

EXAMINATIONS

September 1997

Subject H — Pensions

Paper One

EXAMINERS' REPORT

COMMENTS ON ANSWERS

Question 1

Generally well answered

Question 2

Candidates who listed the options and then made general points generally fared better than those who considered each option separately.

Candidates often did not specify how unisex terms could be derived.

Question 3

This question was not well answered. Few candidates considered the problems of communicating the benefit structures they proposed.

Question 4

Few candidates stated that public sector schemes are frequently unfunded or partly unfunded.

Question 5

Few candidates recognised the potential impact of selection against the scheme by employees who expect to leave service in the near future. No marks were awarded for suggesting an asset liability study.

Question 6

Many candidates seemed to confuse funding with costing and accounting. Some candidates stated incorrectly that funding is required by SSAP24, or for SSAP24 to be applied.

Question 7

Most candidates did not provide as much detail on the preservation requirements as was expected when the question was set.

Some candidates stated incorrectly that benefits on retirement in respect of a transfer in would automatically be subject to a "value for money" check.

Question 8

In questions such as these, candidates should remember to be clear as to whether points are advantages or disadvantages.

Questions 9 and 10

Bookwork.

Questions 11

Generally well answered although more marks could have been gained by providing more detailed proposals for meeting the developing country's government's aims.

Question 12

Well answered.

Question 13

Candidates were not aware of the significant drawbacks to using the discounted income method as was expected by the examiners.

International problems with the discounted income method (lack of international acceptability, difficulties in applying the method to overseas equities, complying with international accounting standards) received scant comment.

Question 14

Generally well answered although more detail could have been provided in the answers to part (ii).

1 Different methods of calculation of expected return; eg time weighted vs money weighted.

Different absolute performance target; eg a market index vs industry average.

Size of funds of Schemes A & B permit different investment medium with higher/lower potential return.

Level of surplus in scheme permits greater investment freedom.

Schemes have different liability profiles requiring different investment strategies.

MFR constraints.

Trustees decided to adopt different strategies

Additional marks available:

One scheme may be approved and the other unapproved/one may be a gross fund and the other a net fund.

One yield may be measured before deduction of investment expenses and the other after.

No additional marks for:

The yields may be measured over different periods.

2 Likely options involved:

- transfer values out
- transfer values in
- commutation of pension for lump sum
- surrender of pension for additional spouse's pension
- benefits for AVCs
- early retirement
- late retirement

Need to ascertain who is responsible for setting option terms. It may be the trustees, in which case company needs to discuss with them, as there may be cost implications.

It is not a legal requirement to provide equal options, the terms of which are actuarially determined.

General approaches to the calculation of unisex factors are:

- take the average of the male factor and the female factor
 - this could be weighted by the actual numbers of each sex in the workforce
 - but the proper weight should be those taking up the option, which may be affected by the terms offered
- derive a unisex life table, based on weighted average decrement rates
- if the workforce is overwhelmingly of one sex, the option terms could be based on mortality of this sex

In all of the approaches above the scheme runs the risk that the option will only be exercised by the sex for whom the terms are most advantageous.

This would result in an increase in the cost of the scheme.

This may be acceptable to the company, especially if the potential extra cost is not significant.

But could use either the male factor or the female factor, whichever represents the least risk to the scheme.

- this would result in the use of female factors for most options, reflecting the longer life expectancy of women
- except that transfers-out would be calculated on male mortality, making them less generous for women, but making transfers-in more generous for women
- but watch requirements of GN11
- this would tend to price options too expensively for one sex, most likely men

A more radical approach would be to reconsider some of the benefits offered.

- if only money purchase benefits are given for transfers-in and AVCs there is no pre retirement discrimination.
- commutation could be regarded as a fixed benefit
refuse to accept transfers-in

Additional marks available:

Any sensible comment on the effect on administration.

Any sensible comment on the impact of changing proportions of male and female over time.

No additional marks for:

Ill-health ER as an option.

- 3** Could treat part-timers in exactly the same way as full-timers, by counting each year in full and applying this to final salary irrespective of hours worked.

But this would ignore the likelihood of changes in each employee's status.

