Faculty of Actuaries **Institute of Actuaries**

REPORT OF THE BOARD OF EXAMINERS ON THE EXAMINATIONS HELD IN

April 2002

Subject 404 — UK Fellowship Pensions

Paper Two

Introduction

The attached subject report has been written by the Principal Examiner with the aim of helping candidates. The examiners are mindful that a number of interpretations may be drawn from the syllabus and Core Reading. 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.

The report does not attempt to offer a specimen solution for each question — that is, a solution that a well prepared candidate might have produced in the time allowed. For most questions substantially more detail is given than would normally be necessary to obtain a clear pass. There can also be valid alternatives which would gain equal marks.

K Forman
Chairman of the Board of Examiners

25 June 2002

Question 1

(i) Most candidates scored well, but few got the maximum, generally because they did not state all the assumptions that they were making. Some correct solutions were rather over-engineered for the 9 marks available. Typical mistakes included ignoring pension outgo when projecting the pensioner liability ignoring 2 years' extra accrual when switching the active liability rolling up the accrued active liability at the net (i-e) discount rate rather than the gross (i).
"Wrong" answers were generally close enough to the correct answer for candidates to be able to answer the rest of the question in the way that was intended.

(ii) Most got the numerical calculation correct, but few candidates stated the assumptions implicit in their calculations. The most common mistake was to just multiply the result from the first part (£215.5m) by 90%.

(iii) It was telling that many candidates referred to the "suitability of the valuation basis" in their answers when the question referred to the "suitability of the valuation results".
Most candidates suggested that the mortality was out of date, the discount rate looked a little high, perhaps the allowance for commutation needs looking at, and PUC might not be appropriate for a closed scheme. Accounting standards were often mentioned, but only briefly, and generally no attempt to indicate that the liabilities would likely be significantly higher. Few candidates, however, looked at the whole approach to valuing the scheme, or picked up on the reference to the employer contributing "amounts recommended by the actuary to maintain solvency". "Risk" was rarely mentioned in candidate's answers. A couple of candidates thought the basis was a little strong, overall.

Similarly, few candidates included any attempt to quantify (or "assess") the financial implications of the deal. Candidates' answers to the pros & cons / alternatives of the pension plan staying with target were often muddled, but most picked out the key advantages, and the need to negotiate for a reduced purchase price. Most candidates scored well on the further information that should be sought, although many candidates' lists included the Scheme Booklet and last Valuation Report, items already in possession.

(iv) Most candidates flagged the possible conflict of interest, but then went on to just list the contents of GN29 and the information needed on accepting a Scheme Actuary appointment. Few candidates explained that the Trustees appoint their own advisers, and that XYZ is unlikely to be able to impose you on them. Even fewer identified that the first thing you would need to do is tell the Trustees what you have advised XYZ regarding the poor funding situation on a realistic basis.

Question 2

(i) Generally answered well. Some candidates included detail here that was appropriate to later sections of the question or included reasons why an employer would wish to offer flex - credit was given.

(ii) Candidates struggled with this, often including benefits that they then said were also suitable as core benefits

(iii) Most candidates scored the maximum marks available.

(iv) Generally answered well. Some candidates, however, included the same examples as they had for core benefits, without a convincing argument for why they might be non-core in different circumstances.

(v) Most candidates mentioned selection, but some focused on this issue too much, missing out on issues like cross-subsidies, maintaining the value of the overall package, how often the prices can be reviewed etc.

(vi) Few candidates explicitly mentioned the funding principles for a final salary scheme. Those that did had a ready made structure for their answers and scored well. Most identified that the current surplus would distort things, without discussing in detail what might happen when the surplus is gone. Other issues that candidates did pick up on generally were the prudence of the funding basis, and the cross-subsidies involved if one rate is used for all members.

(vii) Most candidates mentioned age-related rates, various DB accrual rates and DC. Few appeared to use the points they had included in other parts of the question to suggest other solutions (e.g. stripping out margins in the basis, annual rate reviews).

(viii) It's probably down to time pressure in a lot of cases, but this part generally wasn't well answered, even though it drew on themes already identified throughout the question.

