Generally well answered. Candidates need to make sure they make the obvious scoring points – ie don't miss the basics.

(ii) *Preparation*

- The trustees are responsible for specifying overall guidelines for investment strategy after consultation with the sponsoring employer.
- They must set out these guidelines in the SIP.

The Statement of Investment Principles normally includes:

- the minimum and maximum holdings permitted in different asset classes
- the kinds of investments held
- the balance between different types of investments
- the risks relating to the current investment policy
- and the expected returns
- the policy for meeting the Statutory Funding Objective
- the realisation of assets
- the maximum investment in any one company
- the maximum investment in illiquid assets
- the use of futures and options
- self investment
- the extent of any exposure to foreign currency

- the trustees' policies on corporate governance and socially responsible investment

Review

- The trustees must review their SIP at least every three years and without delay after any
- significant change in investment policy.

Such a review must consider:

- the liability structure of the scheme and any changes made since the last review
- the scheme's funding position
- the investment manager's past performance

Again well answered – relatively straightforward bookwork.

(iii)

- The discount rate would need to be amended to reflect the expected rate of return from the new investment strategy
- Starting point is the yield available from gilts (3.2% per annum)
- Adjusted to take account of any difference between the duration of the index and the scheme liabilities…
- …reinvestment risk…
- …investment management expenses…
- …and any additional margin for prudence
- Assume that investment return pre and post retirement is reduced to 3% per annum
- (bonus for taking a margin off the gilt yield and explaining why)
- Assume average term to retirement of active members is 15 years
- Assume average term to retirement of deferred pensioners is 12 years
- Assume Average duration of pensioner liabilities at retirement is 15 years
- Assume average duration of current pensioner liabilities is 12 years
- Assume no changes to inflation and other assumptions
- Ignore any transitional costs in changing the investment policy
- Switching the liability figures:
- Active liability = £20m * $(1.05/1.03)^{15}$ * $(1.035/1.03)^{15}$ = £28.7m
  Deferred liability = £80m * $(1.05/1.03)^{12}$ * $(1.035/1.03)^{15}$ = £108.4m
  Pensioner liability = £50m * $(1.035/1.03)^{12}$ = £53.0m
- Assume expense allowance unchanged at £6m
- Total liability = £28.7m + £108.4m + £53.0m + £6m = £196.1m
- Deficit = £196.1m – £140m = £56.1m
- Assume deficit still spread over 10 years
- abar(10)@3% = 8.658
- Annual deficit contribution = £56.1m / 8.658 = £6.5m per annum

Other valid approaches were given credit.

Candidates need to demonstrate a good understanding of how different aspects of the liabilities fit together. This section tended to be either very well or very poorly answered and was an opportunity to demonstrate understanding not just knowledge.

(iv) *Advantages*

- This will result in better security of benefits
- Due to a lower risk investment strategy
- Risk of scheme assets losing value due to stock market falls is removed
- Risk of investment income being reduced due to dividend cuts is removed
- Currency risk of holding overseas equities is removed
- Gilts are low risk as income and capital payments are guaranteed by the government
- Gilts could be a better match for some or all of the scheme's liabilities
- Particularly if index-linked gilts are held to broadly match pension and salary increases Funding level and deficit reducing contributions should be more stable
- Risk based PPF levy will be lower
- Gilts are marketable assets with regular coupon payments and therefore can be used to meet cash requirements without the need to sell them at inopportune times
- Particularly useful here as the scheme is likely to have negative cashflow
- Such an investment policy may make buying out the liabilities more cost effective should this become necessary/desirable
- as such assets will be more closely matched to the buy-out terms
- and the insurer is more likely to accept these assets as part of the deal.

Disadvantages

- Gilts may not be a good match for the scheme's liabilities
- If they are the wrong duration
- Or are not inflation-linked
- Gilts have a lower expected return than equities and corporate bonds
- Hence the discount rate used to value the liabilities will be lower
- And the reported value of the liabilities will be higher
- Requiring a higher rate of deficit reducing contributions
- Which the employer may not be able to afford
- This may result in the closure of the scheme to future accrual and/or
- insolvency and benefits being reduced through the PPF
- There is little chance that better than expected investment returns will reduce the now larger deficit
- There may be advice costs incurred in switching investment strategy
- And transaction costs
- The risk due to lack of diversification is increased
- The likelihood of the provision of discretionary benefits and/or beneficial option terms is reduced

The better answers clearly split out even share of advantages and disadvantages, often using one to generate the other.