- eg changes in the number of hours worked
- or moves between part-time and full-time service

And would leave the finances of the scheme vulnerable to switches from part-time to full time shortly before retirement.

A more common approach would be to calculate service and final salary in terms of its full time equivalent.

- based on the numbers of hours worked against the full-time hours, possibly on a monthly basis.

Alternatively, calculate part-time benefit separately from full-time and add the two together.

- this could get complicated if hours worked changes frequently

Either approach above is unlikely to be well understood by employees.

And a good communication program is essential, especially when employees are changing from one status to the other.

A defined contribution category for part-timers could be considered.

- but this may still be complicated if employees move between full-time and part-time employment
- and part-timers are only a small proportion of the workforce, so the complications arising from this approach may not be justified
- there may be indirect discrimination claims if part-timers predominantly of one sex unless money purchase scheme is equivalent to final salary scheme
- you do not have to include part-timers if you can justify their exclusion on business grounds but beware indirect discrimination.

For those who move from full-time to part-time employment, life cover would reduce automatically.

- this may discourage such a move
- to avoid this, could guarantee that life cover does not reduce in these circumstances

Additional marks were available for:

Look at what competitor companies do.

4 Compared with private sector schemes, public sector schemes tend to:

- be bigger
- be unfunded
- provide index-linked pensions
- be members of transfer clubs for early leaver benefits
- pay less lump sum death benefit
- be established by statute, not trust
- pay retirement benefit as pension plus cash, not pension which can be commuted in part for cash
- provide spouse's and children's pensions based partially on accrued and partially on projected members' pensions
- be generally defined benefit rather than defined contribution
- be exempt from some UK legislation
- be often prescribed and inflexible
- have generous redundancy terms

No additional marks for:

There are fewer public sector schemes.

Public sector schemes tend to be contributory.

Public sector schemes tend to be non-contributory.

Public sector schemes tend to be similar to each other (covered by the point that they are often prescribed and inflexible.

- 5** Derive the age and sex related costs of the final pay pension benefit, expressed as a percentage of pay.

These costs would be calculated on a projected unit method

because this reflects the cost of each year's accrual and makes allowance for projected pay.

Use best estimate assumptions to get a more accurate assessment of the cost. [Credit may be given for additional comments on determining assumptions.]

Compare these costs with 8% at each age and for each sex.

The higher of the two gives the age-related cost assuming the most expensive option is chosen.

Apply these rates to payroll figures by age and sex to derive overall cost.

Allow for expected administration costs.

This approach assumes that employees will tend to opt for the benefit which is financially most advantageous to them.

In practice, employees may not be well informed enough to act in this way and the approach above may slightly overstate costs.

However, this may be more than offset by employees selecting against the scheme, typically by those employees expecting to leave service in the near future taking the defined contribution option.

Some allowance for this could be made in the assumptions by adopting lower withdrawals rates.

In practice a range of costs may be given.

Costs will depend on investment strategy.

No additional marks for:

Any comment on asset liability modelling.

- 6** To provide more security for the benefits promised which is independent of the future fortunes of the employer.

Because it is expected of companies in the UK and there would be considerable pressure from employees and unions to fund.

Funding creates the discipline of spreading the cost of the benefits over the working lifetimes of those employees who are to receive them so assets/cash available when required to meet benefit payments.

By funding you may be insuring against this employer being less profitable than another.

To take advantage of tax incentives.

To anticipate UK legislation which will require a minimum funding requirement.

No additional marks for:

Achieve, through external investment, a better rate of return than the company's internal rate of return. (Covered by "may be insuring against this employer being less profitable than another".)

Comments about stability or flexibility.

