EXAMINATIONS

September 1997

Subject H — Pensions

Paper Two

EXAMINERS' REPORT

COMMENTS ON ANSWERS

Question 1

Most candidates explained the basic differences between money purchase and final salary. Few appreciated the problem with setting a money purchase contribution "which will be sufficient to replicate the benefits provided" in all circumstances. Better candidates recognised that assumptions may not be those used for funding.

Question 2

Reasons for a valuation were well rehearsed. The lack of margins in the proposed basis were identified. Very few candidates made the point that the current level of funding and the extent to which benefits are guaranteed needs to be considered.

Question 3

Lists of data were usually fairly complete. Better candidates opted to give pessimistic and optimistic results to illustrate range of possible outcomes.

Question 4

A surprisingly small number of candidates recognised that the data list went beyond the "standard" to include details of the executives' bonus. Most candidates recommended a projected unit or attained age method (or a combination of the two). Few discussed the possibility of funding for executive benefits at the most expensive retirement age.

Question 5

Few candidates listed assumptions. A variety of approaches was taken to the calculations and credit given for reasonable approaches which differed from the solution. The main problem for candidates was dealing with the withdrawal decrement.

1 The following points are relevant for inclusion in an answer to the Finance Director. They should be set out in a well structured report or letter format to the Finance Director which is clear, uses non-technical language and is not patronising.

Target Benefits

If a contribution rate is determined to fund a particular benefit eg normal retirement pension, this may produce an inappropriate rate to fund another benefit, for example an early retirement pension or leaving service benefit.

A decision will be needed on which benefits were the most appropriate to target.

An average rate could be used,
but this would quite possibly ensure that no benefits were adequately targeted.

It is likely that whatever contribution structure is taken for retirement/ leaving service benefits, alternative arrangements will be needed for death in service and ill health benefits.

These would probably need insurance,
which would lead to variation in cost.

The actual benefits will depend on the individual experience of the member.

Assumptions

The actuarial basis used to assess the money purchase contributions needs to be set.

Typically the assumptions adopted for the final salary scheme will include margins,
will be appropriate for a group
and may fund for discretionary benefits.

If the same assumptions are used for determining the money purchase contribution rate, the likely outcome is that the money purchase benefit will be different (either higher or lower) from the defined benefit.

Specific examples include:

- Investment return

  If the investment return is not a best estimate, presumably more conservative, the money purchase account will on average accumulate to a greater sum than is needed to provide the defined benefit.

- Salaries

  The actual salary progression of the individual member is likely to be different from an average assumption; therefore the ultimate benefit will differ.

- Pension increases (and other discretionary benefits)

  If guaranteed benefits only are valued the member effectively loses the opportunity to receive discretionary benefits.

  The company could provide an allowance for a discretionary benefit at retirement, but would need to fund it specifically at that time.

  If discretionary benefits are included they become guaranteed.

Administration

- Each member will require an individual calculation at joining.
- This will be relatively cumbersome,
- and will produce a different contribution rate depending on age, profile etc.
- Overall costs will therefore be dependent on the make up of the population, and this could still vary over time.

Communication

- What benefits do you actually promise to the member?
- It will be difficult for members to compare benefits with their peers or with the market.

Investments

- The assumptions will need to reflect a particular investment profile.

  If individuals are given a choice they may choose investments with a different profile from that assumed

- If they choose capital secure investments (eg cash) the likely level of investment return will be somewhat lower than anticipated;
- also, as the member approaches retirement the account will be vulnerable to changes in the cost of securing pensions with an insurance company.

- Lifestyle investments can reduce but not eliminate this uncertainty
- and therefore benefits will be correspondingly lower.

Additional marks available:

Ongoing administration will be more onerous/expensive

Sensible comments around industrial relations or competitor issues

2 (i) To calculate ongoing funding level of benefits for service to date.

To calculate solvency based on cash equivalents.

To calculate solvency based on cost of buying out benefits.

To calculate minimum funding requirement level and schedule of contributions.

To assess whether Certificate A for purposes of contracting-out can be signed.

To calculate the company's ongoing contribution rate, in order to sign disclosure of information certificate

To assess statutory surplus position.

To provide accounting information.

Likely to be a requirement of the Trust Deed and is a statutory requirement anyway.

(ii) The basis proposed by the company is close to a best estimate basis, in that it contains very few margins against adverse experience.

It is difficult to say whether the proposal is reasonable or not without further information.

Taking each element in turn:

- Investments
  - Depends on the investment strategy,
  - and the underlying inflation assumption.
  - Assuming a substantially equity based investment strategy, equities net of expenses have historically provided returns around 6% per annum higher than price inflation.

- With price inflation of 4.5%, could assume investment return of 10.5% as suggested.

- This is based on the historic relationship between investments and prices and contains no margins.

- Salaries

  - Historically salaries have increased by around 1½% - 2% per annum more than price inflation.

  - The proposal therefore is for salaries around national average earnings level.

  - Trustees need to be satisfied that this is appropriate for this scheme.

  - This element of the proposed basis, relative to prices, is effectively no different from that used at 1 April 1994.

