EXAMINATIONS

September 2003

Subject 304 — Pensions and Other Benefits

EXAMINERS' REPORT

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.

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Chairman of the Board of Examiners

25 November 2003

Faculty of Actuaries **Institute of Actuaries**

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1 (i) Consider statutory requirements for benefit projections, if any
E.g. if your assumptions differ, there is a possible communication issue
Determine what ancillary benefits to allow for
E.g. spouses, dependants, pension increases, death benefits
Make best estimates of interest, mortality (pre/post retirement), future salary increases
Determine range for key assumptions
Determine from employer which expenses are to be borne by employer, and which by employee
If by employee, then needs to be built into contributions
Take account of proximity to retirement
So that if pensions bought out by annuity, projections for those close to retirement look sensible
Determine how future contributions are to be expressed (e.g. as % salary)
Determine how often contributions/contribution rates are to be reviewed

(ii) Summary of data used (e.g. salary, date of birth, pension age)
Summary of target retirement benefits: members/dependants
Results presented in monetary and real terms, e.g. as % salary
Benefits payable on death
List of key assumptions (yield, salary increases, pension increases)
Possible range in target benefits using different key assumptions
Give appropriate risk warnings
e.g. no guarantee that targets benefits will be met
State initial contributions/rates, member/employer
And how often contribution rates reviewed/adjusted
Performance of the fund
Legislative requirements
Ease of communication
Administration constraints
Simplicity
Fairness
Fund value

(i) Many candidates missed the point re statutory requirements for benefit projections; apart from this point, this part was answered well by candidates

(ii) Most candidates failed to list all the relevant data items to disclose, however candidates were able to list issues to consider when making the disclosure

2 (i) The scheme documentation/Trust Deed may require certain terms
There may be legislative requirements, existing industry or insurance custom and practice
Or competitive pressures
Exercise of the option should be neutral to the scheme

Need to consider an appropriate interest rate to value the benefits
E.g. the returns from an appropriate current medium to long term bond
If the intention is for a stable conversion basis, an average rate, or valuation rate could be used
In which case, the basis needs to be reviewed periodically
Need to set a mortality table
e.g. appropriate to those likely to exercise the option
Could assume that the member will select against the scheme
And that the option will only be exercised by those in poor health and/or dependants in good health
In practice, most members with dependants may exercise the option
And so no special allowance for mortality needs to be made
Factors should vary according to age of member and dependant
Assume average age difference and consider adjustment to factor if actual age significantly different
Could make allowance for additional admin costs
Need pragmatic solution to above points to ensure options easy to administer, and to be understood by members
Need to consider if the terms should take account of discretionary increases in payment

(ii) Possible restrictions:

Limit the proportion of pensions surrendered
Require evidence of the member's good health
Restrict exercise of the option to specified times, e.g. just before retirement, at time of marriage
Once elected, the decision is irrevocable
Restrict according to nature of relationship
Amend factors for large age differences

(i) Again, most candidates answered this part well and were able to list many relevant factors to be considered by the actuary.

(ii) Very well answered.

3 (i) SCR = 12%

Value of Assets	= 75m
Value of Liabilities	= 100m (160m – 60m)
Deficit	= <u>25m</u>

Value of 1% over total future service = 60m/12 = 5m

Amortisation = 25m/5m × 1% = 5%

RCR = 12% + 5% = 17% total
= 14% Company after 3% from members

(ii) Actuarial Value of Assets may be unduly conservative.

If based on actual split £75m becomes £80m.

However depends on overall strength of basis and the assumptions used to value both assets and liabilities, which should be consistent.

If value of past service liabilities only used then the funding method should be changed to PUM or AAM.

Under the PUM method the SCR will be higher than 12% since average age is 45 vs. Entry Age of 35; could be around 15%.

Why is current asset mix so far from benchmark, should this be taken into account in the assumptions for future investment return.

This would impact upon the valuation result.

Should the asset mix be changed to better match liabilities and minimise volatility of contribution rates.

Valuation funding method only determines the pace at which the cost is met — pay less now and more later or vice versa.

EAM could be maintained but reworked on a new entry age.

Which if amortised and added to reworked SCR may result in little or no change to the RCR.

However moving the Entry Age would change value of expected future contribution, thereby changing the past service deficit.

