

EXAMINATION

April 2007

Subject ST4 — Pensions and other Benefits Specialist Technical

EXAMINERS' REPORT

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.

M A Stocker
Chairman of the Board of Examiners

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Comments

As for the September 2006 exam, overall the standard was disappointing; the marks were relatively low for a straightforward paper. This continues to be a combination of:

- *not reading questions carefully, or assuming a question is the same as seen on past papers*
- *assuming UK practices apply; and*
- *failing to write enough separate points*

It would appear that the lack of a specific pensions investment question unsettled some candidates so the investment issues were sometimes overdone at the expense of the rest of a question. In particular, asset liability modelling was weaved into answers for Q1, Q2, Q3, Q4 and Q8!

Our comments on the specific questions are set out below:

- Q1** *Poorly answered. Candidates generally only managed to come up with cost savings as a reason in part (i). Very few candidates noted that there would be a reserve held in the scheme which could help to pay for the spouse's pension. In part (ii), most candidates discussed the equation of value but didn't expand on the practicalities of using this to determine the lump sum amounts to insure — what basis to use, assumptions about dependant (age gap was mentioned but few mentioned the need to consider the likelihood of a dependant), rounding to give easily insured multiples of salary etc.*
- Q2** *Marks were fairly average and given that this was a straightforward bookwork question which stated the areas that needed to be covered, this was surprising. A number of candidates thought that, under the heading "Valuation basis and prudence", they should discuss whether to allow for cash in the valuation basis, rather than commenting on the use of the valuation basis to calculate the commutation factors.*
- Q3** *Generally well answered.*
- Q4** *Well answered, although some candidates just set out the standard DB/DC advantages/disadvantages.*
- Q5** *Very badly answered - candidates seemed unprepared for a numerical question requiring them to switch between different valuation methods. Few candidates realised that they needed to calculate the PU rate first rather than jumping straight to the CU rate. In part (ii), most candidates noted that the CU rate can exceed the AA rate but didn't explain why in much detail. In particular, very few candidates specifically mentioned the revaluation element of the CU rate.*
- Q6** *Part (i) was well answered. The answers to part (ii) and particularly part (iii) were generally too brief.*

- Q7** *This was similar to a question at a recent sitting so candidates who had looked at past papers as part of their revision were advantaged. Most candidates had a reasonable attempt at part (i) although there were a surprising number of basic errors e.g. dividing by the interest rate rather than multiplying, forgetting to include the contributions or pensions paid from the asset roll-forward etc. Candidates also struggled or forgot to state the assumptions they were making in their calculation. Part (ii) was well answered.*
- Q8** *Parts (i) and (iii) were very poorly answered. Part (ii) was generally well answered, which meant candidates had learnt ways to assess the employer covenant but did not appear to understand why it is important to assess it. Many candidates demonstrated little knowledge of how contingent contributions operate.*

- 1
- (i)
 - Insurance premium rates may appear less competitive for pension.
 - Particularly when compared to lump sum.
 - Looking to save costs.
 - Therefore may not look to replace the pension with an actuarial, equivalent lump sum
 - perhaps deliberately under insuring & self-insuring part of the risk.
 - After all the retirement reserve would be released on death.
 - Large scheme so can accept greater risk of cashflow mismatching
 - May actually pay out this lower lump sum rather than the pension by changing the benefit structure going forward.
 - Gives beneficiaries more flexibility with large lump sum,
 - as compensation for reduction in actuarial value of total benefits.
 - Consider market practice, competitor trends etc.

