INSTITUTE AND FACULTY OF ACTUARIES

EXAMINERS' REPORT

September 2012 examinations

Subject ST4 – Pensions and other Benefits Specialist Technical

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.

D C Bowie
Chairman of the Board of Examiners

December 2012

General comments on Subject ST4

This subject examines the ability of candidates to apply core actuarial techniques and concepts, together with specific knowledge of pensions and other benefit arrangements to simple, but practical situations.

The examiners therefore look for candidates to apply their knowledge of the Core Reading to the specific situation that the examiners asked, having read the question carefully. Too many candidates write around the subject matter of the question in more general fashion, or focus on one aspect of the issue at great length, in either case gaining few of the marks available.

Good candidates demonstrate that they have used the planning time well – an attempt to get a logical flow is a big advantage in making points clearly and without repetition. This also 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 that are roughly proportionate to the number of marks available, for all questions.

Whilst we make no comment on the order in which candidates attempt questions, we do suggest that candidates plan their answers to the whole paper at the beginning of the examination, in particular identifying the important information in each question, and the specific instruction. Also, candidates may wish to avoid over-refinement or repetition of points on earlier shorter questions (which might at best score an extra mark) at the expense of time spent exploring the longer questions (which might identify a more productive seam of several marks or more).

Comments on the September 2012 paper

The Examiners were pleased to see a second successive high pass rate for this paper, with many candidates showing that they understood the underlying syllabus by producing concise, logically structured solutions that addressed the specific context and instructions provided in the questions.

Candidates generally scored very well on questions 1 and 2, reasonably on questions 3 to 7, but particularly poorly on question 8. The relatively poor collective performance on the final question seemed, at least partially, to be a result of poor planning and time-keeping – this was a question that required some reasoning and explanation.

1 (i) *Reasons for member data checks*

- Incorrect benefits may be paid to members
- Legislative requirement to ensure benefits paid in accordance with the scheme's rules
- Can add significant costs
- E.g. error correction, future buy-out
- Uncertain assessment of financial liabilities / actuarial valuation
- May lead to inappropriate advice
- Incorrect contributions may be made
- Insufficient funds may be held by the scheme as a result
- Fines may be imposed
- Or removal of tax status resulting from non compliance

(ii) *Range of data checks*

- Membership reconciles with previous valuation
- Missing data
- Common sense checks
    - E.g. no new entrants recorded
- Comparison with other sources of data
    - E.g. from group life scheme or employment data
- Data consistency
    - E.g. average salaries at current and previous valuation
- Data validation
    - E.g. min & max ages
- Random spot checks and benefit calculations
- Focus on members with largest liability and items that have the greatest impact

Answered well by most candidates. Those candidates that didn't score well typically focused on only one type of data check or considered the impact on just one of the stakeholders.

2 (i) *Options available to the government*

- Educate/ require education about the importance of providing for the future (e.g. providing advice)
- Provide tax relief for
  employers' contributions
  employees contributions
  investments
  benefits
- Direct cash incentives
- Capping charges on pension products
- Provide minimum pension benefits to all directly from the government
- Or means test benefits and top up for those who do not reach the minimum
- Create value for money pension products
- With a simple standardised product

- with low costs and administrative efficiencies
- introduce legislation to regulate private benefit arrangements / instil confidence in the system
- introduce auto enrolment
- increase pension flexibility e.g. pension age

(ii) *Compulsion*

Advantages

- To ensure adequate pension provision is made by all the population
- Prevents future reliance on the State
- May reduce the Government's long term budgets
- Promotes awareness of future pension provision
- The alternative arrangement set up by the Government could be used by an individual for all employments
- Could encourage greater trust in pension providers / ensure greater security of invested contributions
- Positive macro-economic impact (giving a suitable example)

Disadvantages

- may be unpopular with employers & individuals
- As may be perceived as an additional "tax"
- Employer profitability may reduce and employment reduced
- The low paid may be unable to afford
- Unemployed are unable to make contributions
- Wealthier individuals may have other demands for contributions
- May be significant costs in setting up the alternative pension arrangement
- May be poor value for money if charges are passed on
- Difficulties in setting minimum contribution to ensure adequate pension in retirement / the minimum becomes the 'standard' rate
- And ensuring contributions are made by all the population
- Existing private pension schemes may need greater State regulation

This was the best answered question on the paper, at least in terms of the average proportion of the marks available. A few candidates, however, failed to read the question carefully, including compulsory contributions in their lists for part (i), or ignoring the instruction to discuss pros and cons of compulsion in part (ii) e.g. by simply stating "this would be unpopular", "this would be unfair" etc., without explaining why.