Comments about SSAP24 or FAS87

7 Options

Deferred benefits

pension payable from NPA

must qualify for scheme's normal post retirement pension increases

must qualify for scheme's normal widow's/dependant's death after retirement pension

the pension must be revalued to NPA by the lesser of 5% for each complete year to NPA or the rise in the RPI over the same period

members' contributions would normally be payable on death before retirement, possibly accumulated with interest

a spouse's or dependant's pension may also be payable on death before retirement

Transfer Value

to another occupational pension scheme or to a personal pension calculated in accordance with the requirements of GN11

Early Retirement Pension

normally calculated as deferred pension × early retirement factor

normal scheme basis may be more generous,

or enhancement may be payable because of the redundancy

eg equivalent of past service reserve or accrued pension with no actuarial reduction or accrued pension with extra notional service and no actuarial reduction

Factors Affecting Benefits

Deferred benefits

short service benefits must be calculated on same basis as long service benefits.

ratio (initial amount of pension) / (pension which would have been payable had he remained in service to NPA)

must be at least as big as the ratio (service completed)/(potential service to NPA)

TV in service vests in full (but member may not get value for money)

Transfer Value

must represent a fair value of the deferred pension

must make allowance for guaranteed pension increases and for discretionary increases to the extent decided by the trustees

the part of the TV relating to the TV paid in must be equitable in relation to and consistent with the TV in
the TV may be reduced if there is a discontinuance shortfall

Early Retirement Pension

must be at least equivalent in value to the deferred benefits

8 (i) Marks are awarded for a selection of three of the following.

(a) **Revalued career average scheme**

Pension is based on a fraction or percentage of total earnings earned during pensionable service,

each year's earnings being revalued in line with RPI or NAE.

Contributions are 5% of total earnings in each year.

(b) **Pensionable earnings = total earnings**

Final pensionable earnings = average of the best 3 years pensionable earnings out of the last 10.

Pensionable earnings could be revalued in line with RPI or NAE in this calculation.

Pension at retirement = fraction or percentage of final pensionable salary for each year of pensionable service.

Contributions are 5% of total earnings in each year.

(c) **Pensionable earnings = total earnings**

Final pensionable earnings = basic earnings + average of the best 3 years fluctuating earnings.

Fluctuating earnings could be revalued in line with RPI or NAE in this calculation.

Pension at retirement = fraction or percentage of final pensionable salary for each year of pensionable service.

Contributions are 5% of total earnings in each year.

(d) **Pensionable earnings = basic earnings**

Final pensionable earnings = last or average of last 3.

Pension at retirement = fraction or percentage of final pensionable salary for each year of pensionable service.

Contributions are 5% of basic earnings in each year.

(e) **As *d* but pay a percentage of fluctuating earnings into a money purchase arrangement.**

(ii)

(a) **Revalued career average scheme**

Advantages:

- Contributions and pension are based on the same pensionable earnings.
- Funding position is not significantly affected by large salary fluctuations - smoothing effect.

Disadvantages:

- Earnings records have to be kept for many years.

- If RPI is the link then the pension may be less than the members expect.
- If NAE is the link then this may produce a higher or lower increase than the increase to members' basic earnings.

(b) **Average best 3 in last 10**

Advantages:

- Pension not tied to earnings too close to retirement.

Disadvantages:

- Unless pensionable earnings are revalued the pension may not represent a reasonable level relative to earnings close to retirement.
- Employer costs may be a higher proportion of the total cost than in a career average scheme.
- Contributions drop towards retirement if employee earnings drop.

(c) **Total earnings (basic + average 3 years fluctuating earnings)**

Advantages:

- Credit is given in the pension for earnings in excess of basic.

Disadvantages:

- Unless pensionable earnings are revalued the pension may not represent a reasonable level relative to earnings close to retirement.
- Contributions drop towards retirement if employee earnings drop.

(d) **Basic earnings**

Advantages:

- Contributions and pension are based on the same pensionable earnings.
- Costs are lower/reduced.
- Admin is less than other options (fewer records need to be kept).

Disadvantages:

- If the difference between total and basic earnings is significant then the pension may not represent a reasonable level relative to earnings.
- This could be overcome by having a higher accrual rate but the choice of accrual rate could be difficult if different employees have different levels of excess.

(e) **Contributions in respect of fluctuating earnings paid into a money purchase arrangement**

Advantages:

- Credit is given in the pension for earnings in excess of basic.
- May be easier for members to understand and appreciate.

Disadvantages:

- Extra administration involved.

If fluctuating earnings are low in some years the contribution will be very small.

No additional marks for:

Persuade employees to put a percentage of fluctuating earning into AVCs (not a scheme benefit design).

9 (i) SCR

- The present value of all benefits which will accrue in the year following the valuation date (by reference to service in that year and projected final earnings).
- Divided by the present value of members' earnings in that year.

