

**Subject ST4 — Pensions and other Benefits  
Specialist Technical**

**EXAMINERS' REPORT**

**April 2008**

**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.

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Chairman of the Board of Examiners

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## Comments

*Overall the standard was in line with recent sittings but the usual issues arose; namely:*

- *not making enough distinct points given the marks available*
- *not answering the question asked*
- *not knowing/writing down enough of the “bookwork” points*

*Comments on the individual questions are given below.*

- Q1 Generally well attempted, although some candidates limited their answers by not considering all the options.*
- Q2 This was poorly answered, perhaps not surprising given the unusual circumstances. In spite of the clear instruction to design a DB scheme, many candidates wrote about DC schemes. Candidates did not seem to appreciate how important the company's ethos was and it was this that led to its high turnover of staff.*
- Q3 Reasonably well answered but many candidates did not write enough for part (iii).*
- Q4 Those who knew what they were doing scored well here. Others struggled, particularly on part (iii).*
- Q5 It was disappointing that some candidates considered investment risk from a DB perspective.*
- Q6 It was surprising how badly many candidates did on this question as it is a topic that has been examined many times previously. A common mistake was failing to write down enough points therefore losing “easy” marks.*
- Q7 Parts (i) and (ii) were well answered. In parts (iii) candidates concentrated on ways of assessing credit risk and did not cover other issues about the scheme or sponsor. Candidates did not make enough points in part (iv) and (vi) and it was surprising how in part (iv) many concentrated on the savings in death in service premiums rather than the more significant issues. Many candidates did not appreciate that the standard transfer value basis is usually a more optimistic basis than the funding basis and not identical to it.*

*Finally the examiners have noticed a deterioration in the standard of handwriting which makes marking difficult particularly where candidates use shorthand or text speak. It would be appreciated if those candidates where this is a particular issue (you know who you are) made an effort to make their work clearer as we cannot give credit if a solution is illegible.*

# 1

- *Continuation of the scheme without further accrual of benefits*
- Avoids cost of disinvesting / transferring assets
- No guarantee that discontinuance benefits will be met
- ..as available benefits affected by future investment and mortality experience
- Sponsor may not make good any shortfall
- Good experience may only benefit those alive at some future time
- Retains mortality and investment risk
- Still need to meet expenses
  
- *Transfer of the liabilities of the scheme to another scheme of the same sponsor*
- Similar points to *Continuation*
- Need availability of another scheme
- Cross-subsidy as any future surplus / deficit may be spread over larger group of lives
  
- *Transfer of funds to the beneficiary to extinguish the liability*
- Legislation may not permit
- Need controls to ensure that funds used for primary purpose of providing pension / cash benefits at retirement
- ..e.g. requirement to invest funds / transfer to another scheme (e.g. same or new employer) / purchase annuities at retirement
- Ultimate benefits depend on individual experience
- ..and assumptions used to capitalise benefits
  
- *Transfer of the funds to an insurance company to invest and provide a benefit*
- Ultimate benefits depend on individual experience
- No guarantee that discontinuance benefits will be met
- Transfer value may reflect scheme underfunding
  
- *Transfer of the funds to an insurance company to guarantee the benefit*
- May be expensive and require lump sum input by sponsor
- Insurance market may be limited
- Need insurance companies to be regularly monitored to ensure guarantees met
  
- *Transfer of the liability to a central discontinuance fund operated on a national or industry wide basis*
- Central fund needs a way to raise money to ensure guarantees can be met
- ..e.g. by means of levies on other schemes
- May expect a lower benefit level