- Pension Increases

  - It is important to look at the level of pension increases relative to price inflation.

  - In both bases the allowance for increases is 0.5% lower than prices which represents a similar level of inflation protection.

  - The trustees should check the level is appropriate against what is guaranteed and potential discretionary increases.

- Asset Valuation

  - The use of a best estimate with investment return is consistent with the use of market value for the assessment of assets.

  - a market value approach will lead to volatility in results from one valuation to the next

  - The approach used in the 1 April 1994 valuation has the effect of smoothing the value of assets.

  - The assumed level of dividend growth equal to 0.5% pa lower than price inflation is lower than indicated by historic data. The approach therefore tends to understate the long term value of assets and hence provides a margin.

Overall, the basis proposed contains few margins.

The trustees have a duty to ensure that benefits are appropriately financed.

In particular the level of contribution needs to be at least as good as required to meet the Minimum Funding Requirement.

In addition, the trustees are likely to wish to ensure there is sufficient to provide regular leaving service cash equivalent benefits (if these are at a higher level than MFR) and the cost of securing pensioners with an insurance company.

The trustees' response will be influenced by the current level of funding, (ie surplus) in the scheme,
and also the extent to which the benefits being valued are guaranteed or discretionary;
for example, if pension increases for service prior to April 1997 are not guaranteed, an assumption of close to price inflation represents a substantial margin over guaranteed benefits.

This may be sufficient to justify an underlying investment return assumption which is relatively aggressive.

Depends on the investment strategy or liability profile.

(iii) SSAP24 aims to set out guidance so that accounts give a true and fair view of an employer's commitment to a defined benefit promise.

These include:

- recognising the realistic cost of accruing benefits;
- avoiding distortions resulting from fluctuations in the flow of contributions from the employer to the scheme;
- providing consistency in the accounting treatment from one year to the next;

- requiring the disclosure of appropriate information.

Responsibility for the assumptions rests with the actuary in consultation with the company.

SSAP24 requires the assumptions and method overall to represent a best estimate of future experience explicitly including allowance for salary increases and increases to deferred pensions and pensions in payment.

It is therefore important to establish with the company that each of the assumptions listed when taken in conjunction satisfy this statement.

If investments are substantially equity based the investment return assumption of 10.5% is probably appropriate in isolation.

The appropriateness of the salary assumption will depend on the likely level of future salary increases.

If these are to be in line with national average earnings the assumption may be appropriate.

Pension increases should reflect the anticipated level of future such increases,
regardless of whether these are guaranteed or discretionary;
again it should be established with the client whether the level allowed for is appropriate.

In commenting on the SSAP24 basis need to look at demographic assumptions in order to state if or if not acceptable.

3 (i) Date of birth
Current fund value
Charging structure of personal pension policy
Current charges - £ pa
- % fund
Potential charge increases
Conditions applying at retirement - charges on annuity purchase
- rates basis (if available)
Current salary
How is the managed fund invested?
What is the current contribution rate?
Does he have any protected rights funds?

Additional marks available:

Sensible comment around salary data requirements; e.g. review date or need to collect non basic pay details

(ii) Investment return before retirement

- need to look at relatively short term prospects for the economy (retiring in 5 years)
- take account of fund management charges (if % of fund)
- assume a move out of equities and into index linked gilts / cash

Investment return after retirement

- Mr J intends to purchase an annuity at retirement so need to estimate the return to be used by life offices

- RPI pension is wanted so real returns used are relevant

Salary growth

- discuss with Mr J, taking account of general economic assumptions

Inflation

- need to look at relatively short term prospects for the economy
- economic assumptions need to be consistent with each other

Expenses

- look at annual charges made by life office and potential increases pre retirement
- consider the charges made by life offices for annuities

Mortality

- pre retirement - assume he survives
- post retirement - estimate of assumptions used by life offices

Commutation

- ¼ of fund

Survivors' benefits - <u>none unless contracted out</u>

(iii) (Possibly) Asset liability modelling exercise

Stochastic investment model to test if selected contribution rate likely to result in the desired level of benefits

(More likely) Carry out a few projections using a fairly basic approach

Illustrate what happens if experience does not match assumptions

Illustrate various scenarios

Illustrate how investment values can move in a different way to annuity rates

Explain how investments could be moved into "safer" funds as retirement approaches

Explain trade off between higher investment returns and volatility of fund value relative to annuity values

If earnings cap will have an impact explain the effect

4 (i) Data/info:

Trust deed & rules
Amendments/announcements
Scheme booklet
Minutes (e.g. otherwise undocumented changes to rules)
Details of arrangements for individuals
Annual accounts as at valuation date
Details of invested assets
Basis used by previous actuary to determine early retirement benefits

Actives and deferreds

- Member identifier
- Age
- Sex

Actives only

- Current basic
- Date joined scheme
- Indicator for executive members

Deferreds only

- Date of leaving
- Deferred pension at date of leaving

Pensioners

- There are none

Executive members only

- History of gross pay previous 13 years
- Date joined company
- Information from company as to intentions regarding early retirement of executive members
- Retained benefits

Additional marks available:

Previous valuation report

Annual acounts <u>in the three years</u> to the valuation date

Actives - transfer in detail

Pensioners - there are none but may collect details if, for example, pension increases are to be costed.