1 (i) Additional assumptions:

No retirements from active status because they all retired in 1999
No retirements from deferred status
No transfers in or out
Expenses not paid out of the fund
No contributions paid, as recommended
So only non-investment cashflow is pensions in payment
No new active members because of recruitment freeze
No Active members withdraw, so can assume that PV for year 2 is the same as for year 1 in £s
Because for closed population, PUC cost rises by $(1 + i)/(1 + e)$ in % of salary terms,
Ignoring increases, pension payroll would fall by approx 2% a year (force of mortality approx 4% at 70, but spouse's pensions payable)

Cashflow for 2000–01 = 11.0 * (1 – 2%/2) = 10.89
Cashflow for 2001–02 = 10.89 * 1.025 * (1 – 2%) = 10.94
Assets = $205.0 * 1.08^2 – 10.89 * 1.08^{1.5} – 10.94 * 1.08^{0.5}$ = 215.52
Pensioner liability now = $106.5 * 1.08^2 – 10.89 * 1.08^{1.5} – 10.94 * 1.08^{0.5}$ = 100.63
Deferred liability now = $23.6 * 1.08^2$ = 27.53
Active liability now = $(23.2 + 2 * 2.1) * 1.08^2$ = 31.96

Total liability = 100.63 + 27.53 + 31.96 = 160.12
Funding level = 215.52 / 160.12 = 134.6%

(ii) Assume no change to investment policy
And the investment return has been uniform over the period
And the fund's return has equalled the index return
Assets = $205.0 * 0.90 - 10.89 * 0.9^{0.75} - 10.94 * 0.9^{0.25} = 163.78$
Funding level = 163.78 / 160.12 = 102.3%

(iii) Results

ABC supplied booklet and valuation report.
Using the valuation assumptions/method, the funding level was 134% as at 1 July 2000
On the same basis,
it is now estimated as 102%
This figure is obtained by projecting the valuation results forward assuming all in line with valuation assumptions,
except that investment returns are taken to be in line with the underlying index which fell by 10% over the period.
Ignoring the investment loss, the funding level would have been 135%

Suitability of valuation results

Valuation basis may be a "best estimate" allowing for expected long-term investment returns
But mortality assumption looks out of date
Unless it can be justified by the plan's demographic experience
So the valuation ignores the costs from improving life expectancies
And valuation basis ignores the fact that commutation factors are arguably much less than value of pension
The actuary may decide to change them at any time and so increase the value of benefits
And the company has no control over this
So trustees/actuary may decide to change the basis soon, especially in view of the lower funding level
But also need to look at accounting implications
Under FAS87 because XYZ will have to consolidate
And FRS17 because that may affect Target's ability to remit dividends to XYZ
In both cases, liabilities measured using discount rate derived from corporate bond yields.
More fundamentally, the valuation basis ignores the cost to XYZ/Target of volatility in funding level and contribution requirements
Because the booklet commits the company to maintain the solvency of the plan, whatever that means
The actuary may frame his funding advice accordingly
And/or the trustees may want to focus on the solvency position,
Especially if they are concerned about the parent company's commitment to meet any deficit in adverse circumstances
And because there may be other legislation (instead of MFR) setting out minimum contribution rates,

So the company may find that its contribution requirements increase unexpectedly

Also, plan is very mature, cashflow is negative, so short term matters more than long term

Risk of adverse experience is very significant to Target:

Investment loss in 2 years > annual salary roll

The risks can be reduced by investing in bonds for more certain returns

So it is reasonable to take the liabilities into account using a lower discount rate that does not anticipate the outperformance expected from equities

And the risks can be substantially eliminated by buying out accrued rights

So it is reasonable to look at the insurance buyout position

<u>Assessment of financials</u>

The valuation basis figures suggest that the plan is neutrally funded

(Significant deterioration since 2000 because of adverse investment returns and contribution holiday)

And that the service cost is £2.5 million

Assuming that salaries have grown at 4% as assumed

But this is probably not appropriate measure for XYZ as argued above

So look first at the position on a fair value accounting basis

If you valued the liabilities on a discount rate of say 6.0% (high quality corporate bond),

Pensioner liabilities might rise by around 20%,

And actives/deferreds by around 60%,

Overall increasing the assessed value of past service liabilities by around £50-£60 million

And increasing the annual service cost by around £1.5 million

Using the 92 series of mortality tables suitably projected,

All liabilities might rise by around 10%,

i.e. £20 million onto the past service liabilities and £0.5 million onto the annual service cost

And consider the effect of changing commutation factors, e.g. to be cost-neutral on the valuation basis,

Active/deferred liabilities might rise by around 10%,

i.e. £10 million onto the past service liabilities and £0.5 million onto the annual service cost

Overall, this would mean a past service deficit of approx £80 million

And a service cost of £5 million,

Although this would be offset for accounting purposes in P&L by anticipated investment gain

Also look at the position on buyout basis

This might mean an effective discount rate of 5% (primarily gilts)

And an allowance for expenses

Although no allowance would be needed for salary growth

So perhaps increase liabilities by another £30 million

These figures attempt to quantify the pension risk that ABC is passing to XYZ

And the ongoing cost of the plan
XYZ needs to take these into account in negotiating the price of the deal

Note that the figures are only estimates intended to give order of magnitude

<u>Pros/cons of pension plan staying with Target</u>

Pros

Target can continue its pension arrangements without disruption at time of sale.
Continuity particularly important for employees who may be unsettled by the deal.
No worries about TUPE compliance
Avoids cost/hassle of designing/establishing/implementing alternative arrangement.
Speeds up the finalisation of the overall deal.