3 (i) *Key features of contracts*

Group Life Insurance

- Covers lump sum payments on death in service
- Typically a very competitive market, so minimal profit margins in pricing
- Usually charged for on a recurrent single premium basis
- A unit rate is determined at inception according to age and gender distribution
- And is applied to the total sum assured during the period of the guarantee

- A free cover level is usually offered
- i.e. insurer will provide cover for individuals in the group without medical evidence
- Experience / profit sharing is common for larger schemes
- For the spouses death in service pension the insurance cover may be achieved by insuring a larger lump sum out of which the spouses pension will be paid
- Alternatively the death in service spouse's pension could be insured
- Stop - loss / catastrophe insurance (with an example)

Non profit annuities

- A lump sum is generally paid at retirement to an insurer to match a member's retirement benefits
- May be an immediate or deferred annuity
- The annuity may be level, increasing at a fixed rate or in line with an index to match the promised scheme benefit to the member
- Payable for life
- With for example a guarantee period and / or widow's benefit
- The cost will include loadings for insurance company profits, administration and contingencies
- The liability is transferred to the insurance company
- But can be purchased in either the scheme's or the member's name
- With-profit and unit linked products may also be available
- Which would enable the pension scheme to benefit from experience that is better than assumed in the annuity terms
- Reasonably competitive market/pricing may exist
- ... and may not be able to match increases in scheme rules (e.g. LPI, discretionary increases etc)

(ii) *Risk reduction*

Lump sum insurance

- There is greater predictability in the cost of the death benefits with insurance
- Reducing the potential for large variability in claims if there is no insurance
- And very large individual claims relative to the size of the assets
- Avoids adverse mortality experience
- The resultant investment strategy does not have to allow for variability and size of death claims
- E.g. reduced requirement to hold liquid assets

Spouse's pension

- The value of accrued benefits may be relatively small so an insurance contract will remove the risk of the claim exceeding the reserve held
- Reduces unpredictable cash flows but as the dependant's pension is paid out periodically rather than in one large lump sum this is less an issue compared to lump sum death benefits

- Or if benefit is based on prospective service removes the longevity risk

Pensions on retirement – Immediate annuities

- Removes the mortality risk in retirement
- Removes the investment risk in retirement
- Removes the inflation risk if the benefit is linked to an index
- Removes risk of expenses of paying out pension being greater than expected

Generally answered well, but it appeared that some candidates neither read the whole question first, nor followed the instruction in part (i), so covering material that was specifically relevant to part (ii) in place of the relatively straightforward solution required for (i).

4 (i) *Reasons for increase*

- Reasons may be specific to our company's experience, or due to the overall experience of the insurer (or both)
- Previous loss leading rates may have now expired
- There may have been a large number of recent claims leading to the premium rate being increased.
    - e.g. people fell ill for longer / improving longevity might have increased the average length of claim
- Current provider may no longer be competitive.
- Salary roll increases
- Number of members increased
- Changing age profile of membership
- Changing sex profile of membership
- Change in insurance pricing structure…
- …e.g. due to regulation or competition in market
- Changed market conditions have made insuring income replacement benefit a lot more expensive…
- …e.g. lower bond yields
- The benefit of an income of 75% of salary may have been a disincentive for the member to go back to work
- Tax changes

(ii) *Ways to reduce premiums*

- Suggest market review – may be possible to find cheaper insurer
- Or negotiate with the current insurer to reduce premiums
- Tighten up (or enforce more strongly) ill-health definition to reduce claims
- Introduce active "return to work" or rehabilitation programme to shorten length of claims
- Reduce benefits, for example
- Consider scope to reduce 75% benefit level…
- ...e.g. percentage applied, salary definition used, or introduce a salary offset
- Increase waiting period e.g. from 6 months to 12 months

- Review 3% per annum escalation rate
- Consider time limit on claims, e.g. 5 years, rather than to age 65 (or reduce age 65 limit)
- Examine self-insuring…
- …but self insurance increases risk to the Company
- Have members meet part of the cost…
- …perhaps on a flexible benefits basis
- Reduce number of members eligible for benefit

This question invited candidates to consider all the reasons for a premium increase. A full answer required candidates to consider all the stakeholders involved. Some candidates focused on one party in great detail, missing some more obvious possibilities elsewhere e.g. covering the insurer's business at great length, but not mentioning increases in the employer's membership or salaries (or vice versa). A full answer to both parts was also easier to generate if candidates considered factors that affect the incidence, size and persistence of claims.

