INSTITUTE AND FACULTY OF ACTUARIES

EXAMINERS' REPORT

September 2010 examinations

Subject SA4 — Pensions and other Benefits Specialist Applications

Introduction

The attached subject report has been written by the Principal Examiner with the aim of helping candidates. The questions and comments are based around Core Reading as the interpretation of the syllabus to which the examiners are working. They have however given credit for any alternative approach or interpretation which they consider to be reasonable.

T J Birse
Chairman of the Board of Examiners

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The overall standard of scripts was broadly in line with recent sittings. The better candidates demonstrate their understanding by making their answers clear, concise and easy to follow. Less well prepared candidates should appreciate that a brain dump of all they know on a particular topic will not score highly unless it relates to the specific scenario outlined in the question.

For each question, specific comments are included after the model solution below.

1 (i)

- No statutory requirement to provide increases on this element of pension so change can be made.
- Under the current provision, the pension increases to be granted are uncertain.
- There is therefore a risk to the company in relation to how much the increases will cost.
- Level pensions may be easier to match.
- … for instance using fixed interest bonds.
- The cap of 4% p.a. is unusual and may be difficult to insure if this option is ever considered
- Level pension payments will mean that any future improvements in mortality will have less of an impact.
- … as less weight will be put on the payments that are far into the future.
- Expected to reduce cost of ultimately buying out benefits/accounting liabilities.
- The company's offer may not be cost neutral.
- … and may be expected to give rise to a profit for the scheme.
- … and thus lower employer contributions.
- Could be introduced as part of funding negotiations.
- For deferred pensioners the offer is likely to increase the amount that can be taken as a cash lump sum.
- … this will reduce the scheme's exposure to risks.
- … such as longevity and investment risks.
- And if the cash commutation factors are less generous than the scheme's funding basis this will lead to greater potential funding profits.
- The same will follow on the accounting figures disclosed.
- And ultimately the price of buying-out.
- Likely to be popular with members.

(ii)

- Trustee's job is to look after members' interests.
- Including active members who are not (yet) being given this offer.
- The trustees will be concerned that the offer gives fair value to members.
- And that offer does not reduce the security of any member's benefits
- Will need to take actuarial and legal advice.
- If less than cost neutral, S67 means that the Company cannot impose a change in accrued benefits.
- … so any change must be the choice of the member.
- Could seek assurance on how the uplifts will be calculated.

- Depending on how long members live some may be better off and some worse off.
- If the uplifts are calculated using mortality assumptions that reflect the life expectancy of the average scheme member, there may be a selection risk for the scheme.
- Members in impaired health are more likely to accept the offer, leaving lighter mortality for the scheme overall.
- In order to give agreement to the offer, the trustees could require that the mortality assumption used to fund the scheme is strengthened.
- … or the company pay a cash injection into the scheme to allow for this effect.
- Trustees may be concerned about what will happen to the spouses' pensions where members accept the offer.
- … as the member is making a choice that may affect their spouse without the spouse's consent.
- Could require that members sign to say they understand that their spouse's pension will be affected.
- … or ask spouse to consent, although if the Scheme provides a benefit only for spouse at date of death this won't be possible in all cases.
- There is a reputational risk to the trustees if they allow the offer to go ahead.
- Particularly as members may not fully understand the offer.
- … and later seek compensation, perhaps from the trustees.
- May also need to consider how supporting the offer would be viewed by the media or other interested parties.
- The key to managing reputational risk is likely to be good communication.
- The trustees could vet all communication materials to the members.
- Trustees may wish to communicate directly with members.
- They might insist that members are given access to workshops or help lines to aid understanding.
- … or that the company pays for members to see a financial adviser to understand how the offer would affect them personally.
- Provide projections of likely future income under various scenarios.
- Check no undue pressure on members.
- Any financial advice would need to be unbiased.
- PPF levies for the Scheme may increase as members' base pensions are increased.
- The trustees could require that PPF levies are paid directly by the company rather than from the Scheme (or the trustees are reimbursed for the full or increased levy amount).
- Consider Trust Deed & Rules, amendment will be needed.
- Consider tPR guidance.
- If concerns over covenant of sponsor, trustees might be concerned that it will affect PPF eligibility (as PPF benefits higher).
- More complex administration.
- Who will meet cost of the exercise?
- Trustees may be concerned about increase in short term cash requirements through paying higher pensions, need to review investments.

