Actuarial Society of India

Examinations

May 2006

SA4 – Pension & Other Employee Benefits

Indicative Solutions

(Note: It is realized that there could be other relevant points with reference to the question and examiners need to take that into account while awarding marks)

Sol 1) (i) The issues covered in the report would be as follows:

1) Eligibility e.g., residency and/or occupational test
2) Funded or not; demographic factors/macroeconomics
3) Defined benefit or money purchase
4) If defined benefit, flat rate or earnings related?
5) Objective of pension – subsistence target?
6) Interaction with private provision/other state benefits
7) Potential to disincentivise existing private savings
8) One pension age or a range
9) Increases to pension, flat, increasing in line with price or earnings?
10) Include dependants benefits?
11) If money purchase, investment options and constraints
12) Investment mediums available and impact on Stock markets, Bonds etc.
13) Determination of contribution rates (for the members)
14) Cost to the government/sustainability
15) Tax treatment
16) Possibility of cash commutation option
17) Means testing of ultimate benefit
18) Extent, if any, to which past service credits could be given
19) Ability to transfer to other State savings arrangements, or to non-state schemes
20) How to communicate to people

(10)

Sol 1) (ii) Either similar or more tax advantages may be given to the new pension scheme than those that are available to the existing ones. The new scheme may be made more attractive by increasing the limit of tax efficient contributions/benefits.

a) Encourage infrastructure investment :

- By discouraging overseas investment – either don't allow overseas investment or put a ceiling or make investment return (income and capital gains) from overseas investment taxable at reduced/full rate

- Set rules for investment where a minimum investment, say 15% is made in infrastructure projects as well as in government bonds, say 40 to 50%

- Make investment income/gains from other investments (other than infrastructure and government bonds) taxable at reduced/full rate

- Ensure that there are enough scope for investment in infrastructure investments and government bonds to support demand

b) Higher paid :

- ✍ Exclude the higher paid from scheme membership
- ✍ Limit the pension based on earnings up to a cap
- ✍ Tax benefit may be allowed on contributions at a lower/basic rate of tax
- ✍ Taxing investment return on funds in respect of higher paid

c) Old age :

- ✍ Don't allow lump sum benefits from the scheme or let they be allowed after tax
- ✍ Require index-linked benefits so that value does not erode in older age
- ✍ Compulsory family pension
- ✍ Require a portion of the pension to be held back to cover any old age nursing requirements after a particular age, say, after 75 or 80 years

d) Physically crippled/mentally retarded dependents :

- ✍ Allow higher contribution (tax efficient) from people having physically crippled/mentally retarded dependants
- ✍ Special tax privileges may also be allowed to such people
- ✍ Government may also pay contributions (matching or otherwise) for the disabled dependent

(8)

Sol 1)(iii) Advantages :

i) Less or no reliance on budgetary provisions
ii) Higher pensions for future employees, if contributions are high enough and/or investment return net of expenses has been higher
iii) Future employees will find their pension pot visible and secure
iv) Capital generation for long term & infrastructure investment in India

Disadvantages:

i) Transitional period – the period during which government will need
- to pay pension in respect of retired employees
- to pay pension for existing employees as and when they retire/die/leave etc. and also will contribute for new employees
  This will require the government to raise extra tax

ii) Lower pensions for future employees, if contributions are lower and/or investment return net of expenses has been low
iii) Issue is politically sensitive
iv) Defined contribution scheme introduces uncertainty
v) Defined contribution benefits may please some and not all
vi) Lack of general financial awareness and investment of employees may create significant problems associated with the communication of investment advice

vii) The government may have to create a compensatory scheme to provide ultimate security for the funded pension
viii) Government will have to come out with extra regulation

(6)

Que 1) (iv) Following approaches may be adopted by the government/regulator to maximize the security of benefits under the new scheme:

i) Requiring regular disclosure to the potential recipients of the adequacy of funds and the ways in which these funds are managed and invested
ii) Restricting the types of investments that can be used for funds
iii) Requiring regular checks of the adequacy of separated funds
iv) Requiring authorization of the fund managers
v) Requiring a minimum quality of advice from advisers to the members particularly where investment choices to members are given
vi) Restricting charges/expenses of record keeping agency/fund managers
vii) Requiring financial guarantees, if possible
viii) Placing outstanding benefit obligations as a high priority debt in the event of insolvency of a fund manager
ix) Requiring insurance against inadequacy of funds in the event of insolvency, negligence, fraud etc. of the fund manager
x) Requiring minimum credit ratings of the fund managers

(6)

Sol 1)(v)

The GN 20 covers SSPs having the following attributes:

a) Prescribed by legislation such as Employees State Insurance Corporation, Social Security schemes for specific class of a population set by Central or State Governments.
b) Covering a defined wide population, generally on a compulsory or automatic coverage basis.
c) The benefits provided by the SSP are generally payable in respect of one or more of the following :
old age, retirement, death, disability, invalidity, survivorship, health, sickness, maternity, unemployment, work-related injuries
d) Programs specifically sponsored by a government or a quasi-governmental organization as an employer for its employees.

