Institute of Actuaries of India

October 2009 EXAMINATION

Subject ST4 — Pensions & other Employee Benefits Specialist Technical

MARKING SCHEDULE

A1

a) A plan where the benefit for each year is related to the pensionable earnings in that year alone. The benefit is increased from the year in question to the time the benefit becomes due in line with a specified rate (fixed or with reference to an index).

b) A plan where a percentage of pensionable earnings is set aside each year for each member. The amount is then accumulated each year with a pre-determined interest rate or growth rate. The accumulated balance at retirement may be used to secure an annuity for the member.

c) A defined benefit plan where the benefit is calculated with reference to the final earnings of the member. Often this could be averaged over a certain period e.g. previous 3 years

d) A plan that has an element of defined benefit and defined contribution in its plan design. Either offering the better of benefits on either of the bases or where a different form of benefit is provided for different sections of membership, or different earnings bands.

e) A form of benefit provision where the member has a choice about the type and level of benefit to be received. It usually involves making a choice of receiving salary instead of other forms of benefits or vice versa.

[5]

A2

- Data checks are a critical part of the valuation process
- One has to balance the practicality of the level of checking with the significance of the impact of that data item
- It is therefore an area where some judgement may be required
- Broad level of checks include:
    - Reconcile data with last valuation e.g. member numbers reconciled from last time to this time's valuation taking into account leavers, joiners and changes in status
    - Reconciliation of membership should be done for each category of membership (actives, pensioners and deferreds)
    - Checks for the existence of new members
    - Checks against the trust accounts which may indicate significant movements in membership like a bulk transfer or bulk annuity purchase
    - Compare averages with last valuation data:
        - Ages

- Salary
- Past service
- Pension

- Check for total pensions in payment data with that of the last years accounts pensions paid
- Check for last accounts last years' contributions paid (member and employer) with total salary roll at the valuation (taking into account salary increase)
- Check individual data for missing data
- Check for maximum and minimum in the data and consistency with scheme rules (e.g. date of joining in a closed scheme, ages of new entrants and maximum ages)
- Conduct random spot check on individual data with records (e.g. director or CEO or trustee)
- Check asset value provided against accounts and/or fund manager statements

[7]

A3

There are two aspects to investigate – general increases and promotional/age related increases.
Need to use members present at both valuation dates. Otherwise we will be looking at the experience over two different populations and the answer may be false.
One method is to develop a table which compares for various age groups the average salary at this valuation and the average salary at the last valuation. Any increase is due to both general and promotional increases.
This can be compared with what was expected.
To analyse promotional increases separately you need to identify the global cost of living rises awarded each year over the intervaluation period.
This is most easily done with the company's help.
Alternatively for each age group you could compare the average salary of all members at the last valuation with the average salary of all members at the current valuation. This should indicate the general increase in pay excluding promotional increases.
However, this figure can easily be distorted and should be treated only as a rough guide.
National salary inflation can also be a useful indicator.
Once the actual cost of living increases have been identified, this can be removed from the figures to identify the actual promotional increases and hence compare against expected promotional increases.

[7]

A4

(i)

Information to be included;
Employee data (name, salary etc)
Statement of assumptions
Brief details of scheme (retirement age, form of pension, single life etc?)
Total projected pension at normal retirement date
Current fund value
Projected pension from retirement date in respect of current fund.

(ii)

- Should the actuarial assumptions be prescribed by the regulator or left to actuary's judgment
- Should the actuary show alternative projections on the basis of different assumptions to illustrate sensitivity of the projections to the assumptions made?
- Should all schemes be required to single life pension, or joint life, so that Projections prepared by different schemes are consistent?
- Or should this depend on actual marital status?
- Should the actuary be required to use current annuity rates or some other basis? (e.g. allowance for worsening of rates in future)
- Should the results to be presented as a monetary amount of Pension or as a % of projected final salary?
- If a monetary amount of pension B shown, then should this be discounted in some way to show its current value in real terms?

[10]

A5

(i) A transfer value is the payment made from one plan to another in respect of a member's accrued entitlement in the transferring scheme. The transfer value should reflect the expected cost of providing the benefits within the transferring plan.

(ii)

a. The member should be treated fairly and the value should reflect the value of the benefit in the original scheme so the member is no worse off

b. A transfer value involves a physical movement of cash and so the transfer value should be market related in order to prevent the scheme being exposed to risk from market movement of its assets

c. One should consider the regulatory / legislation requirements in the country e.g. in respect to minimum values or actuarial bases

d. What level of any discretionary benefits should be included in the transfer value basis e.g. allowance for discretionary pension increases

e. Consideration needs to be given to the level of funding of the scheme (on a transfer value basis), especially if there is a shortfall. In this case, a decision is

needed on whether transfer values should be reduced in order to protect the security of the remaining members' benefits

f. One should ensure that value for money is given for benefits that have been transferred in from previous schemes by a member

g. In setting the market related basis for calculation , one will have consider whether the basis should reflect the assets held by the scheme as a whole or assets that are appropriate to the benefits and member transferring

h. Decide if the member should bear the cost of the transfer or should the scheme

i. Whether any variations in the sponsor covenant should be factored in to the extent of any reduction in transfer value where there is a shortfall