What are the company's recruitment patterns, what is a realistic entry age, will the scheme remain open to new entrants.

(i) Generally poorly answered with only the better prepared candidates scoring the full 3 marks; some candidates failed to use formula relating to Entry Age method and some didn't subtract members contribution at the end, and hence didn't gain easy marks

(ii) Most if not all candidates recognised the importance of consistency between assets and liabilities assumptions, but many candidates then concentrated on difference between market-related and long term assumptions, and not the appropriateness of EAM; overall, not very well answered, with the better prepared candidates recognising the issues in the question

4 Advantages

- more competitive scheme, valued by employees, attract/retain staff

- paternal

- consistent with previous arrangements possibly

- may appear a better scheme, but at little extra cost if money purchase funds perform well.

- better death in service spouse's pensions possibly

Disadvantages

- may be subject to extra regulation i.e. DB in addition to DC
- more complex/costly to administer
- employees may not value underpin
- extra funding cost if underpin bites
- lack of cost control, additional volatility
- more difficult to incorporate into flex
- employee antiselection

(ii) Member choice of fund, therefore company cannot influence, unless it imposes an underlying investment strategy on the members (via the Trustees)

Limit the number of choices to minimise number of investment outcomes

Use "lifestyle" as a default as this could roughly match the underpin pension liability.

But for leavers it is difficult to match transfer values or (ill-health) early retirements simultaneously as the retirement liability.

If underpin not expected to bite then any special investment considerations can be ignored.

Availability of suitable derivatives/financial instruments.

Limit number of member switches.

(iii) Terminal funding — only pay for the guarantee as and when it bites on a "pay as you go" basis. Do nothing until guarantee bites.

Set aside reserve, which could be calculated using stochastic modelling techniques.

Pay "arbitrary" extra contribution to a reserve and top-up if necessary.

(iv) Use stochastic modelling to meet expected cost of all retirements in 95% of the likely investment scenarios, and meet transfer value guarantees, ill-health early retirements as and when arise.

In using stochastic techniques it would be necessary to identify the risks and set appropriate objectives.

For example is the risk to be measured by inadequate reserves for retirements or other pre-retirement contingencies.

Unlikely to be able to meet guarantees in all circumstances due to different investment time horizons and hence expected returns.

What percentage of "failures" can be tolerated, should be measured by amounts not incidence.

Consider number of retirement / leavers / deaths expected.

Decide on the underlying stochastic model e.g. Wilkie.

Model attaches probabilities to future investment returns and economic scenarios.

Run the model to produce estimated fund values and hence money-purchase pension.

Run 1000's of simulations as required.

Repeat the exercise for alternative member investment choices.

Consider the mean and standard deviation of results.

Where the money-purchase pension is less than the guarantee, place a present value on the excess to establish the reserve required.

Limitations of the model.

(i) Very well answered

(ii) Very poorly answered as most candidates failed to recognise that this is a DC scheme, where investment choice is with the members

(iii) Very well answered

(iv) Very poorly answered as most candidates simply wrote down everything they can remember on ALM rather than answering the question, e.g. most were modelling different company's investment strategies and not different member investment choices

5 Data

Prospective membership data to carry out calculations
Sex
Date of birth
Date joined company
Current earnings
Historic earnings

Company view on how long people work for them
How working period may be changed by new benefits
Likely turnover of staff
Including any immediate changes as a result of the purchase
New employees likely patterns

Will all employees be offered membership
Any eligibility conditions
How will "earnings" be defined
Relationship with basic salary
What is expected future increases
Earnings patterns over working lives
How much will members be asked to pay
Will there be any death benefits
What happens on withdrawal
Will pensions increase in payment
Any guarantee period
Can pension be exchanged for cash
Surrendered for other benefits

Any legislative controls e.g. preservation,
LPI
Any security/funding controls for minimum funding

Will benefit be funded
Will benefit be guaranteed or targeted
If funded how will it be invested
How much can the company afford

Taxation system
To set assumptions — what are current economic conditions
Data to estimate future conditions
e.g. inflation, earnings, investment
mortality statistics for the country

Implications of any accounting standards

What are the state benefits?
Should scheme benefit take account of any state benefits?
Any contracting out ability

What do other companies do
Why is the client introducing the benefits
Any appropriate alternatives

Any professional guidance notes to consider

What insurance arrangements can be put in place to cover costs.
Will pension be payable immediately in completion of 20 years service or only on attaining a given age.
What is the employee's contractual retirement age from the company.
How will members who complete less than 20 years service be treated.
From what age are any State benefits paid.
Does legislation require benefits to be non-discriminatory.