## 2

- Defined benefit (or at least final salary) gives greater reward for success
- Since the formula gives credit for final earnings which would be higher in a successful career
- As long as all earnings (including variable pay) were recognised in the definition of pensionable pay
- Where employees do not perform, their variable pay is likely to be low at exit which is another reason for including it in the definition of pensionable pay for this company which rewards success but doesn't tolerate failure
- At the extreme, it might be possible to exclude basic pay from the definition entirely!
- Although this would be a very unusual design feature
- There should be no averaging in the definition of pensionable pay to incentivise the employee to perform right through his/her career
- In terms of the accrual rate, this should be better than the sector average in order to help attract talent in to the business. It is usually the thing that potential employees look at first
- It might be possible to link the accrual rate with amount of performance related pay awarded
- So that 'bonus accrual' is offered for very high performance
- But it should be noted that this might then be locked in even if the levels of high performance are temporary
- In relation to voluntary withdrawal, the company will want to encourage this for underperformers and discourage it for high performers
- It might be possible to orient the deferred pension formula around this, so that the design is more generous to those with low performance related pay
- For example, if local legislation permitted, a cap could be applied to the performance related pay element in calculating the deferred pension for a voluntary early leaver
- Considering non-voluntary leavers (and specifically those reaching the end of their fixed term contracts). The design should be structured to reward those who are still performing well at that time
- For example, by offering immediate unreduced retirement benefits (or a transfer payment of equivalent value for those who want to carry on working)
- Death (and other protection) benefits are not generally offered for incentivisation reasons
- And could therefore be excluded from the design entirely
- Although again that would be a relatively unusual design feature
- Considering now member contributions
- There is a risk under the proposed design that these will be paid on very high earnings in some years
- With the prospect of not necessarily receiving any reward for these payments if performance falls towards the end of a career
- This possibility might be demotivating even for high performers

- So it would probably be appropriate to make the scheme non-contributory (or payable on basic pay only)

Credit was given for well argued/revalued career average designs

**3** (i) *Roles state plays*

- Provide benefits to some or all of population
- Educate or require education about the importance of providing for the future
- Regulate to encourage or compel benefit provision by/on behalf of some of the population
- Regulate bodies providing benefits, and those with custody of funds, to attempt to ensure security for promises made, or expectations created

(ii) *Arguments for and against funding*

In favour

- Increases level of savings
- Develops capital markets
- Creates extra investment that stimulates growth
- Eases the pressure of an ageing population
- Investment returns reduce the long-term cost of benefits

Against

- Overall saving may not rise, just be redirected
- Even if overall saving rises, it may not create real investment
- Does not solve the problem of an ageing population
- Transition to funding may be problematic
- Fund may prove a political temptation
- Doesn't add to security, as government can always raise revenue via taxation or borrowing

(iii) *Using Taxation to Encourage Provision*

- Provide financial incentive via beneficial tax terms
- Either full or partial relief
- Provided to provider of benefit, recipient, or both
- On contributions
  - Employer contributions deducted from profits before corporation tax
  - Employer contributions not classed as taxable income for employee
  - Employee contributions deducted from taxable income
  - Contributions subject to lower level of tax than profits / income
- On investments
  - Investment income not subject to tax
  - Investment growth not subject to tax
  - Income or growth subject to lower levels of tax
- Benefits
  - Regular income not subject to tax
  - Lump sum benefits not subject to tax
  - Benefits subject to lower level of tax than earned income
- “Exempt, Exempt, Taxed” is common (for conts, investments and benefits)
- May be upper limits on contributions and / or benefits

- 4** (i) The standard contribution is found by dividing the present value of all benefits which will accrue to active members after the valuation date,
- by reference to service after the valuation date
  - and projected final earnings,
  - by the present value of total projected earnings for all active members throughout their expected future membership.
  - The actuarial liability is the present value of all benefits accrued at the valuation date based on projected final earnings
  - Standard contribution rate =  $480 / (180 \div 5\%) = 13.3\%$
  - Actuarial liability =  $170 + 380 = 550$  million units
- (ii)  $PUC = AA \times (a \ 10 / 10) \times (1 / a \ 1)$  where  $i = (1.06 / 1.04 - 1)$
- $$13.3 \times (9.0188 / 10) \times (1 / 0.9811) = 12.2\%$$