Type of actuarial work:

Following actuarial work is covered by the GN:

- Actuarial reports on the projected financial status of an SSP or equivalent reports
- Statements of opinion, papers or presentations on SSP policy matters, such as the adequacy of contributions and/or benefits relating to the existing provisions, or proposals for changes therein, or establishment of a new scheme.

Contents of actuarial reports:

1. Executive Summary

It may cover the purpose of report, key assumptions, results & conclusions.

2. Introduction

a) To whom the report is addressed
b) Identification of the SSP under review
c) The purpose of the report, including a reminder that projections are dependent upon the underlying data, methodology and assumptions
d) The starting and ending dates of the projection period
e) Reference to the relevant preceding reports
f) Contemplated date of next report

3. Description of the provisions of the SSP concerned

Report should include a description of the provisions of the programme that are materially relevant to the projections, e.g. coverage, financing, benefits etc.

4. Data

- ✍ Describe the relevant data used for demographic and financial projections.
- ✍ Comment on the sufficiency and reliability of data. If data is insufficient, then mention so in the report including consequential limitations of the results.

5. Assumptions

Describe all the assumptions (demographic and financial) assumptions used for projection including their rationale.

6. Methodology

Description of methodology with sufficient information for another actuary or other person to assess the results of the report

7. Results

The actuarial report should include all results of the demographic and financial projections that are relevant to the purpose of the report.

Most of the results would normally be found in either of the following two areas of the report:

Sections on data, methodology and assumptions

a) Population by age groups and sex and in total
b) Dependency ratios
c) Employment earnings by age groups and sex, and averages
d) Contributory earnings by age groups and sex, and averages
e) Pensionable earnings by age groups and sex, and averages
f) Covered payroll and workforce by sector of economic activity

Section on cash flow financial projections

g) Contribution rate
h) Pay-as-you-go rate, if applicable
i) Contributions
j) Investment earnings, if funded
k) Other income
l) Total income
m) Benefits
n) Administrative expenses
o) Total expenditures
p) Assets

The results should also make clear whether and to what extent expenditure other than benefits has been included and this expenditure should also be taken into account in the statements about adequacy of contributions.

Irrespective of the financing method, the results shown should include a summary of the income, expenditure and assets of the program by calendar and/or fiscal year, or by other suitable intervals, in respect of both the past experience of the program and the projection period. The results should be shown as real values and, when needed, also as nominal values, or the effect of inflation should be shown in some other appropriate way.

8. Analysis of projection results

The report should present an analysis of results along the following lines :

a) ***Sensitivity analyses***, showing the effects on the main projection results of variations in key assumptions. The corresponding auxiliary results can also serve as a basis for deriving a reasonable approximation of the projected effect of changing in the values of one or more of the key assumptions.
b) ***Reconciliation*** with the previous report along with explanations of significant changes in results.
c) ***Explanations*** of the pattern of financial projections over the years (ageing of the population, maturing of the program, recent changes in the program financing or benefit provisions, etc.) and the implications thereof.
d) ***Effect***, if material, on the financial projections of events subsequent to the beginning of the projection period.

9. Conclusions

10. Attestations

11. Actuary’s name, signature, position held and date

(20)

Sol 2.1 (a) Best Estimate

An actuarial assumption which the actuary believes has an equal probability of under- or over-stating the future experience (ie the median of the distribution of future experience)

(1)

Sol 2.1 (b) Projected Accrued Benefits Funding Method

The Projected Accrued Benefits Funding Method is specified in Pension Scheme Surpluses (Valuation) Regulations 1987 (of UK) and relates to the calculation of Actuarial Liability as at the valuation date. The Actuarial liability for active members, taking assumptions as specified in the Regulations, is calculated as for Projected Unit Funding Method where in the actuarial Liability is the discounted value of the benefits that have accrued over the past period of membership of the beneficiaries. In determining this value allowance is made for any future expected inflationary growth of the on-going benefits up to retirement age.