 - (ii)
 - Firstly determine the actuarial lump sum equivalent of the dependant's pension.
 - This could be on a basis close to insurer's terms, the basis used for funding the pension scheme, or the company accounting basis.
 - Company may choose cheapest basis which could be funding, as likely to allow for some equity returns long-term, no insurer's margins for expenses/profit etc.
 - Consider the likelihood of there being a dependant, need to allow for proportions married, chance of dependant children etc.
 - Based on general population statistics as scheme too small to provide credible experience.
 - Then establish annuity cost of the pension based on assumed age of dependents in relation to age of member at death.
 - $\frac{1}{3}\text{rd salary (inflated to date of assumed death i.e. } \frac{1}{2} \text{ year)} \times \text{annuity} = \text{lump sum equivalent.}$
 - Sponsor then needs to decide whether it insures different lump sum for different members.
 - This would still involve some rounding of lump sum and age banding to reduce the number of different multiples.
 - Alternatively insure same extra multiple for everyone — recognising there may be profit/losses in relation to each death.
 - But sponsor may deliberately round down (under insure) to reduce cost, allow for self-insurance and release of retirement pension reserve on death in service.

2 Scheme documentation & legislation

- The scheme rules may specify who has the power to set the factors e.g. trustees, employer, actuary
- and on what basis they should be set e.g. equivalent value to pension given up
- Legislation (or rules) may specify how much of the pension can be exchanged for cash
- and any maximum or minimum factors that have to be used

Valuation basis and prudence

- Only the post retirement assumptions are relevant
- The factors could be calculated using the valuation basis
- but this will incorporate “cautious” assumption hence may not be considered appropriate
- A general aim is usually cost neutrality
- hence a more realistic valuation basis may be used
- trustees may want to set terms to encourage take up of option and thus reduce longevity risk
- It is unlikely the factors will vary with market conditions
- Need to consider what allowance if any would be made for discretionary pension increases

Administration considerations

- Theoretically calculated factors may be “smoothed” for practical purposes
- Should sex dependent factors or unisex factors be used
- Full commutation may be permissible for small amounts of pension
- Factors are usually changed infrequently
- Expenses of exercising and administering the option need to be allowed for
- Implementation issues eg honour existing quotes (if beneficial to member)

Other general issues

- Is the tax treatment different for pension and cash and if so, should this be allowed for?
- Consideration of any possible selection against the Scheme, e.g. members in ill-health
- This is likely only to be significant if the majority of the pension can be commuted for cash
- Should the funding position be allowed for e.g. amount reduced if the scheme is not fully funded
- Should different factors be used if the member is retiring in exceptional circumstances of serious ill health
- and hence the member's life expectancy is very short
- Should any spouses pension be allowed to be commuted for cash?
- Consider member expectations

3 Advantages

- Removes the liability in respect of current pensioners
- and hence removes the longevity risk,
- the investment risk,
- and the expense / administration risk
- May be purchased on favourable terms if the annuity market is competitive or special tax considerations
- May reduce administration costs
- A “bundled” package of administration and actuarial service may also be offered on competitive terms
- Likely to improve the security for pensioners
- Purchasing annuities may be needed on possible wind up
- May free up investment policy for the remaining assets

Disadvantages

- The rates will include an allowance for the insurers expected profit and insurance company margins
- Terms may be uncompetitive
- The purchase of the annuity is effectively an irrevocable decision to invest in bonds at current market prices
- There may be difficulties in purchasing an annuity that precisely matches the benefit promise
- Granting discretionary pension increases will be complex
- Any potential profits from mortality, investment and expenses are passed to the insurer
- In particular members in poor health may be insured on “standard” terms
- Future increases in the cost of annuities is outside the control of the pension scheme
- and may cause a strain compared to the funding basis
- Reduces the security for remaining active and deferred members
- Possible Insurer default risk
- Reduces the total funds under investment and hence reduces investment options
- Large amounts of liquid funds will be needed at the members' retirement dates
- and disinvestment of assets at these retirement dates may be at an inappropriate time
- hence a constrained investment strategy may need to be followed
- there may be communication issues with retired members as the pension is paid by a third party

4 DB scheme closure

- What are competitors doing?
- Run as a closed scheme or wind-up?
- Keep salary link on accrued benefits?
- Investment strategy may need review to take account of
 - ageing liability profile
 - cashflow considerations
- Need to consider what to do with any surplus/deficit
- Might want to offer TV to DC perhaps on enhanced scale