(v) *Investigations*

- First step is to obtain further information to confirm the trustees' concerns about the employer covenant
- An external employer covenant review by experts is likely to be the most appropriate course of action
- Need to consider the impact of the change in the employer covenant on the employer's balance sheet…
- …and its cashflow…
- …i.e. its ability to pay the £2.5m annual contribution and the extent to which this can vary
- Discuss the situation with the employer to understand the reasoning behind the poor trading results
- Including consideration of whether the impact is in respect of the employer only or affects the whole industry or economy
- And if the performance is temporary or likely to be permanent
- Consider any impact on the credit rating of the employer or any issued stock
- Has the PPF levy changed as a result of the failure score increasing?

Actions

- Actuarial and legal advice will be sought on these various courses of action
- Changing the scheme's investment strategy to bonds
- investing in assets that pay out in the event of sponsor default, such as derivatives including credit default swaps
- considering alternatives to cash payments if the sponsor is unable to afford them, such as a charge on the sponsor's fixed assets
- including ratchets in contributions so that if the sponsor's financial position improves then the scheme shares in this improvement
- set up contingent contributions so the sponsor has to make up the deficit more quickly if the scheme's financial position deteriorates.
- Discuss with the employer changes to future benefits, such as
- Increasing the member contribution rate
- Reducing the value of future benefits
- or closing the Scheme to future benefit accrual
- If the Trustees believe that the employer will not be able to fund the scheme benefits they should consider triggering a wind-up of the scheme…
- …if they have this power under the Scheme rules
- Request a funding update based on more prudent assumptions (due to the weakening of the covenant) which will result in higher contribution requirements
- Reviewing any discretionary benefits or augmentations
- Reviewing the option terms and consent requirements

Again, splitting out the instructions helps format answers. For many, however, there was insufficient breadth of answer.

(vi)

- Viable means that the deficit can be eliminated in acceptable timeframe
- If the Trustees invest in gilts then a 10 year recovery plan (£6.5m per annum) will not be viable
- Considering other length recovery plans:
- Abar (30) @3% = 19.9 requires contributions of £56.1m / 19.9 = £2.8m per annum
- Abar (40) @3% = 23.5 requires contributions of £56.1m / 23.5 = £2.4m per annum
- Cost of benefit accrual will be slightly greater than £0.5m per annum under gilt-based assumptions
- Hence, if scheme continues in its current form then the maximum affordable contributions of £3m per annum will barely cover a 40 year recovery plan plus the cost of future benefit accrual
- Although there is no theoretical limit on the length of a recovery plan
- This would leave no margin for error
- Such as scheme experience worse than anticipated
- Or employer covenant deteriorating further
- This suggests that it is no longer viable for the employer to continue to operate the scheme as it has been doing
- If the trustees continue to invest in equities then the initial contribution rate based on the current funding assumptions is £2.5m per annum
- This is within the £3m affordable limit
- And there would be scope to lengthen the recovery plan in the event of adverse experience
- So at first glance, it appears viable for the employer to continue to operate the scheme
- However, given the weaker employer covenant, the Trustees should consider whether the current funding assumptions remain appropriate
- Or whether the equity risk premium should be lowered
- And / or other funding assumptions strengthened
- This would result in a longer recovery plan or a recovery plan with less margin for error
- However the scheme's assets and liabilities are highly mismatched
- An adverse change in equity or bond prices could easily push the employer contribution rate beyond the £3m affordable limit
- This suggests that it is no longer viable for the employer to continue to operate the scheme as it has been doing
- The Trustees might look to secure alternative security from the Company

Other valid approaches were given credit

This was less well answered – this question requires candidates to consider how the knowledge they have can be applied to the specific question as described.

(vii) (a) *Setting CETVs – principles*

- The assumptions used to calculate cash equivalent transfer values are set by the trustees
- After taking advice from the scheme actuary
- As a minimum, the cash equivalent transfer value should represent the actuarial value of the deferred pension the member is entitled to
- Calculated using "best estimate" assumptions of the cost to the Scheme of providing the deferred pension
- I.e. with no margin for prudence
- Trustees will not be expected to assume that all members will definitely select the most favourable option, but can allow for the likelihood that the member will take up the option.
- For these purposes an option needs to be considered only if it does not require consent by the trustees and/or the employer to be taken.
- Starting point may be the scheme funding assumption or the neutral SFO basis
- Reflecting the new investment strategy
- Adjusted for prudence and options as discussed above
- Assumptions are often market related
- I.e. based on market interest rates at date of calculation rather than at triennial valuation date
- Transfer values may include an allowance for discretionary post retirement pension increases depending on their likelihood.
- Allowance may be made for the cost of calculating the transfer value. Expenses are also saved if a transfer value is paid out. A common approach is to ignore both aspects of expenses in the calculation.