(iii)

- The generosity of the offer (if it better than cost neutral) will affect take up.
- This will depend on the member's own financial circumstances.
- … their attitude to risk.
- … and their view of their own life expectancy.
- The member may have an immediate need for more income which he is happy to forego future income for.
- A deferred pensioner in particular might have a need for an increased lump sum at retirement (to pay off a mortgage or go on a world cruise).
- Many members will put a higher value on cash now vs cash in the future.
- Some members may be wary of giving up their pension's inflation protection.
- … depending on their views on how prices will increase.
- … and how much disposable income they have.
- … members with significant other inflation-linked provision may be less wary.
- If inflation has been low in recent times, members may be more willing to take on the inflation risk.
- Members who are in poor health are more likely to accept offer as they won't achieve the benefit of future increases.
- But even members in good health may underestimate their own life expectancy, making them more likely to accept.
- Members' level of financial sophistication will also affect take up.
- Tax position, might not want higher pension if moved to a higher tax bracket.
- Might lose ability to claim means tested benefits.
- Lack of understanding may cause members to ignore the offer.
- … or take it up even if it's unlikely to benefit them.
- Receiving financial advice will help members to make rational decisions.
- If spouse's benefits affected, talk to spouse.
- Will offer allow for actual age of spouse?

Most candidates appreciated the main issues arising from this topical question although some candidates did not appear to have read the question sufficiently carefully with some suggestions that the relevant members were being asked to give up all pre-April 1997 increases receiving nothing in exchange. Other candidates mentioned issues that are specific to transfer value enhancements, showing recall of the Pensions Regulator guidance on incentive exercises, but failing to demonstrate that they understood how to apply it to the less common scenario.

In part (ii) some candidates chose to write about the concerns of the employer.

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(i) *Five-year projection*

Deficit is £160m less £140m = £20m
Annual Deficit Contribution (ADC) formula is ADC × (10-yr annuity @ 6%) = £20m
Assuming continuous payment, annuity is $[1 - 1.06^{(-10)}]/\ln(1.06) = 7.58$
ADC is therefore £2.64m per annum
Regular sponsor contributions are 20% of Pensionable Salaries i.e. 25% total less 5% members
No information to determine impact of active joiners/leavers and retirements (and less likely, deaths).
Assume scheme open to new members and no net reduction in number of active members due to movements.
So year 1 = £10m × 20%
Increasing each year by 4.5% (salary increases) at end of year

If assumption that scheme is closed to new members, could assume rising salaries offsets reduction in active members giving a constant total pensionable salary for the next five years.

Then five-year projection is as follows:

Year	*Regular Contributions £m*	*Deficit Contributions £m*	*Total £m*
1	2.00	2.64	4.64
2	2.09	2.64	4.73
3	2.18	2.64	4.82
4	2.28	2.64	4.92
5	2.39	2.64	5.03

(ii) *Experience loss needed for 50% rise in sponsor contributions*

50% increase in sponsor contributions is 0.5 × 4.64m = 2.32m
This is equivalent to additional deficit of 2.32/2.64 × 20m = £17.6m
(or 2.32 x 7.58 = 17.6)

(iii) *Likely source of loss*

Possible sources of loss in general

- fall in asset value
- increase in liabilities due to financial factors (e.g. salary increases, pension increases)
- increase in liabilities due to demographic factors (e.g. early retirements, fewer deaths than expected)
- increase due to augmentations or bulk transfer on generous terms

- legislative change or benefit improvement which retrospectively increases the value of benefits

Loss of £17.6m is approximately 13% of assets.
But is approximately 60% of active liabilities, 35% of deferreds, 22% of pensioners, 10% of total liabilities)

Caps on increases and revaluations would limit impact of very high inflation (deferreds and pensioners).

Salary increases 60% higher than assumed seems unlikely!
Mortality assumptions appear prudent so unlikely to significantly understate longevity.

Asset values are volatile.
Scheme likely to be invested in some return seeking assets.
13% fall is plausible.
So a short-term loss is most likely to be investment-related.

(iv) *Fall in discount rate needed for 50% rise in sponsor contributions*

From (iii), an experience loss of £18m / 10% of liabilities triggers this rise.
A 1% fall in the discount-rate post-retirement will add 12–14% to the accrued liabilities on its own.
Allowing also for pre-retirement reduction, and impact on regular cost, answer must be << 1%.
So, first calculate the impact of a 0.5% fall in discount rate.