- (iii) Accrual element – allow for revaluation of deferred benefits at 3% p.a. rather than salary increases at 4% p.a. (Methods using 0% revaluation were also accepted)

$$12.2\% \times (1.03 / 1.04)^9 = 11.2\%$$

The actives liability fund allowing for revaluation of deferred benefits at 3% p.a. rather than salary increases at 4% p.a.

$$= 380 (1.03 / 1.04)^{10}$$

$$= \text{£}345 \text{ m}$$

Allowing for salary increases in the 1 year control period

$$= 345 \times ((1.04 / 1.03) - 1) = \text{£}3.35\text{m}$$

Expressed as a percentage of pay

$$3.35 / (1\% \times (20 \div 5\%))$$

$$= 0.8\%$$

Total CUM rate

$$11.2\% + 0.8\%$$

$$= 12.0\%$$

## 5 Administration

### *Risks*

- Record keeping and administration may not be robust
- Leading to incorrect or late payment of benefits
- Late or incorrect payments of contributions may breach local legislation
- Resulting in lost investment return
- And hence overall poor reputational risk for the sponsor
- Fraud

### *Mitigation*

- Establish service level agreements with providers
- Establish robust internal controls e.g. risk management / monitoring processes
- And clear line of communication amongst all parties to ensure accurate and timely
- record keeping
- Setting a clear timetable for receipt and investment of contributions

### **Investment**

#### *Risks*

- Poor selection and review of investment managers
- Poor performance of assets
- Inappropriate availability of investment funds
- For existing and anticipated scheme membership
- Members are poorly equipped to make appropriate fund selection
- Market conditions giving higher than expected annuity prices at retirement
- Pressure on sponsor to make good shortfalls

#### *Mitigation*

- Take professional advice
- Establish rigorous process to select investment managers
- Review managers on a regular basis
- Similarly select funds for existing / anticipated membership
- Review appropriateness regularly
- Educate / offer guidance to members on fund selection
- Offer “lifestyling” or default option

### **Charges**

#### *Risks*

- Unduly high charges
- That reduce members benefits
- Or increase employer costs
- Fixed costs may be high relative to the fund size



*Mitigation*

- Consider charges at setup and at regular period to ensure value for money
- Issue clear / simple information about costs
- Demonstrating how they affect the scheme and members' returns
- Limit number of switches of fund

**Member understanding**

*Risks*

- Members make poor decisions on investment or retirement choices
- Complaints from members about benefits in retirement
- Members don't understand and therefore do not value the pension provision provided

*Mitigation*

- Ensure members are aware of the design and types of annuities available at retirement
- And understand the alternative retirement options available to them
- Ensure members appreciate the differences between any investment options available to them.
- Including open market options etc.
- Provide members with clear and timely information to ensure they have sufficient understanding to make informed decisions (make member benefit statements available)

**6**

(i)

- The liability structure may have changed significantly. For example:
  - following a takeover or sale where the membership profile has changed significantly
  - or recent benefit changes such as removing the final salary link and giving all active members leaving service benefits
  - or benefit improvements
  - or legislative changes such as providing guaranteed pension increases for all service, equalisation etc.
- The funding position may have changed significantly.
- For example, surplus may have disappeared or deficit increased following a fall in the stock market, higher than expected salary increases etc.
- The investment manager may have significantly underperformed relative to its performance objective.

- For example, the manager has changed its style, staff movements, adopting too much risk.
- Also need to consider whether any Scheme events have impacted on the manager's performance e.g. a large disinvestment at short notice which adversely impacted the manager's performance relative to its performance target.
- Employer covenant may have strengthened (allowing more risk to be taken) or weakened (allowing less risk to be taken).

(ii)

- The liability profile:
  - nature (proportion of fixed or real liabilities) and term (short/long related to maturity of the scheme)
- The funding position:
  - is the scheme in surplus allowing greater investment freedom or is the scheme in deficit.
- The size of the fund:
  - whether it is increasing, static or decreasing related to maturity of the scheme, whether it is open/closed to new entrants and future accrual.
- The expected cash flow & liquidity requirements.
- Current strategy and expected costs of revising.
- Trustee and sponsors attitude to risk
- The strength of the employer covenant and its long term commitment to funding the pension scheme.
- Requirements of any trust deed & rules.
- Any legislative or taxation constraints.