AL

- The present value of all benefits accrued at the valuation date (based on projected final earnings).

RCR

- The SCR plus or minus an adjustment for any surplus or deficiency (of assets relative to the AL).

(ii)

- The aim is to keep the funding level at 100%,
- where the funding level is the extent to which the asset value covers the present value of the liability for accrued benefits
- to produce a stable contribution rate if age/sex/salary profile remains the same
- recognise the cost of benefits as they accrue.

(iii) A control period of 3, 5 or 10 years is typically chosen.

The SCR is calculated by dividing the present value of the benefits which will accrue during the control period (by reference to service in the period and projected final earnings),

by the present value of members' earnings during the same period.

Especially if the control period is long, an allowance for new entrants should be made.

(iv) This scheme may start with few older members.

It is likely that the average age will increase over time.

The PU method, unadjusted, would then underestimate the SCR.

The use of a control period will allow some of that increase to be anticipated in the calculated SCR.

If the assumptions are realised then the assets should at least cover the accrued, projected, liabilities at the next valuation date, and, if the SCR is not changed, at the end of the control period.

It is likely that the SCR will have to increase at the next valuation but by less than if there had been no control period.

10 GN27 details the method and basis for the MFR and schedule of contributions calculations.

This should enable achievement of the Government's stated intention that the results of an MFR valuation should be the same for any scheme regardless of which actuary carries out the valuation.

Liabilities - those payable if the scheme were to wind up
- expenses should be allowed for

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If members can exercise without consent options to give benefits which are more valuable than the basic benefits then the most expensive options should be valued.

No allowance should be made for future discretionary benefits.

The value of non pensioner liabilities must be adjusted by a Market Value Adjuster to allow for current market conditions.

If the value of pensioner liabilities exceeds £100,000,000 a MVA can be applied to part of the value.

Assets - taken at audited market value.

The Contribution Schedule should set out contributions necessary to cover the MFR.

The principal assumptions set out in the basis are:

Average equity returns will exceed average gilt returns

pre retirement - by 1%pa
post retirement - by 2%pa

Return on equities - 9%pa pre pension age
- 10%pa post pension age

Return on gilts - 8%pa (non pensioners)
- current gilt yields (pensioners)

Inflation - 4%pa

LPA - 3.5%pa

Additional marks available:

(If details of the basis/method not given)
GN27 details the valuation basis/method to be used.

(If details of the assumptions not given)
GN27 details the valuation assumptions to be used.

Any other assumption as set out in GN27.

Comment that the basis/assumptions are under review following the budget and the removal of the ability to reclaim ACT credit.

11 Tax advantages apply to tax-approved pension schemes.

These satisfy conditions about the types of benefits that they provide e.g. there are only very limited circumstances in which the funds can be removed before retirement age.

Employer contributions - allowed as a business expense

- not assessed as benefit in kind in the hands of employee

Employee contributions - deductible at the employees' marginal rate of tax
- subject to a maximum rate of contribution
- return of the contributions, on withdrawal after <2 years, subject to a tax charge of only 20%

Investment returns - free of income and capital gains tax
- unless excessive assets have accumulated

Benefits - pensions taxed as earned income
- tax-free lump sum (retirement or death)

Changes:

Investment:

- Set rules for investment of approved schemes e.g. no overseas investment, at least 50% investment in government bonds.
- Make investment income / gains from certain sources taxable:
- Could have a scale of rates e.g. overseas investments taxable at full rate, investments in the country other than bonds taxable but at a low rate.
- Gross investment results in bigger taxable benefits so taxation issue is a question of timing.
- Comment about change ACT credits
- Have to ensure that there are enough government bonds to support demand.

Higher paid:

- Exclude the higher paid from scheme membership altogether.
- Only allow pensionable earnings up to a cap.
- Or pensions up to a cap.

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- Only allow employee contributions to be deductible at basic rate of tax (but this might merely encourage non-contributory schemes).
- Higher rates of tax for the higher paid on pension investment income (difficult if scheme is a group DB scheme).