(2)

Sol 2.1 (c) Defined Accrued Benefits Funding Method

The Actuarial Liability for active members either as at the valuation date or as the end of the Control Period is calculated on the assumption that the scheme will be discontinued on those dates. As with other methods, the Actuarial Liability is normally assessed on the basis of actuarial assumptions consistent with those used for long term funding. It is assumed that members will be entitled to the discontinuance benefits which are defined in the rules of the scheme before reduction of benefits under the application of any priority rules in a fund with a shortfall in assets. Additionally (but not alternatively) calculations may be made which assume that members will receive higher discontinuance benefits, by exercise of discretion, and both the Actuarial Liability and the Standard Contribution Rate would then be calculated by reference to those higher benefits.

(2)

Sol 2.1 (d) Attained Age Funding Method

The Standard Contribution Rate is determined as the contribution rate which, if paid over the expected future membership of the active members, would provide for the expected benefits payable in respect of them arising, from their future service. The value of the future service benefits is taken as the difference between the value of total benefits and the value of past service benefits calculated as for the Projected Unit Method. This results in the Attained Age Method and the Projected Unit Method having the same Actuarial Liability but different Standard Contribution Rates.

(2)

Sol 2.1 (e) Current Unit Funding Method

The Actuarial Liability for active members is calculated taking in to account all types of decrements. In calculating the Actuarial Liability as at the valuation date pensionable pay is not projected. In calculating it as at the end of the Control Period, pensionable pay is projected to that date. In such calculation, allowance is made for increases in the benefits between the relevant date and the assumed date of

retirement, date of leaving service or date of death as appropriate. The increases to be included are those applicable to preserved pensions as required by the legislation or rules of the scheme, as the case may be.

(2)

Sol 2.1 (f) Entry Age Funding Method

The Standard Contribution Rate is determined as the contribution rate which, if payable over the expected future membership of a group of new entrants, would provide for the total expected benefits payable in respect of that group. The method does not define the group. For example it could be group consisting of current entrants to the scheme or the entrants who gave rise to the current active members. A single average age of entry or a distribution of ages could be used. Alternatively the Actuarial Liability could be calculated individually for each active member.

(2)

Sol 2.2)

The key considerations that need to be taken in to account while designing an Employee Benefits Scheme including the objectives that the Employer may have for the same.

Key considerations in designing employee benefit scheme;

1) Laws/Regulations governing such schemes,
2) The incentives such as tax to the employer and employees,
3) Needs of the beneficiaries/recipients of the benefits,
4) Cost constraints of the employer,
5) The events giving rise to benefits,
6) The form of the benefits

The Objectives of the employer while designing an employee benefit scheme;

1) The objectives will reflect culture of the Company and needs and priorities of the employer as well as the employees.
2) The benefits should be attractive to employees and potential employees.
3) The benefits should be at an acceptable level of cost which should be stable in long-term. Such cost considerations include the tax concessions under applicable tax laws and the cost associated with administration.
4) Cost savings related to better industrial relations and support to employment policy.
5) The benefits and related cost considerations may be different for different groups of employees.
6) The scheme aside from retirement benefits may have other benefits such as benefits on death, illness and leaving service.

(6)

Sol 2.3)

Comparison of various aspects of DB and DC schemes from the perspective of the Employer and the Employees:

The following table summarises the points in respect of DB and DC from perspective of the employer and the employee:

Employer;

Defined Contribution	**Defined Benefit (eg final salary)**
+ Costs directly controlled	+ Employer's contribution policy is

	flexible
+ Fewer legislative/regulatory compliances	+ Can aid employment policy, i.e. say redundancy augumentation.
- Little contribution flexibility	+ Administration cost per member is lower.
- Vulnerable if resulting benefits are poor	- Required to comply with more legislation/regulatory compliances and hence more costs
- Will require systems in administer individual member funds resulting in to higher per ember costs	Costs vary according to scheme experience largely outside the employer's control.
Not exposed to investment risks and consequently not benefited by investment rewards	Employer bears investment risk and consequently could be benefited bu investment rewards.

Employee;

Defined Contribution	**Defined Benefit (eg final salary)**
+ Potentially larger benefits for early leavers.	+Provides predictable benefits in terms of salary and service.
+ Flexible form of benefits.	+ Benefits for high fliers reflect promotion and merit salary increases.
+ Easier for employees to understand and appreciate the value of benefits.	- Possible poor benefits to early leavers due to break with future salary growth on exit.
+ Potentially wide investment choice and control.	- Little flexibility in form of benefits provided.
- Benefit varies and can not be defined in advance.	More difficult for employees to understand and appreciate.
Benefit from exposure to good/poor investment return.	-

(6)

Sol 2.4 (a):
Difference between Experience Rating and Profit Sharing;

Experience Rating: This is generally used to refer to the use of the scheme's past mortality experience in deciding whether it is appropriate to adjust the unit rate up or down from that derived using standard rates of mortality.