DC scheme design

- Occupational arrangement with trustees or contract based?
- Former offers more flexibility/ownership but perhaps at a slightly greater cost.
- Contribution scale:
 - Salary base (include bonuses?)
 - overall cost constraint
 - age-related scale to “mirror” old DB possibly, but consider how many bands, is the scale fair between differing age bands
 - service related perhaps, rewards loyalty
 - core contributions plus matching, encourages extra provision by employees, matching level 1×, 2× etc
 - is there a minimum employee contribution (compulsory?, perhaps to fit in with State requirements)
 - separate rates for executives?
- Investment fund range required.
- Is there to be default fund.
- Life styling option available?
- Given the type of members, perhaps there needs to be an extensive range of funds offered (restrictions on how many free switches in a year etc?)
- Consider risk benefits e.g. ill-health and death-in-service.
- Such benefits do not fit with DC concept nicely particularly paying pensions on death/ill-health, so may need to offer separate lump sums, to be insured probably.
- Decide whether to buy annuities at retirement or provide pension within scheme

General

- What are overall aims of change?
- What about other options? Have these been considered?
 - e.g. Revalued career average
 - reduced accrual rate
- Consider overall cost considerations:
 - perhaps less aggressive investment strategy also impacting on underlying cost of DB.
- Possible HR issues with any change
- Cost of change: communication, professional fees etc.
- Are there any legal restrictions?
 - in scheme documentation
 - or terms of employment
- Integration with State benefits — impact, costs etc.

- 5 (i) SCR = 22% but this includes expenses / insurance premiums of 2.4%.
So net = 19.6%

Adjust a 19.6% cost of accrual on AAM to a CUM rate with 1 year control period.

Convert to PUM first

$$\begin{aligned}
 & 19.6\% \times a_{10}/10 \times 1/a_1 \text{ where } a_n \text{ @ interest rate} \\
 & i = (1.06/1.0475 - 1) \text{ payable continuously} \\
 & = 19.6\% \times 0.1 \times (1 - v^{10}) / (1 - v^1) \\
 & = 1.96\% \times 0.1118595 / 0.0117924 = 18.6\%
 \end{aligned}$$

If deferred benefits assumed to increase in line with price inflation the calculation would be as follows:

Next convert to CUM (accrual element)

$$\begin{aligned}
 & 18.6\% \times [(1.03)/(1.0475)]^9 \\
 & = \underline{16.0\%} \text{ CUM - Accrual rate}
 \end{aligned}$$

CUM also has a “revaluation component”

Standard fund (Accrual Liabilities) on AAM = £108m based on accrued service to valuation date but salaries projected to retirement

Estimate equivalent liabilities allowing for deferred revaluation only

$$= 108 \times (1.03/1.0475)^{10} = \text{£}91.25\text{m}$$

Add back salary increases for control period

$$91.25 \times [(1.0475/1.03)^1 - 1] = \text{£}1.55\text{m}$$

Express as percentage of pay

$$1.55 / [1\% \times 40 \times a_1^{6\% / 4.75\%}]$$

$$= 1.55 / 0.4 \times 0.9882 = 3.9\%$$

Total CUM rate (Accrual & Revaluation)

$$= 16.0 + 3.9 = 19.9\%$$

Add back expenses / insurance premium of 2.4%

$$\text{Total SCR} = 22.3\%$$

Credit was given for calculations that assumed a different (or nil) level of deferred revaluation if this was consistent with the assumptions stated.

- (ii)
- Total SCR has come out higher on CUM than AAM
 - Need to consider past service position in conjunction with future
 - Expenses and insurance premiums unchanged on either method.
 - CUM SCR has 2 parts: accrual and revaluation. First part is lower than PUM or AAM, but revaluation part can be considerable.
 - Particularly where past service very long when compared to future service could give CUM SCR > PU or AA.
 - Note future service benefits reduced 2 years ago which helps to explain this
 - Mature scheme also narrows gap on future accrual element if average age high.
 - Overall recommended cont. rate would be higher as Standard Fund lower and hence more catching up to be done via past service adjustment, i.e. pay less at start and more later.

