Institute of Actuaries of India

Subject SA4 – Pensions & Other Employee Benefits

14th May 2007

INDICATIVE SOLUTION

Introduction

The indicative solution has been written by the Examiners with the aim of helping candidates. The solutions given are only indicative. It is realized that there could be other points as valid answers and examiner have given credit for any alternative approach or interpretation which they consider to be reasonable.

Arpan Thanawala
Chairperson, Examination Committee

Indicative Solution

Note:

1. The solutions given are only indicative. It is realized that there could be other points as valid answer.

2. Some of the questions ask "discuss", "describe" or some other form of answer as against only "list". The answer should therefore be in the form as required by the question. However indicative solutions contain only points and the student will secure marks for the points contained in the answer though will miss out some marks for not answering the question in the form as wanted.

A.1. a) Overall

Under a DC scheme it is the member who takes the risk whereas under a defined benefit scheme it is the company.

In a defined contribution scheme, if experience is favourable the member benefits with a larger pension and if experience is worse than assumed the member receives a lower pension.

Company ABC

The funding basis for the defined benefit scheme was a global rate for all members based on an average of individual rates.

DC schemes are individually funded i.e. there are no cross subsidies.

Assuming a positive investment return relative to salary inflation it costs more to provide the same pension accrual for an older person because there is less time to invest money.

People currently retiring are likely to have been older than the average age of the scheme when the change was introduced and therefore they would expect to be underfunded.

The funding method for scheme might have been Projected Unit.

This means only funding for one year's accrual with no allowance for ageing because valuation method assumed a flow of new entrants.

The contribution rate for the defined benefit scheme was a combination of a future service rate and an adjustment for a past service surplus/deficit.

The contribution rate being paid at the date of the switch might have been less than the future rate because a surplus in the scheme was being used to reduce the rate.

Benefits taken under the defined contribution scheme may be in a different format e.g. the pension may include pension increases after retirement where none were provided in the defined benefit scheme.

Company XYZ

This is most likely due to actual experience being more favourable than was assumed when the actuary set the age related rates.

The benefits may also not be in the same format as the defined benefit scheme.

For example the member may be single and not purchasing a spouse's pension

Not including a guarantee period or not including pension increases.

Experience

Actual experience may have been worse than what was assumed in the funding basis of the defined benefit scheme for company ABC and better than the actuary's assumptions used for calculating the rates for company XYZ.

Investment returns have been different from those assumed due to economic conditions.

Alternatively in Company ABC members may have chosen to invest in lower risk investments whereas in Company XYZ members chose riskier investments.

Salaries will have increased at a different rate from what was assumed. The funding basis for Company ABC may have allowed for decrements before normal retirement date e.g. withdrawals, death which are inappropriate when funding an individual case.

The cost of purchasing a pension may be different from that originally assumed.

Due to changing interest rates and annuity terms e.g. insurance company expenses.

In Company ABC the member may be married whereas funding assumed a proportion married.

The age of spouse may be significantly different from average age assumed in funding.

Expenses and/or life insurance costs may have been treated differently in the Company ABC defined benefit scheme from how they are treated in DC scheme.

b) i) Assumptions

There are some general key points:

- 5 years is a fairly short time horizon and so the current economic situation and short-term outlook is highly relevant.

- Mr Ramesh may change his investment strategy up to retirement. Although he has stated continuing investment in the (predominantly equity) life office's unit-linked growth oriented schemes, approaching retirement may cause him to move towards asset classes that match his selection of retirement benefits, i.e. cash for cash and fixed interest gilts for pension purchase.

- Discuss these aspects with Mr. Ramesh, especially his attitude to risk.

- The choice of investment return, salary growth and price inflation assumptions must be consistent with one another.

Price inflation:

- Reflect short time horizon and current economic conditions.

Pre-retirement investment return:

- Reflect 5 year view.

- Take into account any change in member's investment strategy.

- Reflect investment strategy of underlying funds chosen by Mr. Ramesh

Expenses:

- Allow for expenses explicitly and not by taking a relatively arbitrary margin in the choice of interest rate (as often done in large scheme valuations)

- Allow for any likely increases.