Cons

XYZ needs to take on responsibility for accrued benefits, including in respect of inactives.
Analysis above suggests that there are huge potential costs/risks in this
XYZ needs to carry out detailed due diligence on this
Exactly what is it taking on?
does the plan comply with local legislation/requirements?
what is impact on XYZ's financial position?
XYZ may not want Target to continue offering exactly the same benefits for future service.
It may be a good time to introduce a something different if employees are more concerned about job security
Existence of surplus/deficit in the pension plan will complicate the negotiation on the overall deal.
XYZ needs to obtain advice/information/expertise on UK pension as it currently has no UK operations.

<u>Alternatives</u>

Target business not to retain responsibility for the plan
XYZ just acquire assets of Target, ABC retains Target as shell company with the plan
And possibly offer bulk transfer to a new XYZ plan

If XYZ proceed to acquire Target in full, negotiate reduction in purchase price because of "deficit" on fair-value/buy-out measures

<u>Further info</u>

Employee info
Inactive membership info
Confirmation of whether any other participating employers
Trust deed & rules

Trustee structure & MNT arrangements
Plan accounts & trustee reports
Communications issued to membership/employees about pensions
Details of any individual benefit arrangements or contractual promises
Any practice of discretionary augmentations
Any more recent actuarial advice and actuarial certificates
Actuarial factors in use, e.g. early retirements
Administration arrangements
SIP/ investment management arrangements
Insurance arrangements
Any compliance issues, opra reports, disputes, litigation, ombudsman cases

(iv) **need to explain to XYZ that the trustees control the appointment of actuary**

at least for statutory scheme actuary duties
and depending on scheme rules for other duties

XYZ may not control the appointment of trustees,

Which will be set out in scheme rules and need to comply with MNT regs
Existing trustees will be Target nominees, so may not want to co-operate with XYZ

even if XYZ appointees have "control" of the trustee body, they need to take account of the best interests of the membership and so may not follow the company's wishes

if you were appointed, you might have a conflict of interest in giving advice to both trustee and company

you would have to inform the trustees of this potential conflict
and your advice should point out the issues raised above about the plan's funding situation, etc.
you would need to contact the incumbent actuary
and generally comply with GN29 and the PCS

so before accepting, you should explain the potential conflict to XYZ
and explain that your advice to trustees would have to set out the implications for members of the trustees' decisions

2 (i) Benefits all have an individual price.
Ability to exchange one benefit for another.
Each employee given a "fund/allowance" to spend on their chosen benefits.
Could be a set of "core" benefits that all employees have to choose e.g. a minimum level of life assurance cover.
Could also be an upper limit on some benefits e.g. amount of holiday.
If all benefits chosen at their maximum level then the member may erode their basic salary.
Usually the options are reviewable only on set dates e.g. annually, to avoid unnecessary administration.

(ii) Share options; difficult to place a realistic value on them as the value will depend on the market price of the company's shares which is likely to be variable and subject to external influences.

Subsidised mortgages where the rate paid by the member is fixed; true cost to the company fluctuates as the subsidy relative to market mortgage rates fluctuates.
DB pension scheme
Bonus
Statutory benefits

(iii) 20 days holiday; statutory, valued by employee, perceived as a good idea all round
2 × salary life assurance; paternal, cheap for company to provide, prevents company providing hardship payments to widow(er)s of employees.
Basic level of PHI/disability insurance e.g. 40% of salary or a basic level of medical insurance cover, both for similar reasons to life assurance although not as cheap to provide.