5 (i) *What are Flexible Benefits?*

- employees are offered the option to revise the level of an existing benefit
- or to choose different benefits
- which the employee "buys" either by reducing their pay
- or by giving up part of their existing benefits

(ii) *Why provide them?*

- Ensuring best VFM for their expenditure by targeting benefits that members appreciate
- Targets benefits that members appreciate
- recruiting, retaining, motivating and empowering employees (... or "competitors provide them")
- recognises that employees' needs change over time
- feel that it is inappropriate to provide all employees in an organisation with the same benefit package

(iii) *Main issues to consider*

- What benefits should it offer?
  - What are its competitors doing
  - What is common practice in the country
  - What do the employees want?
  - Are there any tax advantages for certain benefits?
  - Whether there is a state benefit to integrate with?
  - Eligibility criteria

- Choices include
  - Permanent disability benefit (e.g. pension)
  - Different levels of life insurance
  - Subsidised health care: medical, dental, opticians
  - Buy/sell holiday
  - Savings: profit sharing, share plans

- Subsidised goods: e.g. food, housing, telephone, travel insurance, bicycles

- Administration of the benefits,
  - does it need additional staff or will it outsource (cost)
  - pricing of options benefits, i.e. how much salary should be given up
  - Cost neutral to company or at a "profit" e.g. should the company pass on any tax benefit?
  - There will be a trade-off between attractiveness (many options)
  - and simplicity (few options)
  - Including how often members can review their choices
  - And how often the terms should be reviewed
  - Online administration will allow employees to self-administer and reduce costs

- Maximum and minimum of any benefit
- Legislative requirements (e.g. statutory minima / maxima)
- Whether to insure with third party e.g. life insurance
- (will depend on size of company and/or pension scheme)
- Communication of benefits to staff
- HR manpower planning considerations
- Which options is the employer looking to encourage / discourage
- Decision to insure or self insure the benefits

For parts (i) and (ii), some candidates' solutions made only one distinct point and could not possibly score the full marks available. For example many candidates only mentioned choosing different benefits from a selection, but not the impact on earnings or having different levels of benefit.

For part (iii), the examiners noted that the better-scoring candidates structured their answers with a number of sub-headings (which need not have been those in the specimen solution above). Candidates that scored relatively poorly often listed items without giving examples or explanations – this will not score well when the instruction is to "discuss" an issue.

6 (i) *Funding methods*

General points

- Scheme sponsor will probably prefer a stable SCR
- ...but any method is appropriate as long as all involved understand likely future changes to SCR

- Attained Age funding method
  - "Average" future contribution rate for current membership
  - Which may be suitable given scheme is closed to new entrants
  - Allows for salary growth to retirement
  - No change to accrued liability

- Entry Age funding method
  - Sum of the average rate for all service that would have applied to each member at the age they joined
  - Inconsistent with existing PUM accrued liability?
  - Unlikely to be suitable

- Projected Unit funding method
  - Cost of benefits built up in the next year (or longer control period)
  - Will increase given no new entrants / stable only if average age of active members remains the same
  - May not therefore be appropriate for long term planning

- Current Unit funding method
  - Doesn't allow for future salary growth in accrued liabilities.
  - Reduces the accrued liability
  - Contribution rate will increase significantly as membership ages

(ii) *Definition of terms*

- f = pension accrued per year of service as a percentage of final salary
- Y = number of years' service to be included in the calculation
- S = current salary
- r = inflationary revaluation (other than salary growth) of the pension before payment starts
- e = inflationary revaluation (due to salary growth) of the pension before payment starts

- Under the basic form of the Current Unit method: $Y = 1$ and $r = 0$.
- Under the revaluation adjusted form of the Current Unit method: $Y = 1$ and $r \neq 0$.

- Under the basic form of the Projected Unit method: $Y = 1$ and $r = e$.
- Under a "Unit" method using a control period: Y = length of the control period.

- Under the Entry Age method: $r = e$ and Y = all potential service from assumed entry age,
- x is the entry age.

- Under the Attained Age method: $r = e$ and Y = all future service from age x.