(iii)

- The purpose of the ALM is to project future asset and liability cash flows using stochastic and deterministic methods to obtain a range of likely outcomes in order.
- to help in assessing the risk (i.e. probability of shortfalls) and rewards (i.e. probability of surpluses) of holding different investment strategies.

(iv) Four different measures of risk must be given to get full marks. For example:

- The probability that the Employer contribution rate rises above  $x\%$  over the next 10 years is less than 5%.
- The probability that the ongoing funding level falls below 75% over the next 10 years is less than 5%.

- The investment strategy required to achieve an ongoing funding level of 100% over the next 10 years with 90% probability.
- The probability of exceeding 120% funding level on an accounting basis over the next 10 years is less than 5%

(v)

- Trustees' objectives.
- Time period for the projections.
- Funding method, funding assumptions and results (funding level and future contributions) from the actuarial valuation
- Full membership data, asset information required for the actuarial valuation
- Details of terms of any options (e.g. cash commutation, early retirement, transfer values) and guarantees as the timing of the cash flows is important in an ALM.
- Number of simulations to be run – in order to obtain reliable statistical estimates c10,000 simulations will usually be necessary.
- Economic model needed to project cash flows e.g. random walk, wilkie model
- Parameters for the model – expected returns and standard deviations of return on each asset class, the degree of correlation between different parameters e.g. equity returns and price inflation,
- Initial best estimate assumption for the model – both financial and demographic e.g. withdrawal, mortality, early retirements and proportions assumed to exercise options.
- These may differ from the funding assumptions which contain margins for prudence.

(vi) **Results**

- Statistics on the distribution (typically expressed as mean, standard deviation, lower and upper quartiles) of possible future valuation results at the end of the projection period for different investment strategies.
- The valuation results can be expressed in different ways e.g. funding level or contribution rate on different bases – ongoing, solvency, accounting.
- A range of sensible investment strategies for a particular set of investment return and risk assumptions often called an “efficient frontier”.
- Statistics on the distribution of the future net (benefit outgo less contributions and investment income) cash flows for each year over the projection period to assess the likelihood of having to realise assets possibly on unfavourable terms.

- The results above on alternative sets of assumptions to model the sensitivity of the results to different assumptions and economic conditions e.g. boom market, deflationary conditions etc.
- The ALM can identify the extreme results that fall within the tails of the statistic distribution e.g. the top and bottom 5% of an event happening. The trustees need to consider the implications if such an event happened and whether any insurance (e.g. derivatives) needs to be put in place to protect the Scheme if this happened.

### ***Use of Results***

- The range of possible investment policies is theoretically infinite hence a subset of optimal or sensible policies is determined from the model.
- These results need to be tested for robustness under alternative assumptions (sensitivity analysis).
- Following the sensitivity analysis, it is usually possible to identify a small number e.g. 3 investment strategies that appear sensible under most reasonable sets of assumptions.

### ***Limitations***

- The ALM is only a tool and is highly dependant on the model, data and assumptions used.
- Therefore the investment strategies derived from the ALM policies should not be regarded as optimal other than in the context of the model.
- The ALM does not allow for external influences such as legislative changes, medical advances which further improve life expectancy.
- May produce impractical answers such as 100% property which is not appropriate given the availability in the market, fund size etc.