Lots of scope to gain marks for the better prepared candidates; overall, most candidates answered this question reasonably well, with the better prepared candidates scoring higher marks as they related their answers to the question, e.g. considering treatment of members with less than 20 years service, or recognising that many factors would emerge from discussions with the company.

6 (i)

retirement
- pension
- lump sum
- early/late

protection
- death after retirement pension
- death after retirement lump sum
- death before retirement pension
- death before retirement lump sum
- spouses
- other dependants/children
- ill-health pension/lump sum

withdrawal
- cash on exit
- transfer payment on exit
- deferred pension
- protection benefits

(ii)

sex:
- option pricing

e.g.	-	transfer values
	-	commutation factors
	-	early retirement factors
(dc)	-	annuity conversion rates
	-	protection benefits
e.g.	-	provision of spouses pension
	-	access
e.g.	-	entry age and conditions
	-	normal retirement age
	-	pension benefit
e.g.	-	accrual rate
(dc)	-	contribution rates
	-	indirect
e.g.	-	part-timers
	-	fixed offset from earnings
	-	fixed term contractors

age:

	-	option pricing (as for sex but less obviously relevant)
(dc)	-	compulsory annuity conversion
	-	protection benefits
	-	reduction in spouses pension for young spouse
	-	access
e.g.	-	entry age and conditions
	-	normal retirement age
	-	pension benefit
	-	late retirement benefits
(dc)	-	contribution rates
	-	hybrid schemes (dc to fixed age; db thereafter)
	-	indirect
	-	preservation terms

disability:

- protection benefits (exclusion from)
- life cover
- PHI
- IHR

or special terms apply

(iii)

- in relation to the change in option pricing, it is possible that either a surplus or deficit will have arisen
- the change will affect the cost every time a member reaches a position of deciding whether to exercise the option
- need to calculate the value of the benefit at the option date
- which might depend on market conditions at that time
- and compare the value on the revised factors
- and on the old factors

- the change will also affect the take up rate of the option
- a more generous factor for both males/females will make it more likely that the option will be exercised
- but if there is a reduction in the female factor for example (which might be the case if the factor is set in relation to the proportions of male/female members)
- than the take up rate for females will probably reduce
- though the magnitude of the change will be hard to assess.
- particularly if the value of the pension alternative changes (e.g. the pension becomes more valuable as long term interest rates fall)
- or the relative tax treatment of pension/cash benefits differs

(iv)

- the deficit will have emerged because the experience of the scheme in the intervaluation period
- will have been different to the assumptions made at the last valuation
- and unfavourable overall
- it is therefore necessary to identify each of the assumptions
- and assess the experience relative to the assumption

the assumptions will include:
  - financial factors
  - demographic factors
  - that the benefits payable won't change
  - including the pricing of options
  - that the valuation basis won't change and
  - that contributions at the balancing rate have been paid

- examples of financial factors that will require investigation are:
  - the rate of return on the scheme assets
  - the rate at which salaries have increased (general salary inflation)
  - the rate at which pensions have increased (if linked to price inflation)

- examples of demographic factors that will require investigation are:
  - the rate at which people have been promoted
  - and the corresponding salary increase awarded
  - the withdrawal rate
  - the mortality rate before retirement
  - the mortality rate after retirement
  - the morbidity rate

(i) Well answered, although many candidates could have gained more easy marks by listing out all retirement benefits, eg most missed out withdrawal benefits; other candidates didn't answer the question and simply listed all benefits (including non-retirement benefits) found in the core reading, and hence wasted valuable exam time

(ii) Fairly well answered

(iii) Not as well answered as many candidates failed to relate their answers to the question being asked, and some listed and discussed in detail all the different options (eg early retirements, transfer values, cash commutation) and hence wasted valuable exam time

(iv) Fairly well answered as this was pretty much a bookwork question