(iii) *New SCR*

- Most appropriate method is Attained Age
- Should provide stable contribution rate if assumptions are borne out

Converting PUM with 1 year period to AAM ...

- ...assuming 20 year average period to retirement
- 20% * 20 / (20 year annuity at (6% – 4%) i.e. 2% = 16.35)

- So revised SCR is 24.5%

Part (i) – Many candidates had a fair attempt at part (i) but some seemed determined to methodically work through all of the criteria in the Core Reading (stability, realism, durability, etc.) for each of the four funding methods. This approach led to a lot of repetition and points which were not specific to the scheme - it was clearly not appropriate given the marks available and the instruction to "discuss the suitability" of each method for the scheme.

Part (ii) – The above solution was taken from the Core Reading, but it did not need to be reproduced in full for candidates to score the six marks available. The examiners wanted to see that candidates understood how the funding methods worked, and in particular, where they differ. Many candidates demonstrated this by defining each variable, the value it took under the PUM, and explaining for which methods it took a different value. This was a good approach that gained equivalent and, where appropriate, full credit.

Part (iii) – If a candidate simply named a method without explanation, partial credit was only given if the method selected was consistent with their discussion in part (i). For the calculation, credit was also given for other (often much longer!) derivations of an SCR that produced a plausible result, but many candidates lost their way doing calculations that were clearly disproportionate to the marks available (which hinted at around two to three minutes' work).

7 (i) *Key features of valuation bases*

Prudent Funding

- The prudent assumptions allow for the uncertainty surrounding the future benefit costs
- Allowing for the assessed strength of the employer covenant
- Assumes the Scheme is on-going
- And supported by the employer over the long term
- The basis allows for the actual investment strategy being followed

Best Estimate assumptions

- Uses the expected outcome for each of the valuation assumptions
- With any contingency margin removed from the assumptions
- Hence subject to greater short term experience fluctuations
- Provides a more realistic cost of the future benefits

Buy-out

- The valuation assumptions are likely to be very prudent
- Often allowing for significant margins e.g. life expectancy
- including implicitly the insurance company profit margins, cost of capital etc.
- The assumptions will mirror those used by an insurance company
- But are unlikely to involve actual insurance company quotations or assumptions
- Assumes all active members will be treated as early leavers

- with no allowance for future salary increases
- Assumes the scheme will no longer be supported by the sponsoring employer
- Wind-up / buyout expenses can be significant

Self Sufficiency
- Assumes the scheme is still on-going, but not dependent on the sponsor to underwrite risks taken
- Assumptions will be prudent
- And may be similar to buy-out assumptions
- But do not allow for insurance company profit margins etc
- May not reflect the actual investment strategy followed
- Typically assumes Government bonds are held to "match" liabilities

(ii) *Purpose of results*

- A particular valuation basis may be a legislative requirement

Prudent Funding
- To determine the future level of contributions that are needed
- Either payments to remove the deficit and / or the future service contribution rate
- Comparison of assets & liabilities assesses the degree of security for the accrued benefits
- Could be used to determine a suitable investment strategy
- To review the financial progress since the previous valuation
- To assess the cost of the level of current benefits provided and their future viability

Best Estimate assumptions
- Provides a more realistic cost of the future benefits
- But is subject to greater short term fluctuations
- May be used by the employer for the Company's financial reporting requirements
- And in the assessment of the financial significance of the benefit obligations

Buy-out
- Provides an estimate of the cost of securing the benefits with an insurance company
- Comparing the assets to the buyout cost provides an assessment of the underlying security of the benefits if scheme is wound up

Self Sufficiency
- Mirrors the cost of "buying out" with an insurance company
- But assumes the scheme is still ongoing
- Provides a financial assessment assuming the investment strategy has been de-risked

Use of alternative valuations

Best estimate

- Allows an appropriate contingency margin to be determined (or helps illustrate the degree of prudence in the prudent funding basis)
- In line with the strength of the employer covenant
- Allows the sensitivity to the valuation assumption to be analysed
- The best estimate "cost" of future benefits can be analysed to determine any benefit improvements or possible reduction in future service benefits

Buy-out

- Allows an assessment of the security of members' benefits
- And hence the reliance on the continued support of the employer
- Used to aid understanding of the fully de-risked position of the pension scheme "the end game"

Self Sufficiency

- Aids long term financial planning if buyout does not happen
- Mirrors the scheme "acting" as its own insurance company over the longer term
- Without allowing for insurance company profit margins etc
- Aids understanding of some of the risks in the pension scheme
- E.g. investment risk
- Could be used as part of a de-risking investment strategy with a movement from return seeking assets to a "safer" matched position

Candidates generally did well on this question, and it should be noted that the length of the solution above goes well beyond that which was required for a passing standard, but reflects the wide possible range of points that could reasonably be made. Further, given the inter-changeability of the points in the solution above on "key features", "purpose of the results", and "how each could be used", candidates were given credit (once) for relevant points made anywhere in their solution to Q7.