Credit was given for any sensible comments that were consistent with the calculations.

6 (i)

Pay as you go

- The contribution income in each year equals the benefit expenditure so no fund is established
- The contribution is likely to vary each year
- And will generally rise as the system matures or the population ages
- A control period could be adopted — using an equalised annual contribution rate covering the expected income over a fixed number of years

General average premium

- The level contribution rate is payable throughout the lifetime of the scheme
- A relatively high initial rate is set compared to the pay as you go method
- The contribution is calculated as the present value of all future benefit expenditure / present value of total salaries of the contributing population in all future years
- The contribution rate is stable and substantial reserves are set up under this method

Terminal Funding

- The contribution income in any period is the amount required to finance the capital of the benefits awarded in the period i.e. benefits are prefunded at the time they are awarded
- Widely used for pension benefits paid from occupational injuries funds

Scaled Premium

- The contribution rate is between the extremes of pay as you go and general average premium
- It is similar to using an equalised pay as you go rate but the fund cannot fall to zero
- A fund will be built up but the scheme will not be fully funded
- It may be complicated to operate

(ii)

- Tax (or other) incentives for the employer e.g. employer contributions deducted from profits before deduction of any corporate tax
- Tax (or other) incentives for the employee e.g. contributions deducted from taxable income
- Tax incentives on investment income (e.g. dividends, rents) and investment growth (realised and unrealised gains)
- Tax incentives on benefit payments (e.g. regular income, lump sums)
- State recommendation / accreditation of certain pension providers
- or certain forms of management of funds (e.g. with maximum charges)
- Providing guarantees to top up investment returns or act as a guarantor if the private scheme fails
- Provision of central administration resources
- or simplifying regulations and advertising private pension provision

- Reduce state pension benefits
- Regulation to enhance the security of pension schemes e.g. funding checks, regular disclosure etc.
- Education as to the benefits of pension provision

(iii)

- Avoids the need to offer other incentives e.g. tax incentives
- Likely to significantly increase the coverage of retirement saving
- So reduces pressure on State provision
- And without it is difficult to ensure some people will make any or an adequate provision for retirement
- Is likely to involve an education campaign that will result in improved understanding of retirement saving
- Should be easily portable from one employer to another
- Investment funds will be delivered at a low cost as a result of economies of scale
- Administration services will be delivered at a low cost as a result of economies of scale
- and should provide members with a greater degree of security as their own funds will be less affected by political change
- Will set a minimum target level of benefits

7

(i)

- PUC rate for active members $[1/50 * (1.07/1.10)^{25} * 15] / .01$
= 15% Pens Sal
- Expected active liability
 $30 * (1.10) + PUC * 8 * 1.07^{1/2} \times 1.10^{1/2}$
= 33.00 + 1.30
= 34.30
- Expected pensioners liability
 $20 * (1.10) - 2 \times (1.05^{0.5}) * (1.10^{0.5})$
= 22.00 – 2.15
= 19.85
- Expected left service liability
 $5 * 1.10$
= 5.50
- Expected contributions
 $0.05 * 8 * (1.07^{0.5}) * (1.10^{0.5})$
= 0.43

- Expected assets
 $60 \times (1.10) + 0.43 - 2 \times (1.05^{0.5}) \times (1.10^{0.5})$
 $= 66.0 + 0.43 - 2.15$
 $= 64.28$
- Expected surplus
 Expected assets – Expected liabilities
 $= 64.28 - 34.30 - 19.85 - 5.50$
 $= 4.64$

Assumptions used:

- Pension increases on average $\frac{1}{2}$ way through the year
- Pension payments on average $\frac{1}{2}$ way through the year
- Contributions on average $\frac{1}{2}$ way through the year
- Salary increases on average $\frac{1}{2}$ way through the year