(iii)

a. The transfer value would reflect the value of the deferred leaving service benefit and the link to any final salary at retirement would be lost. The transfer value would commonly only allow for revaluation in deferment, which would be be less than salary growth. When the service credit is calculated in the new scheme the final salary link is re-established using the transfer value and so results in less than the 5 years service in the original scheme.

b. The member may have also received a pay rise on his taking up new employment

c. The benefits in the new scheme are different such as a better accrual rate, lower retirement age, higher guaranteed pension increases, higher death benefits

d. The transfer value may have been reduced on account of a lower funding level

e. The assumptions such as discount rate and mortality may be stronger in the new scheme when calculating the service credit compared to when the transfer value was calculated (i.e. lighter mortality and lower discount rate)

f. There may be an allowance for the value of discretionary benefits in the new scheme and this is not allowed for in the transfer value, therefore placing a higher value on the benefits in the new scheme

[10]

A6

(i)

Insurance may be on a non-par or profit sharing basis.
A profit sharing arrangement can be set up whereby if the experience of the scheme is good enough they will share some of the profit with the insurers according to pre-determined formula.
Premiums may be calculated from :

- Unit rate (based on age and gender profile) which is often guaranteed for a period up to three years and applied to the total benefits to be insured or

- The sum of charging separate single premiums in respect of the potential death benefits of each member.

The premium will be based on many factors, including occupation, geographical location etc.
Spouse's pensions may be insured by a contract for the insurance company to pay the pension.
Or more approximately by increasing the lump sum payable on the death of the member under a group policy.
Evidence of health will not be required for sums insured up to the free cover limit.
The free cover limit will be higher where more members are covered.
The free cover limit will also be higher where all employees are automatically covered for life insurance.

(ii)

The main advantage of insuring the death benefits is that cashflow problems that arise from having to pay large sums at unpredictable times will be avoided.

Cashflow problems would be more likely to occur when paying out lump sums. Spouse's pensions are usually less of a problem in this respect as paid over a period.

For small schemes insurance will provide valuable protection against possible insolvency too.

Also for new schemes a few more deaths than anticipated could jeopardise the security of the remaining members accrued benefits if the death benefits were not insured.

Another advantage of insuring the death in service benefits is that the insurers take the mortality risk on.

The main disadvantage of insurance is that insurers write this business to make profit. Purchasers of the insurance therefore lose out by contributing towards this profit.

However, group life is a very competitive class and the profit margin is not large.

Premiums will however include allowance for expenses and contingencies,

Small schemes may also use insurance to protect against liquidity risk if the death benefits were not insured.

[12]

A7

(i)

- reduce the accrual rate e.g. 1/80
- reduce the pension accrued by an amount based on the actual amount of State benefit e.g. (1/60 x salary) – (1/40 x State pension)
- alter the definition of pensionable salary to be salary less an offset based on the State pension e.g. (Salary – 1.5 x State pension)
- above two examples are the same, just presented differently

(ii)

Reduced Accrual
+ relatively good for low earners
+ broadly consistent with the target benefit
+ it is simple to calculate
+ easy to understand for members
+ the formula is not directly related to the State benefits and so can be changed easily

if the State benefits change
- a lower accrual rate may not be perceived as good as presenting the accrual another way
- it only achieves the 2/3rds of pensionable salary for someone on average earnings

Reduced pension
+ achieves the target explicitly for all members
+ a higher accrual is better perceived by members
- tougher to make any employee contributions definition clear
- the company provision is exposed to changes in State benefit
- more difficult to understand for members
- not good for lower earners or part time employees
- members could loose out if their contributions are related to full salary but the pension is lower than a straight multiple of pay

Changing Pensionable Salary Definition
+ achieves the target explicitly for all members
+ can make any employee contributions definition clear
- exposed to changes in the State benefit e.g. on State pension age
- more difficult to understand for members
- not good for lower earners or part time employees
- members could loose out if their contributions are related to full salary but the pension is lower than a straight multiple of pay

[13]

A8

(i) **Generic comments**
- Decrease retirement age
- Increase death benefits
- Reduce company future contributions
- Reduce member contributions
- Contribution holidays (for a specific period of time)
- Increase the accrual rate for past benefits
- Increase the pension increases in payment
- Grant one-off discretionary increases to pensioners and/or deferreds
- Adopt a more conservative valuation basis thereby increasing the value of the liabilities (decrease discount rate, increase salary growth, reduce mortality assumption)
- Where legislation allows; refund back to the employer
- a combination of any of the above

Examples
- member contributions could be reduced by 1% to use 500 million (or member contributions eliminated to use the full surplus), amortising the surplus over the future expected working lifetime of active members.
- equally, the company contributions could be reduced by 1%, using 500 million for each 1% reduction amortising the surplus over the future expected working lifetime of active members.
- accrual rate for actives for past service could be increased to 2% using 1,250

million; this would mean an increase in the standard contribution rate to 24%.
- based on a ball park of a 10% increase in post retirement liability for each change in net discount rate yield at age 60, one could use 250 million increasing actives' pension increases to 5%