8 (i) *Trustees' response*

- The investment strategy needs to considered alongside the strength of the covenant
- Unless the liability profile is very immature (e.g. mostly young active members)...
- ... the suggested change to the investment strategy will increase the risk to the scheme significantly
- Any future adverse investment experience will need to be met by the employer
- The employer and trustees attitude to risk needs to be determined
- The covenant overall is less strong with potential cash flow problems
- This is not consistent with the proposed change to the investment strategy
- Scheme rules may determine who has the power to set the investment strategy

- It may be that the employer does not determine the investment strategy
- The Trustees will need to meet with the employer to discuss the full reasons for the suggested investment strategy change
- Or if any contingent assets are being offered if the funding position falls in the future
- More information is needed on the current and future trading position in general
- The valuation discount rate may reflect the assets held
- And hence we would expect a lower liability if the discount rate increases
- But also will take account of the employer covenant
- With greater prudence possibly being needed in the valuation assumptions to reflect the possible change in the covenant
- So the value placed on the liabilities may actually increase and the funding position worsen

Investment issues

- Matching of assets and liabilities needs to be considered
- Need to consider the alternative to equity investment (even if Trustees willing to increase the level of investment risk)
- Or alternatively, for example, moving from government bonds to corporate bonds

(ii) *Alternatives to contributions*

- Charge on fixed assets
  - This is a legal agreement that the Scheme can claim specified assets of the employer in the event of insolvency
    (or other specified circumstances)
  - Noting there are significant fixed assets available
  - Increases security for the pension scheme
  - Depending on the quality of the assets and the ranking of the charge
  - To the detriment of shareholders
  - Which may restrict the future borrowing capacity of the employer
  - To cover adverse experience (e.g. investment performance)
  - Or employer defaulting on payments

- Company guarantee / credit default swap
  - A legal agreement to underwrite any debts from the sponsor to the scheme
  - The impact for the scheme depends on the strength of the guarantor e.g. a parent company
  - Invest in assets that pay on the employer default e.g. credit default swaps

- Bank Guarantee
  - Paying a lump sum to the Scheme if the employer fails to do so
  - Gives a high level of security to the Scheme at the expense of other lenders and the shareholders

  - May be expensive for the employer and increase cost of capital if required

- Other
  - Consider buying more bonds
  - Consider insuring some of the benefits

- Contingent contributions
  - With the sponsor making up the deficit more quickly if the scheme's financial position deteriorates
  - Alternatively there could be ratchets in contributions so that if the employer's financial position improves then the scheme shares in this improvement

(iii) *Other issues*

- Consideration of the underlying reasons for the more difficult trading conditions and possible cash flow problems
- An analysis and current valuation of the fixed assets on the balance sheet
- Consideration of the employer's other creditors
- Instigate a more regular review of the covenant e.g. quarterly
- Consider bringing forward the date of the actuarial valuation
- Consider undertaking a detailed investment strategy review to better match the scheme's assets and liabilities
- Consider level of future benefits (with an example)

Part (i) – Somewhat troublingly, many candidates seemed all too ready for the Trustees to accept the employer's proposal without any further debate, notwithstanding the question's clear implication of a weakening of the employer covenant at the same time as a significant increase in the scheme deficit. Whilst the question didn't specify the maturity of the scheme and hence the matched position, the shift to equities clearly increases investment risk, yet many candidates' solutions never mentioned the words "risk" or "covenant" at all, and went off on tangential discussion on the possible reasons for the increase in deficit, or the detailed process for switching investments.

Part (ii) – Candidates familiar with the relevant Core Reading, and with time to structure their solutions, scored well on this question.

Part (iii) – Credit was given for any four plausible outlined suggestions, excluding any that would be clearly an over-reaction to the circumstances, and those which would only follow after the sort of analysis above first being carried out.

END OF EXAMINERS' REPORT