(b) *Suggested values*

- **Investment return 3.2% (best estimate return on gilts – margin removed from valuation assumption)**
- **Pension increases pre retirement 2.9% (retail price inflation assumption without margin for prudence)**
- i.e. no salary growth assumption as active members assumed to leave pensionable service
- **Pension increases post retirement 2.9% (retail price inflation assumption without margin for prudence)**
- **Mortality assumption – same base table as funding assumptions or neutral basis, slightly weaker mortality improvements**
- The commutation allowance is nil assuming this option is not favourable.
- Ignore discretionary pension increases as no history of provision.
- Expenses are ignored on the basis that the costs and savings broadly cancel out.

This was relatively well answered.

(viii)

- The scheme is underfunded on the transfer value basis
- Therefore paying transfer values in full would reduce the level of funding for other members' benefits
- The trustees should consider whether to reduce transfer values on account of the underfunding
- As permitted by legislation via an insufficiency report
- Details of the Scheme's funding level on a CETV basis
- Size of the FD's CETV relative to the size of the Scheme
- Trustees need to consider the best interests both of the transferring member
- And the remaining members
- The strength of the employer covenant is a key consideration
- Conversely, given that the covenant is weak then it may be more appropriate to reduce transfer values
- The reduction applied can be a simple percentage based on the funding level of the Scheme
- Or a more complicated calculation based on the wind-up priority order
- In this instance, the member has a relatively small proportion of his benefits in the higher priority category (benefits protected by PPF compensation)
- And a large proportion in the lower priority category (benefits in excess of PPF compensation)
- Because of the PPF compensation cap and the fact that he is below normal retirement age
- Given the weak covenant, this suggests a reduction based on priority order would be more appropriate
- In order to best protect the funding level of other benefits
- Particularly if there are other members with sizeable pensions who may want to transfer
- To treat the member fairly, a consistent methodology should be applied for all transfer values
- As well as the same financial assumptions for all members (assuming the same level of benefit increases)
- Although if there is an executive section to which this member belongs, the demographic assumptions (e.g. mortality) may differ from other sections of the scheme.
- Because it is the finance director asking to transfer and he has substantial benefits that would be lost in the event of PPF entry
- this request may lead the Trustees to question whether the employer covenant is, in fact, weaker than they think.
- Or it could be to access post April 2015 flexibility
- The trustees should consider any other restrictions e.g. in the Trust Deed and Rules / SFP
- Given the uncertainty around the sponsor covenant it may be appropriate to consider guaranteeing transfer values for shorter periods than usual.
- And consideration of how the funds to transfer would be realised.

The key to scoring well on this question was demonstrating progressive thought on the issue at hand. By following a clear train of thought, many scoring points could be made. Those who applied a less methodical approach missed scoring opportunites.

2 (i) *Advantages*

- A higher initial rate of income is available (120% of annuity)
- The member has flexibility over the income he takes from his pension scheme
- And can tailor his income to his spending patterns during retirement
- E.g. a higher rate of income may be desired early in retirement to fund travel than later in retirement when spending needs will be lower
- He may be able to adjust his income to stay out of higher rate income tax brackets
- It is not a final decision – the option of annuitisation remains open
- And if annuity rates improve he may be able to secure a better annuity at a future date
- Annuity rates are based on the rates of investment return available from bonds
- Net of insurer expenses, capital costs and profit loadings
- Because this is how insurance companies predominantly invest their annuity funds
- The member can continue to invest his pension fund in other asset classes such as equities
- Which have the potential to deliver better investment returns than bonds over the long term
- In which case the drawdown option may provide a higher income over the member's lifetime than an annuity
- Death benefits are likely to be more valuable in the event of early death because the whole of the remaining fund is available
- Member not exposed to insolvency risk of insurer

Risks

- Member's fund is exposed to investment risk
- And lifetime income may be significantly less than under an annuity if returns are poor because there is no investment guarantee
- Income may be variable and unpredictable because of triennial reviews, which may be carried out at unfavourable valuation points
- Particularly if the member is drawing close to the maximum amount
- This is more acute after age 75 when income reviews are carried out annually
- Changing gilt yields / annuity prices may also cause income to be unpredictable
- And there is no hedge against inflation which could be achieved through an index-linked annuity
- Member is exposed to longevity risk
- If he lives much longer than expected, lifetime income may be lower than annuity option because there is no longevity guarantee
- And the death benefit may be lower in such cases