(ii) Method of funding

The funding basis needs to include an allowance for the cost of buying out annuities i.e. a lower discount rate

Staff members

- Any reasonable e.g. projected unit
- Justification - expect membership salary/sex profile by age to remain constant because of replacement new entrants

Executive members

- Ignoring bonuses, the early retirement benefit would be based on the N/NS formula
- However, the bonuses may mean that the full 2/3rds x basic can be paid
- This is complicated and may result in there being a significant option in favour of members leaving early
- Hence, for past service the actuary needs to consider the worst case and fund on this basis (e.g. attained age selecting on retirement age the age which gives the highest past service liability)
- The past service liability should be subject to a minimum of the buy out cost assuming immediate early retirement for each executive member

General

The option to retire at any time means investment policy should be constrained. Hence, depending on the degree of constraint required, the allowance for investment return would be adjusted downwards accordingly

(iii) Advantages of buying annuities

- The terms may be "profitable"
- The executive members constitute an enormous share of the liabilities hence the scheme would be easier to manage if they are bought out on retirement.

- Save on cost of administration of pension payroll in scheme

- No mortality, investment or expense risk

Disadvantages of buying annuities

- Profit (and contingency) margin go to insurance company

- The terms are volatile (i.e. the scheme may be forced to buy on poor terms)

- Investment policy is more constrained

- There may have to be a substantial disinvestment when an executive member retires (i.e. cost of realising assets)

- Discretionary increases would be more awkward

- Possible loss of contact with former employees/less personal

(iv) Constraints on investment policy

A higher proportion of liquid/marketable assets should be held (to cover cash call on retirement which is unpredictable)

Some matching is likely to be required - the degree will depend on the funding level.

The higher the surplus, the less account needs to be taken of matching

Appropriate matching assets are conventional gilts with matching discounted mean term

However, there is likely to be a cash option (which is likely to be exercised) so not all pension should be matched by gilts

Net cash flow - positive or negative?

5 Assumptions

Incidence of pay increases (e.g. continuous, mid year or other reasonable)

Proportions married (e.g. 100% or any other which does not affect results materially)

Spouse age (e.g. male - female = 3 or other not affecting results materially)

No guarantee (or other not affecting result materially)

For simplicity assume all male.

Calculations - actives

Age Probability of exit by withdrawal or not before age 65 × increases

37 $6\% \times 1.07^{½} \times 1.05^{65-38}$ (excluding ½ year because statutory revaluation is for complete years)

38 $6\% \times (1-6\%) \times 1.07^{1½} \times 1.05^{65-38-1}$

39 $6\% \times (1-6\%)^2 \times 1.07^{2½} \times 1.05^{65-38-2}$

etc.

44 $6\% \times (1-6\%)^7 \times 1.07^{7½} \times 1.05^{65-38-7}$

45+ $(1-6\%)^8 \times 1.07^{65-37}$

i.e. Ongoing expected increases =

$$6\% \times 1.07^{½} \times 1.05^{65-38} \times \frac{1-(1.07 \times 1.05^{-1} \times 0.94)^8}{1-(1.07 \times 1.05^{-1} \times 0.94)}$$

$$+ 0.94^8 \times 1.07^{65-37}$$

= 1.6022 + 4.0529

= 5.655

Ongoing expected increases discounted

= $5.655 / 1.095^{65-37}$

= 0.4455

Ongoing annuity (net 4%, 50% spouses, a(55) ult male age 65, spouse 62)

(Annuity is net 4% because 1.095/1.0525 = 1.04.)

= 9.791 + 50% × 100% × (12.590 – (8.641 + 8.141)/2)

= 11.891

(May add 0.5 to convert to continuous annuity.)

Discontinuance expected increases discounted

$= 1.03^{-(65-37)}$

$= 0.4371$

Discontinuance annuity (net 6%, 50% spouses, a(55) ult male age 63, spouse 60)

$= 9.009 + 50\% \times 100\% \times (10.996 - (8.145 + 7.753)/2)$

$= 10.533$

(May add 0.5 to convert to continuous annuity.)

Hence actives discontinuance (including expenses)

$$= £2.6\text{m} \times \frac{(0.4371)}{(0.4455)} \times \frac{(10.533)}{(11.891)} \times 110\%$$

$= £2.6\text{m} \times 0.9811 \times 0.8858 \times 1.1$

$= £2.5$ million

Calculations - deferreds

Ongoing expected increases discounted

$$= \frac{(1.05)^{65-43}}{(1.095)^{65-43}}$$

$= 0.3972$

Discontinuance expected increases discounted

$= 1.03^{-(65-43)}$

$= 0.5219$

Hence deferreds discontinuance (including expenses)

$$= £0.7\text{m} \times \frac{(0.5219)}{(0.3972)} \times \frac{(10.533)}{(11.891)} \times 110\%$$

$= £0.7\text{m} \times 1.314 \times 0.8858 \times 1.1$

$= £0.9$ million

i.e. total estimated discontinuance liability

= £3.4 million