Profit Sharing: This is used to refer to the situation in which the insurer will take account of scheme's actual mortality experience during a year of cover. A scheme that has made little in the way of claims would receive a year end premium refund, whilst a scheme that has made higher than expected claims may be required to pay an additional premium.

Advantage and disadvantage of group life cover to the Employer;

For all types of insurance, the main attraction of a group life insurance is that there is greater predictability of cost – the premiums are known, whereas the cost of providing the death benefit is uncertain. There is significant potential for large variability of death-in-service cost in an uninsured scheme, in both amount and timing, particularly for a small scheme.

The main disadvantage of insurance is that in the long run the insurance company will need to charge sufficient premiums to cover its expenses and to make a contribution to profit, as well as covering the actual costs of the benefits paid.

(5)

Sol 2.4 (b)

Issues that the Employer/Trustees should consider while deciding whether to insure or not an Employee Benefit Scheme;

Whether to insure or not is an investment decision for the trustees and they should be mindful of the obligations under the Trust Act which requires them to act as prudent person. The decision should be taken in consultation with the employer who meets the cost of insurance premium and/or the death benefits.

In deciding whether or not to insure a particular benefit, the trustees of a pension scheme should consider the following;

1) Is insurance available?
2) How certain is the cost of benefit? If it is certain, then all the scheme needs to do is pay the cost. If it is uncertain, how much is it likely to vary?
3) If the cost is uncertain, how serious is it for the scheme if the cost is larger than expected? If the consequences are serious, the scheme is much more likely to insure than if the result of an excess cost is minor.
4) If insurance is available, how expensive is it? The relevant cost comparison here is of insurance premium with the expected cost of the benefit together with the perceived value of reduction in volatility.

(8)

Sol 2.5) Issues on which opinions might differ between the Seller and Purchaser companies;

1) Suitability of funding methods and assumptions.
2) The ownership of a scheme's surplus assets.
3) The responsibility of financing any asset shortfall.
4) The treatment of benefits accruing and those becoming payable during the participation period.
5) The interest to be added to allow for any timing differences between completions a payment.

(4)

Sol 2.6) for determining the transfer values from one to another fund, the factors that both the sides need to agree on;

1) The Calculation method to be used to fix the transfer amount
2) The actuarial assumptions to be used for applying the calculation method.

The Calculation method: The transfer payment often seeks to recognise the full value of the members' accrued entitlement to benefits in respect of completed service including allowance for projected salary increases. This leads in many cases to the transfer of accrued liability or past service reserve, i.e. the Actuarial liability under the Attained Age and Projected Unit Funding Methods. This method is often referred to as the "past service

reserve" and is usually consistent with the calculation method adopted for the ongoing valuation of the scheme.

The Actuarial Assumptions : Occasionally, a bulk transfer value is calculated as the value of benefits assuming all the members leave service on the transfer date. In this case assumptions appropriate to deferred pensioners would be used with allowance for revaluation of deferred pensions rather than future salary increases. This method typically produces lower values than the past service reserve and is unlikely to meet the objective of providing effective continuity of service on an identical benefit structure unless the buyer's scheme is prepared to enhance benefits to a higher level than that secured by the transfer value.

(4)

Sol 2.7)
Various issues and the manner in which these could be addressed to while apportioning shares of DB schemes Trust Funds;

1) The parties to the Sale and Purchase may wish to take account of the state of funding of the Seller's scheme in determining the transfer amount – This may simply follow a desire to pay as little, or receive as much, as can be justified by the Companies' advisors.
2) The seller may wish to avoid having to make good any deficit through a shortfall payment from its own resources. To do so the seller may try to set the bulk transfer payment as the lesser of the value of the accrued benefits and the share of the scheme's assets attributable to the transferring members. This would avoid worsening the security for the remaining members but without requiring extra contributions by the seller.
3) The buyer on the other hand may seek to obtain the greater of the value of accrued benefits and a share of fund so as to secure a portion of any surplus for the benefit of the transferring members. It is also possible that the Trustees of the seller's scheme may want to pay a share of the fund even when this exceeds the value of the accrued benefits.
4) The Trustees of the Seller's scheme are likely to be prevented by the terms of the trust deed and the rules from transferring any more than a share of the fund.

(6)
[50]