## **7** (i) *Sponsor covenant not important if:*

- Scheme very well funded
- Sponsor covenant strong enough to be deemed as certain
- Sponsor covenant so weak as to be deemed as nil
- Sponsor has no further liability

## (ii) *Viable ongoing / In distress*

### *Viable ongoing*

- Deficit is financially manageable
- Reasonable likelihood of it being paid off
- Over an appropriate period

In distress

- Deficit financially unmanageable given sponsor's resources
- No realistic likelihood of removing deficit over appropriate period

(iii) *Determining status of sponsor*

- No specific measures to distinguish between the two.
- Trustees need to decide...
- ...seeking advice from actuaries on nature of liabilities and
- ...credit risk specialists on the sponsor's finances

About the scheme

- Size of liabilities (is the scheme 50% or 90% funded?)
- Ongoing cost of accrual or current contributions (is £50m one year's accrual or 10 years?)
- Reason for deficit arising
- Prudence of assumptions
- Liability on other measures
- Nature and term of liabilities...
- ... in particular, how long is appropriate period to restore funding
- Investment strategy....
- ... in particular, degree to which assets match liabilities

About the sponsor

- Need to assess its ability and willingness to pay sufficient contributions
- To meet benefit payments as they fall due
- £50m could be regarded as loan to sponsor
- Consider size of deficit relative to size of employer
- ... its assets (which could be realised to repay the "loan" if required)
- ... its earnings (which can be used to meet regular "repayments" to the scheme)
- Extent to which it is legally obliged to fund the deficit (if any)
- Particularly if scheme were discontinued
- Consider other company debt (how much / ranking of scheme)
- Consider if parent company who would make good any shortfall
- Various ways to assess credit risk (i.e. ability to pay), e.g.
  - Business outlook
  - Financial metrics
  - Implied market default risk

- Credit ratings
- Other risk-based measures e.g. levies
- Probability of default using Merton-type model
- Independent business review
- Assess willingness to pay by considering
  - Past practice if deficits have arisen before
  - FD's attitude / plans

(iv)

- Need to consider the terms offered on early retirement
- They may not be actuarially neutral and result in actuarial profits for the Scheme on early retirement in which case sponsor would look to encourage early retirement
- They may exclude discretionary benefits
- As the form of the benefit alters on early retirement (i.e. lower pension paid for a longer period) there is a reduction in the investment and longevity risk
- The Scheme may be able to 'buy out' the pension with an insurance company on competitive terms
- hence reducing future risk (and possibly cost)
- Part of the early retirement pension may be commuted for cash
- The commutation terms may be less generous than the cost of the pension again resulting in an actuarial profit
- This commuted pension then has no longevity or investment risk for the scheme
- Reduction in future accrual
- Is it allowed under the TD&R/legislation?

(v)

- A full communication exercise is essential to ensure informed member consent
- e.g. members appreciating that in a high inflation environment this might not be the best option for them
- If this is done on a cost neutral basis there is no financial impact
- but the longevity risk is reduced
- and arguably there is a lower investment risk
- Effectively the option is a transfer of the inflation risk (above an assumed level) from the scheme to the member

- Selection issues as option likely to be more attractive to those in ill health

(vi) *Advantages*

- The risks attributable to the transferring members are removed
- These include investment and longevity risk
- The transfer value offered may be lower than the amounts reserved for funding
- Or on the accounting basis
- hence the Scheme funding level will improve
- It is very likely that the enhanced transfer value will be lower than the cost of “buying out” the benefits with an insurance company
- There may be administrative savings over the long term

*Disadvantages*

- There would be cashflow implications as significant amounts of cash may be needed immediately to pay the transfer values
- There may be future complaints / compensation claims if eventually the member loses out from investment & mortality experience
- The complaints may impact on the reputation of the Company
- May be perceived as “Mis- selling” with increased sales pressure from the limited time period for the member to make a decision
- Selection issues – 10% enhancement may be attractive to certain subgroups of membership
- Informed member consent may be needed – the cost of this will borne by the Company
- and the actual take up rate may be low
- Costs of exercise may outweigh any savings
- Potential for conflict between Trustees and the employer
- The 10% enhancement will reduce / eliminate the actuarial profits for the Company
- Possible involvement from any Pensions Regulators

## **END OF EXAMINERS' REPORT**