- "Mortality drag" means that the member's fund needs to earn a return in excess of bond returns to maintain an income equivalent to that of an annuity
- This differential increases as the member gets older
- Therefore investing in bonds to match annuity prices and stabilise income is unlikely to deliver a good result over the long term
- Risk of administration, advice and fund management costs eroding value of member's fund
- These costs get proportionately larger as member gets older and remaining fund shrinks
- Because of these risks, drawdown is unlikely to remain a viable option at very old ages and annuitisation may be necessary
- Annuity prices may be more expensive at this point
- Tax / regulatory changes may make drawdown less tax efficient or more expensive
- For example, a reduction to the LTA prior to an annuity being taken
- Drawdown arrangements are complex and not easy to understand leading to members taking poor/badly informed decisions

This question was reasonably answered by most. Better candidates were able to develop the thought process and therefore score higher.

(ii)

- Fund after tax free cash = 75% * £400,000 = £300,000
- Annuity available at retirement = £300,000 / 17 = £17,647 per annum
- Maximum drawdown available = 120% * £17,647 = £21,176 per annum
- Income taken = 90% * £21,176 = £19,059 per annum
- Assuming investment returns uniform in each three year period
- Allowing for investment management and policy fees
- Levied uniformly over each three year period

Roll forward calculation:
Fund value at 1 June 2017 = £300,000 * 1.03^3 – £19,559 * 3 * $1.03^{1.5}$ = £266,481
Fund value at 1 June 2020 = £266,481 * 1.07^3 – £19,559 * 3 * $1.07^{1.5}$ = £261,506
Fund value at 1 June 2023 = £261,507 * 0.99^3 – £19,559 * 3 * $0.99^{1.5}$ = £195,940

- Annuity available at 1 June 2023 = £195,940 / 13.5 = £14,514
- Maximum drawdown available = 120% * £14,514 = £17,417 per annum

(iii)

- Assume that average duration of level pension for a 74 year old is 10 years
- Annuity rate reduces by a factor of $(1.025/1.03)^{10}$ = 95.25%
- Hence maximum income = £17,417 * 95.25% = £16,590 per annum

(ii) & (iii) relatively well answered by most – straightforward calculation question.

(iv) *Reasons for fall in income*

- After investment management fees, the member's fund has only generated a return in line with gilts (3% per annum)
- In order for the member to maintain an income equivalent to an annuity, his fund would need to grow faster than this
- To counter the effects of mortality drag (as defined in part i) of this question)
- However, the member has been drawing in income in excess of the available annuity
- Plus the £500 per annum policy fee
- Drawing this additional income has further eroded his remaining fund
- And hence the future income he can draw
-

Again, relatively well answered – straightforward issues to be addressed.

(v) *Recommended action in the future*

- The member should note that in just 9 years over half of the original fund has been used up
- and consider likely life expectancy (is this normal or impaired?)
- and the need to provide reasonable benefits to dependants on death
- Additionally, the member should identify a minimum level of income (potentially at a subsistence level based on current commitments)
- And the availability of other potential sources of income (such as part time employment)
- If the member continues with income drawdown then the investment risk will continue
- And the impact of mortality drag will become more acute as he gets older
- Although falling gilt yields have not contributed to the reduction in income this time…
- …the calculation above shows that his income is additionally vulnerable to changes in gilt yields / annuity rates
- The annual policy fee will represent a growing proportion of his income as his fund continues to reduce in size…
- …possibly exacerbated by a move to annual income reviews post age 75
- The member has indicated that he is unable to afford large future falls in his income
- This suggests that an aggressive investment strategy is inappropriate
- Because of the risk of large falls in fund value
- and mismatch with annuity rates
- Continuing to draw an income significantly in excess of the available annuity risks a repeat of the experience of the last 9 years if returns are similar to gilts…
- …and a much worse outcome if returns are lower or gilt yields fall
- Drawing an income similar to or below the annuity rate has fewer (but still significant) risks
- Noting that an annuity of £14,514pa is currently available (as per part ii) of this question)

- And that this would provide income certainty for the remainder of the member's lifetime
- It is difficult to see why this is a better option than annuitisation

There was insufficient depth to many answers. Again, a methodical approach to building the points made led to good scores for better candidates.

END OF EXAMINERS' REPORT