Assumptions needed

Term to retirement for active members is 15 years
Term to retirement for deferred members is 10 years
1% fall in discount rate post-retirement increases active and deferred pensioner liabilities by 14%
1% fall in discount rate post-retirement increases current pensioner liabilities by 12%

Impact on normal cost

Total normal cost increases to $25\% \times 1.005^{15} \times 1.14^{0.5} = 29\%$
Impact on sponsor's regular contributions is an increase from 20% to 24% of pensionable salaries

Impact on accrued liabilities

Pensioners $80\text{m} \times 1.12^{0.5} = 85\text{m}$
Deferreds $50\text{m} \times 1.005^{10} \times 1.14^{0.5} = 56\text{m}$
Actives $30\text{m} \text{ x } 1.005^{15} \times 1.14^{0.5} = 35\text{m}$
Total = 85 + 56 + 35 = £176m

Deficit Contributions

Revised deficit is 176 – 140 = £36m
10-year annuity at 5.5% p.a. is $[1 - 1.055^{(-10)}]/\ln(1.055) = 7.74$
Revised ADC is 36/7.74 = 4.65m

(Note: although not specifically stated by the question, most candidates adjusted the Recovery Plan return, this was accepted and so this solution has been prepared on this basis).

Year 1 contribution requirement

Regular 24% × £10m = £2.40m
Deficit funding = £4.65m
Total = £7.05m

Which is close to 1.5 × 4.64 = 6.96m (the sponsor's 50% threshold).

So a fall in discount rate of approx ½% will trigger the 50% increase in sponsor contributions.

(v) *How trustees might use these results*

(ii) to (iv) provide some information about the magnitude of the events that would cause a problem in the short-term.

Contribution requirements very sensitive to small changes in assumptions.

May be happy to let the longer term experience losses emerge at future valuations so focus on potential investment losses / changes in market conditions.

Need specialist advice (investment and actuarial) to form a view of the probability of these changes and whether the risk is sufficiently small to ignore.

Scenarios are artificial, so need to consider combinations as well
e.g. smaller simultaneous fall in assets and yields might trigger the 50% increase

Conversely, if well matched, value of liabilities may fall at same time as assets
Again, specialist advice needed.

Does the sponsor's statement alter the trustees' view of the Sponsor Covenant?
i.e. did they think the sponsor could absorb bigger increases (than 50%)
Is this a statement of willingness rather than ability to pay?
If so, may need to consider a wide-ranging review

- reassess sponsor covenant
- review actuarial assumptions

- review investment strategy
- consider future accrual

Noting that these are inter-linked
e.g. a weaker covenant might lead to a more conservative investment strategy which in turn results in stronger actuarial assumptions,
or a stronger funding target (eg buyout)
Any of these leads to an increased deficit...
...and trigger the increase in contributions which the sponsor was concerned about.

But other measures for seeking security are open to the trustees, eg

- seek bank guarantees
- charges on assets
- contingent contributions
- credit default swaps
- ratchet on contributions if things improve perhaps combined with a longer recovery plan to reduce the annual amount of deficit funding in the short term

General actions:

- check / review SFP
- check / review SIP

As expected most candidates made a good attempt at parts (i) and (ii) but it was disappointing that some candidates lost marks by not reading the question carefully enough (e.g. using a five year recovery plan) or by apparently not noticing that their answers were unreasonable. The examiners encourage candidates to do a broad reasonableness check on their arithmetical answers. A few candidates may have been attempting to allow for some investment out-performance on existing assets in determining recovery plan contributions (e.g. by projecting the funding position in 10 years' time), but often without explicitly stating they were doing so and making it clear how, or checking the plausibility of their answers against the straightforward present value calculation.

In part (iii) most candidates could identify the possible loss sources but few demonstrated the possible magnitude of each loss and even fewer suggested which were most likely to occur. Given the link in the question to part (ii), and the content of part (iv), it was surprising that many candidates wrote at length about changes to the assumptions.

For part (iv), very few candidates considered the impact on the accrual cost. Whilst this did not significantly change the answer in this particular case, the examiners were looking for candidates to show they understood that a fall in discount rate would affect the cost of future accrual as well, and full marks for this part depended on doing so. Answers to (iv) that were otherwise complete were of a passing standard, but this was another opportunity missed for many to pick up some straightforward marks.

Part (v) was reasonably well answered with the better candidates appreciating that a change of investment strategy alone was unlikely to be the answer.