(ii)

Legislation considerations:
- is there a requirement to use the surplus in a certain way such as
the categories of members to enhance first (like pensioners)
- the level of benefits to enhance before any surplus can be refunded to the employer
- is there a prescribed actuarial basis valuation that must be considered to show extent of true excess surplus before monies are returned to the employer
- what are there maximum benefits that employees can be provided before any adverse tax implications take place
- what is the maximum level of surplus allowed for the employer to continue to benefit from tax concessions of the retirement trust, any surplus above that should be considered to be used faster

Trust Documents
- The Trust Deed and Rules may specify how and in what priority any surplus is used
- It may also specify the decision making balance of power between the Trustees and Employer

Employer motivations
- The employer will not want to use the surplus to the extent that it is then introduces an unacceptable level of risk for future obligations
- it would prefer to do one off enhancements than fundamental improvements to the scheme design and,
- a reduction to contributions would be preferred than benefit improvements
- there may be human relation motivations to ensure that member's benefit in someway

Source of surplus
- as the employer sponsors the scheme it can claim it should benefit from the surplus
- the employer may be more open to using the surplus that has occurred from an identifiable special one off event such as a large reduction in workforce giving rise to withdrawal gains
- as this scheme is member contributory, the member's could claim that they also have a fair claim for any surplus by a way of reduced contributions or benefit improvements
- if allowable, deferred members may be excluded from any enhancement to benefits as they no longer work for the company and the employer would rather direct such improvements to existing staff

Speed of using the surplus
- a balanced decision will have to be considered in how much of the surplus used each year
- one-off improvements use the surplus immediately but reduction in contributions mean it is used over a longer period of time and thereby is a more prudent approach
- One should consider how much prudence is built in to the valuation basis, thereby

gauging how much true surplus there is. Sensitivity analyses should be done to ensure that any use of the surplus does not unduly cause additional future risk on the security of the benefits.

[15]

A9

(i)

Domestic equities

a. Real investment – good match for liabilities linked to salary or price inflation
b. Marketable (at least for most quoted companies)
c. Short term volatility in market value and income stream
d. Long term steady real growth – historically this sector has given good returns
e. Can obtain a well diversified equity portfolio
f. Dealing costs are usually fairly low
g. A significant portion of the return comes from capital growth rather than dividend income

Domestic fixed interest stocks

- Marketable (government stock readily marketable)
- Government stock very secure in nominal terms (low risk of default)
- Lower expected return than equities
- Likely to have wide range of investments – can construct diversified portfolio
- Dealing costs low (particularly for government stock)

Index-linked government stock

- Marketable
- Secure in real terms
    - Guaranteed if held to redemption
    - Good for inflation-linked pension liabilities
- Range of investments may be more limited than fixed interest
- Provides diversification from equities although equities expected to provide higher return over the long term

Property

- Expected real return in the long term (assuming regular rent reviews)
- Gives diversification from equities
- Relatively poor marketability and liquidity
- Direct holdings are not possible/ practical for smaller schemes
- Higher management and dealing costs

(ii)

Domestic equities

Although this sector is expected to provide the best long term returns, short term fluctuations (mainly in market value) may cause the scheme problems, for example:

- when securing the pension or providing tax free lump sum at retirement
    - think about a gradual switch out of equities into gilts and cash as each member approaches retirement to match/maximise benefit outgo
- when there is significant benefit outgo eg redundancies or death
    - however it is difficult to predict redundancy requirements much in advance
    - consider insurance to minimise the death risk

Domestic fixed interest stocks
Although a good match for pension/annuity rates, these are poor match against inflation.
The trustees should consider actively managing their investments with regard to the period up to retirement:

- longer period: equities expected to provide better returns and inflation protection, short term volatility less of a concern
- shorter periods: consider moving into gilts and cash as retirement approaches

In following this strategy the trustees accept that members close to retirement lose the potential upside of the equity market in capital terms but protect against the effect of a potential downturn in terms of :

- mismatching annuity rates and
- protecting the amount of cash to be taken as a retirement lump sum

Property
Marketability, liquidity and size of holdings mean that pooled funds are the sensible medium for property exposure for smaller schemes, particularly a scheme like this in its infancy.
Once the scheme has grown, if it reaches a sufficient size to invest directly, property values need to be monitored closely
A particular problem with property is that its subjective valuation will make it difficult to determine a fair price for those wishing to buy or sell property units.

Asset allocation
The trustees should look at the membership as a whole regularly. Those approaching retirement should also be closely monitored. The trustees and advisers need to balance the mix of equities, gilts and cash as matching of the age/liability profile takes place.

General
Cashflows should be managed efficiently. Most money purchase schemes such as this are unitised for ease of administration. The trustees/administrator/investment manager should try to ensure matching of buying and selling units to minimise costs and hence maximise investment return.

In order to ensure that members are provided with competitive benefits at retirement, the trustees should consider using an authorised intermediary to obtain best advice when securing individual benefits on retirement or death.

[21]

Total Marks **[100]**

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