(iv) Only desirable to certain people
Only applicable to certain sections of employees and hence discriminatory against other employees not fitting into that sub category.
- one sex only, e.g. a "well woman" clinic,
- families only, e.g. nursery care, crèche facilities,
- drivers only, e.g. a company car facility,
- employees in certain locations only, e.g. season ticket loans,
- homeowners only, e.g. subsidised mortgages

(v) Does the company want all benefits to be priced "fairly" or for there to be some deliberate cross subsidies?
How often can prices of benefits be reviewed, and how often can members change their selections.
Is there likely to be any selection against the company and in turn any insurance companies used to underwrite the benefits.
If benefits deliberately cheap within flex, this could encourage a very high take-up rate which could result in better insurance terms which means the low flex price can be justified
Actual cost
Price in the market for an individual
Accounting cost
Ensure no indirect discrimination, equal opportunities etc. to prevent claims against the company.
Are benefits to be based on a fixed price or a percentage of salary, or a combination of both?
Ensure the administration & record keeping is manageable.
New flex package should be seen as no worse than old style remuneration package in order that it is accepted by employees.
Is the company trying to cut overall benefit costs by the introduction of flex, or are they willing to invest in the project.
Competitors' packages may also be considered.

(vi) The current company contribution rate is likely to include a temporary reduction to take account of the surplus and hence is unrealistically low. The extent of the reduction depends on the amortisation period used.

After the surplus has gone the rate may increase dramatically which would prove unpopular with employees who suddenly have to pay more for their pension.
Thus the current funding approach does not necessarily remain stable in all circumstances.
The standard contribution rate (ignoring surplus) is likely to better meet the stability criterion, which would certainly be advisable under flex.
The projected unit method would not produce a stable rate if the average age/sex/salary distribution changes e.g. if the scheme is closed to new entrants.
Any contribution rate used under the flex system should ideally be durable to other changes in the scheme's demographics e.g. a large influx of new entrants or a bulk transfer in.
The company must be careful that any desired stability in the cost of pension benefits under flex does not distort the actual contributions paid into the pension scheme,
as this could harm the security of benefits
or even the ability to meet certain benefit payments.
The scheme must still be funded in accordance with the company's funding strategy having taking appropriate actuarial advice.
Important to distinguish the flex cost of pensions from the true cost and not let the former drive strategy.
The assumptions in the funding basis may be deliberately conservative leading to the contribution rate looking particularly high to the employees.
This could dissuade take up of the pension option, which in the long run is not good from a paternalistic viewpoint.
Younger members in particular may feel the rate is too high and not make adequate pension provision.
The rate is likely to change every 3 years or whenever there is an updated valuation.
Even the rate ignoring any adjustment for surplus i.e. the standard contribution rate for future service may not be appropriate for each employee for the following reasons
the rate is a global rate and is not appropriate across each and every age, the young will subsidise the old
males subsidise females
the rate may assume a rate of withdrawal in which case for stayers it will be too low and for leavers it will be too high
if no allowance for leavers in the rate then individual leavers are definitely paying too much, but OK for stayers.
the rate allows for mortality and thus is insufficient for surviving members

(vii) Alternatives:
Use age related rates
These could be based on Attained age method and age at entry to keep them stable for the member once they have joined.
But this will lead to seemingly high rates at young ages with the associated problems of poor take up.
Use sex specific rates
But this will highlight the sex discrimination problem.

Change to the Current Unit Method, to reduce the problems of the withdrawal profits.
Strip out any margins of caution in the basis to keep rate realistic.
Use a smoother measure of cost e.g. that calculated for the US accounts under FAS87
Annual reviews of the rate to prevent the potentially larger triennial jumps in rate.
Introduce a defined contribution scheme for future service that increases cost stability and is also a lot easier to put into a "flex" program
Introduce a career average scheme that is less prone to changes in cost associated with sudden changes in salary trends.
Don't flex pensions.
Offer different levels of accrual other than 1/60ths to give more flexibility e.g. 1/80ths, or 1/100ths at correspondingly lower prices.

(viii) There might not be any "flexibility" on the pension benefit which is contrary to the whole ethos of a "flex" program, i.e. may either be in the pension scheme for full benefits or not in at all.
If the cost of pensions is relatively high compared to other benefits then employees may be discouraged from joining. This could be short sighted, and is not a good paternalistic attitude from company's viewpoint.
By joining pension scheme this could impinge on the choice of other flex benefits if the pension scheme is a costly option.
Cannot choose the investment strategy to suit their individual risk/reward profile.
Cross subsidies may exist e.g. young to old, males to females.
Varying costs of pension scheme every few years could make individual budgeting difficult — may have to suddenly forgo other benefits to keep pension on target if the contribution rate rises substantially.
Depending on the design, other benefits e.g. life assurance, PHI may be dependent on members joining the pension scheme, which could force members into joining.
Not many companies flex final salary pension schemes and so no market experience to gauge against for pricing, administration.
Administration, IR limits and contracting-out requirements may be limitations.