3 (i) The Statement of Investment Principles is

- A written statement of the principles governing decisions about investment for an occupational pension scheme
- And should be reviewed every three years or after any change in policy
- Prepared and maintained by trustees of the scheme
- Having taken advice from a suitably qualified person
- And having consulted with the sponsoring employer
- It should set out the trustees attitude to investment risk
- And the broad asset categories in which assets are to be invested
- Providing guidance on the variations allowable from this target allocation
- And the expected returns from these categories
- And provide guidance as to how this asset allocation may develop over time
- As well as stating
    - Permitted geographical/currency allocations
    - Social/ethical considerations
    - Trustees objectives
    - Mandates of managers
    - Investment charges
- It may describe triggers for switching of assets
- And may define specific asset classes or particular investments which are not allowable

(ii) The main sources of cashflow are:

- Ongoing Contributions from employer and members**
- Deficit Recovery Contributions*
- Other employer contributions*
- Investment income
- Transfers in/out
- Regular Payments to pensioners and other dependants**
- Lump sum payments on death of a member
- Pension Commencement lump sums on retirement**
- Professional and Administration fees*
- Investment expenses
- Insurance premiums*
- Regulatory levies

(iii)

- Estimates will have to be made for each of the items of cashflow listed above
- These will have to be done on a realistic basis
- To give a best estimate of the cashflows
- Rather than a prudent basis as applies in the Scheme's funding plan
- Some will need limited assumptions as for a short term year period they will be relatively fixed – these are marked by *
- Others will require some actuarial assumptions to be in place – these are marked as **
- Financial assumptions for levels of benefit, and
- Demographic assumptions for whether benefits are paid
- Given the actuarial assumptions, the actuary will be able to project the benefit payments to be paid by the scheme over the next 10 years
- These should cover both accrued benefits and those based on future service
- Benefit cash-flows may be provide in tranches e.g. types of increase in payment
- Similarly future member and employer contributions can be projected
- Although assumptions regarding incidence of new entrants could be challenging (so may be ignored)
- Future contributions will reflect the rates shown in the latest Schedule of Contributions
- Possible adjusted to reflect the anticipated position at the next valuation date
- Could choose to ignore transfers out unless established regular practice
- Usual to ignore transfers in as unlikely to be able to predict what level of future additional benefit payments these will give rise to
- The figure for investment expenses can be based upon an assumption from the investment adviser herself
- The allowance for Regulatory levies may be straightforward if there is a clear formula in place for future years
- The remaining cashflows are very difficult to state with any precision
- As there are many contingencies on which they are based
- Assumptions similar to those used for a valuation may be of limited value
- As these assume a smoothed experience over a long period
- And short term cash flows will be much more discrete in nature
- For example the estimate of death in service benefits might be nil,
- But with a wide potential variance
- As a single death may require a significant cashflow strain
- Unless benefits are fully insured.
- The expected investment income might be volatile
- Although if there is limited buying and selling of stock, actual short term coupons, dividends and redemptions might be relatively easy to predict

Additional caveats

- Relied on data provided by administrators
- Contributions likely to increase if investment strategy becomes more cautious
- Option terms (eg commutations) assumed to remain constant (or may allow for review from time to time?)
- Assumed no future change to the benefits provided by the scheme
- There is no such thing as definite cashflows
- There are expected cashflows
- Some of which are relatively fixed and others are more volatile to differing degrees
- assumptions used are just that and others could be plausible
- The response to the investment adviser should therefore include some sensitivity analysis
- Particular uncertainty around longevity and allowance for future mortality improvements
- Additional improvements would change the shape and extend the term of the cashflows allowance for mortality

(iv)

- The assumptions used to assess a appropriate Technical Provisions will have to relate to the Statement of Funding Principles
- So will need to be prudent, consistent with those used in setting the Statement of Funding Principles
- Unlike those used for assessing cashflows which should be realistic
- The assumptions used for the Technical Provisions will be long term in nature
- And some options may be ignored if either cost neutral or beneficial to scheme's finances
- E.g. commutation at retirement
- Early retirement
- Transfers out
- Cashflow assumptions could be much more short term
- and allow, for example, for short term inflation expectations
- Or company plans for restructuring workforce
- Cashflows could be net of inflation, leaving investment adviser to adjust for this

(v) (a)

- The assumptions for investment return used in setting the Technical Provisions might reflect the average long term expected returns of the proposed investments over the long term
- Reflecting both prudence and any planned changes in investment strategy over time
- And may use different rates of return for pre and post retirement liabilities

- Linked probably to the long term gilt yield with possible allowance for other bond investments
- And any prudent risk premium for other real asset holdings
- Whereas the assumption for setting cashflows should reflect the best estimate of actual returns achievable each year for the next ten years
- So will reflect actual investments now and planned changes annually
- And will likely be driven in the short term by the views of the investment adviser
- Deriving actual income from expected dividends and bond coupons/redemptions

(b)

- Long term pension increase rates may be derived from the gap between conventional and index linked gilts
- Possibly adjusted for market supply issues
- Giving a rate of the order of 3%
- Whereas for the cashflow projections initially current RPI should be considered
- With assessments made for how that might alter annually
- For example remaining high for a period before perhaps reducing
- This would reflect shorter term economic conditions/expectations
- Then settling down to a rate consistent with the long term rate for Technical Provisions