Disabled:

- Make payments to support disabled dependants a permissible scheme benefit.
- Allow special tax privileges (e.g. tax deductibility) for those who pay contributions to a pension plan for a disabled relative.
- State pays contributions/matches contributions made for the disabled.

Pension:

- Don't allow lump sum benefits from approved schemes, or if they are allowed do not make them tax-free.
- Require pension schemes to provide index-linked benefits, so that value does not erode in older age.
- Compulsory spouses pensions.
- Set the pension increases at a rate matched by the returns/growth provided by government bonds.

12 In general:

insurance increases the predictability of the cost
insurance mitigates the catastrophe risk

Insure fully:

smaller schemes

new schemes which haven't yet built up sufficient reserves to absorb fluctuations

to avoid disinvestment for mature schemes with matched investments

if it represents good value for the scheme (i.e. members' mortality is sub standard)

No additional marks for:

Competitive/cheap rates (covered by "if it represents good value for the scheme....")

Larger schemes:

use catastrophe insurance
don't pay profit margin to the insurance company

No additional marks for:

Stop loss (include with catastrophe insurance point)

13 Advantages of the discounted income method ("DIM")

Automatically values assets consistently with liabilities.

Historically successful at smoothing fluctuations in (UK) asset values.

Can use same assumptions for determining past service liabilities at successive valuations (enhances credibility with client).

Automatically uses long term assumptions for setting the future service contribution rate.

Comparison with previous valuation (i.e. analysis of surplus/future contribution rate is easier).

Doesn't influence investment manager's choice of investments

Disadvantages of the DIM

Lay people may find it difficult to accept a value placed on the assets substantially different from the market value.

Choosing the dividend growth assumption is subjective but has a major effect on the past service position.

The notional portfolio may not reflect the actual investments thereby removing (or reversing) some of the smoothing property of the DIM.

The DIM relies for smoothing of equity values on the behaviour of UK companies deliberately stabilising dividends.

There is no financial economical justification for the DIM.

The DIM doesn't work so well for overseas equities (because portfolios frequently bear no relation to the index and overseas companies don't necessarily try to stabilise dividends as in the UK).

Discounted mean term of assets may not be the same as that of the past service liabilities (which is not explicitly taken into account for the DIM).

Not relevant for discontinuance/MFR calculations.

The DIM is not internationally accepted (e.g. not in US).

The company might want to use SFAS87 for funding purposes (which does not permit the DIM).

14 (i) Mortality of pensioner.

Use standard table.

Mortality of dependants/spouses/children.

Use standard table but (see below) PMA80 C10 etc

Usual to ignore mortality of children and just use compound interest.

Age at which children's pension will cease. Probably latest age.

Rate of investment return.

Same as valuation rate typically 9.0% but depends on investment strategy.

Rate of pension increase

which may differ for separate pieces of pension eg GMP, LPI may be 4.5%.

Remarriage (if pension ceases/changes).

Proportion married or with dependants at death.

May use bespoke table or simple percentages such as 90%.

Age difference between pensioner and spouse

No additional marks for:

Guarantee period.

(ii) The general principles behind the analysis are as follows:

- Collect data.
- For each age nearest,
- and male and female separately.
- Calculate the exposed to risk at that age,

- Calculate the number of deaths at that age.
 - Derive the relevant rates of mortality.
 - In theory separate analysis will be carried out for mortality of members, dependants and orphans.
 - If the scheme membership is small,
 - then the amount of data is likely to be insufficient to produce a reliable statistic.
 - The experience analysis may therefore be restricted to analysing the actual number of deaths versus the expected number based on membership data at the last actuarial valuation.
 - Again, if the scheme is small, it will be important to exclude any unusual occurrences, eg multiple deaths due to a related incident.
 - Subdivide by early/normal/late retirement
- (iii) For the very largest schemes, the analysis could help shape the mortality assumptions.

This is more likely to be a scheme specific adjustment or blending of published tables rather than creating a new table from scratch.

Most schemes, however, are not big enough for an analysis to be statistically meaningful and often data are incomplete.

The purpose of the analysis would typically be to identify sources of surplus/deficit or to indicate broad adjustments needed to standard tables.

For smaller schemes unlikely to do the analysis and would use standard tables.

Don't want to overstate mortality OR want to allow for future improvement in mortality.