(ii)

- Salary increases different from that assumed
- Investment return different from that assumed
- Pension increases different from that assumed
- There may have been membership changes, e.g.
 - ..early retirements
 - ..new entrants
 - ..members leaving service
 - ..with or without an entitlement to a deferred benefit
 - ..deaths
 - ..members electing a transfer value
- The average age weighted by salary may be different from that assumed
- There may have been augmentations to benefits, without a corresponding payment into the scheme
- The incidence of payments or increases may have been different from that assumed
- There may have been expenses debited from the scheme which were not anticipated

8

(i)

- Trustees have a duty to ensure sufficient contributions are paid so that scheme benefits can be paid as they fall due and a viable ongoing employer is needed to achieve this
- For an ongoing pension scheme any deficit could be viewed as an unsecured debt on the sponsor
- This deficit will rank alongside other creditors of the sponsor
- If a pension scheme winds up there may be a deficit that will not be paid
- The trustees will need to assess the security of accrued benefits
- and the differing priorities of various categories of members
- To aid setting the general investment strategy

- and in particular how “safe” the backing assets need to be e.g. Government Securities
- To aid setting a prudent valuation basis
- and in particular any adjustment needed to the discount rate to allow for the underlying risks
- To understand how much the employer can actually afford to pay
- and over what reasonable period the contribution schedule should extend
- Relating the employer's ability to pay to their willingness to pay
- Any trust deed & rules requirements
- Assessing the impact of any statutory minimum contributions
- Allows consideration of alternatives to cash payments e.g. charge on company assets
- Assessing trustee demands for earlier payments of contributions to make good any deficits
- Trustee decisions to trigger wind up
- or forcing cessation of future benefit accruals

(ii) **Methods**

- Trustees can adapt a number of conventional credit quality assessment techniques to assess the strength of the employer's covenant — these include;
- Assessment of the sponsor's general business outlook
- and those specific to the sponsor's sector
- Use of financial statistics and accounting ratios from published accounts e.g. interest cover
- and comparisons with similar companies
- and comparisons with previous years figures to determine any trends
- Ask for access to management accounts
- Assessment of the market view if the sponsor has issued equities or corporate bonds
- e.g. excess yield over government bonds or Merton model
- but only a small number of pension schemes will have access to this information
- Independent credit ratings from specialist credit rating agencies giving an assessment of the sponsor defaulting on its financial obligation and its subsequent insolvency
- but again only larger companies tend to have full credit ratings
- Commission an independent business review from an accounting firm or insolvency practitioner

Monitoring the covenant

- Reviewing publicly available financial information on a regular basis e.g. published accounts
- and undertake regular reviews of the sponsor's covenant using qualified professionals

- Discussing the sponsors financial position regularly with the finance director
- Ensuring the sponsor notifies the trustees of any changes in circumstances that could affect business prospects and hence member's security
- Take account of any risk based measures imposed on the sponsor e.g. levies

(iii)

- It may mean that any deficit is financially unmanageable
- The trustees may request the sponsor to make up the deficit more quickly if the scheme's financial position deteriorates
- However difficulties can arise if the employer cannot afford the contributions
- It could be argued a weaker sponsor should be permitted to defer contributions to ensure the company stays in business
- but trustees should request increase to contributions as prospects for employer improve
- Alternatively the pension scheme could arrange to have a charge on certain assets if a specified event occurs
- For example an employer insolvency or failure to achieve a specified funding level
- The charge could be on a property or other assets and be provided by the sponsoring employer or by a third party such as a bank
- Legal and actuarial advice should be considered
- It may enable the trustees to pursue a riskier return seeking investment strategy
- or enable the schedule of contributions to be structured in a way that would otherwise not have been acceptable to the trustees
- The guarantee should only be considered over a short period and reviewed at each valuation

END OF EXAMINERS' REPORT