(c)

- For cashflows actual expected work requirements need to be factored in
- Such as timing of actuarial valuation, of investment reviews etc.
- For technical provisions, not clear how reserve set
- Could be arbitory figure or present value of expected contributions

(vi) Benefit Claims

- The key sources of uncertainty in cashflows are around unexpected benefit claims
- Such as payment of death benefits
- Or retirements taking place other than at normal retirement age
- Insuring death in service benefits can remove the uncertainty for them as insurance premiums can be agreed in advance
- Could consider purchasing annuities to match pensions in payment
- And the trustees may wish to limit access to early retirements if the rules allow
- Or alternatively require the sponsor to fund any resulting strains in the short term

Investments

- Uncertainty from investment return can be mitigated by investing in assets which match the liabilities
- Which, particularly in the short term, will provide relatively certain income, both in quantum and timing
- Or more complex asset classes might be used although size of scheme may not make this practical
- And such solutions may have unattractive long term consequences of limiting total returns
- Or may be expensive or difficult to implement

Expenses

- There may be uncertainty around payment of professional and administration fees
- In particular relating to the timing of these expenses
- Which may be addressed by negotiating fixed fee, fixed term contracts with suppliers
- With agreed payments and timings over a set period
- Or by setting a funding plan that passes expenses direct to the sponsor
- The timing of regulatory levies may be very predictable, although amounts may vary
- This can be mitigated by setting a funding plan that requires the sponsor to pay levies
- Planning and managing credit scores and deficits can help add certainty

Member Options

- Consider refusing transfers in
- The management of transfers out is much harder as it is a member option exercisable at any time
- Although timing of payments can be controlled over a period within the regulations

De-risking

- Might talk to sponsor about de-risking opportunities
- Eg enhanced TV exercise, pension increase exchange
- Likely to increase short term uncertainty but reduce longer term uncertainty

General

- The most straightforward solutions might be
    - Insuring uncertain benefits
    - Selecting more secure assets
    - Passing expenses and levies to the sponsor

- Other solutions might be seen as too restrictive from a long term funding perspective

(vii) (a)

- There will be immediate changes to contribution levels
- Reducing the inwards cashflow for these items
- And a reduction in expected future benefit payments
- There may be a review of investment strategy
- Resulting in significant short term cashflows both in and out
- As investment switches take place
- There may be reduced uncertainty as death benefits cease to accrue
- But greater risk of transfer activity requiring cash outflows
- In additions there may be greater expenses for the closure exercise, administratively, actuarially and legally
- Although long term administration costs should reduce

(b)

- Closure to accrual may well lead to a more cautious investment strategy
- With the certainty of an ageing membership and corresponding shortening average liability term over the periods being reviewed
- So although initial asset allocations may be little changed
- The longer term position will change dramatically
- Trustees may start to consider lifetime of scheme and start to plan for eventual wind up
- Short term the curtailment may improve the funding position and allow more investment freedom
- But this scheme is likely to remain in deficit.
- Liquidity will become more important
- Which might constrain investment freedom
- Term of liabilities will reduce so may choose to invest in shorter dated bonds

Parts (i) and (ii) were well answered.

Candidates generally found part (iii) challenging, with many appearing to answer a previous ALM question. Very few covered the caveats that would need to be provided, missing out on some straightforward marks. What was also disappointing was how few of the candidates appeared to have used their (typically complete) solutions to part (ii) as a prompt to structure and/or generate additional points in (iii). Finally on part (iii), candidates should note that the length of the model solution provided is intended to illustrate the range of points that the examiners considered might be made to a relatively open question such as this - it should not be taken as the required length of a full solution. There are over 40 separate points in the model solution and, with 11 marks available, any script that included around 20 relevant points without repetition, had a logical structure, and covered the caveats to some extent, would score very close to full marks. Fewer points were needed to reach a passing standard.

For parts (iv) and (v) most candidates only considered prudent/best estimate issues and didn't cover the short/long term considerations.

For part (vi) the examiners were looking for a discussion on how to reduce uncertainty in the pension schemes finances, rather than a discussion on how to finesse the calculated cash flows. Again there was evidence of not reading the question as very few considered which strategies would be most appropriate. Similar points to those made above for part (iii) regarding structure and extent of solutions also apply.

Part (vii) revealed a certain lack of planning and a further misreading of the question. Closure to future accrual is <u>not</u> the same as closure to new entrants.

END OF EXAMINERS' REPORT