- Further these may vary with investment choice

Post-retirement investment return:

- Reflect insurance company terms as pension will be bought out

- Annuity rates are volatile

Salary growth:

- Need to discuss with Mr. Ramesh

- Consistent with general economic assumptions over the next 5 years

Pre-retirement decrements:

- Nil: assume Mr. Ramesh survives to age 60 and retires at age 60

Post-retirement mortality:

- Consistent with tables used by insurance companies when setting their annuity rates.

Dependants:

- None

b) ii) **Likelihood of retiring with desired benefits**

One area for Mr. Ramesh to consider is the effect of investment strategy up to retirement on the likely level of retirement benefits.

In particular, we should review the effect of changes in asset values relative to:

- cash (for the portion for the tax-free lump sum)
  - risk of a fall in asset value on cash benefit
- annuity prices (for the portion of the fund to buy a pension)
  - risk of a change in asset value that differs to any change in the price of annuities

In general equities are expected to provide the higher return, although with volatility in market value.

Gilts are expected to match changes in annuity prices.

Cash offers relatively low returns but no falls in market value.

Illustrate a couple of simple options, e.g.

- Maintain 100% in unit-linked scheme up to retirement (where majority is held in equities)
- Move immediately to a strategy that fully matches the chosen retirement benefits, eg. 67% gilts and 33% cash
- a gradual switch from current strategy to a matched position at retirement

For each investment strategy, look at the effect of variability in the returns of particular markets, i.e. the equity market and the gilt market in simple terms.

- Assess the impact on contribution levels needed to be made by him to achieve the desired level of benefits.
- And the likelihood of maximum contribution levels (currently limited up to Rs.100,000/- for tax purposes along with other tax efficient savings) preventing the target from being achieved, unless the member wants to exceed the limit of Rs.100,000/-

- Assess the impact on benefit levels if a particular level of contributions is maintained.

These illustrations will show Mr. Ramesh the likely contributions we expect to be necessary to achieve his desired benefits. They will also show how dependent the benefits are on investment return (and hence investment strategy) and annuity terms at retirement. These are important features of a defined contribution provision.

It is important to discuss the results of these illustrations with Mr. Ramesh to check his understanding, which then may influence his decisions about investment choice, contribution levels, retirement age etc.

c) i) AL and SCR

$$\text{AL as at 31.3.2006} = 10 \times 26 \times \frac{15}{26} \times 13{,}000 \times \frac{(1.05)^{10}}{(1.06)^{10}} = 1{,}773{,}653$$

$$\text{SCR} = \frac{10 \times 1 \times \frac{15}{26} \times 13{,}000 \times \frac{(1.05)^{10}}{(1.06)^{10}}}{0.01 \times 10 \times 13{,}000 \times 12 \times a\,\Pi}$$

$$= \frac{68{,}217}{15{,}453} = 4.41\%$$

Where $a\Pi$ is one year annuity certain calculated at an interest rate of $0.9524\% = \frac{(1.06)}{(1.05)} - 1$

c) ii) AL as at 31.03.2007

1st method :

$$\text{AL} = 9 \times 27 \times \frac{15}{26} \times (13{,}000 \times 1.08) \times \frac{(1.05)^9}{(1.06)^9}$$

$$= 1{,}807{,}349$$

2nd method :

$$\text{AL} = 1{,}773{,}653 \times \frac{9}{10} \times 1.06 \times \frac{(1.08)}{(1.05)} + 9 \times 4.41\% \times (13{,}000 \times 12 \times 1.08)$$

$$= 1{,}740{,}409 + 66{,}870$$

$$= 1{,}807{,}279$$

The small difference is simply due to rounding.

c) iii) Analysis of surplus

Assets as at 31.3.2007

$$= 1{,}800{,}000\,(1.075) - 26 \times \frac{15}{26} \times 13{,}000 \times (1.075)^{3/4}$$
$$+ 9 \times 4.00\% \times (13{,}000 \times 12) \times (1.075)^{1/2}$$
$$= 1{,}935{,}000 - 205{,}869 + 58{,}228$$
$$= 1{,}787{,}359$$

Surplus as at 31.3.2007

$$= 1{,}787{,}359 - 1{,}807{,}349$$
$$= -19{,}990$$

Sources of surplus

Investment return

Higher than expected return would have positive contribution

Investment surplus $= 1{,}800{,}000 \times (1.075 - 1.06)$
$- 195{,}000\,\{(1.075)^{3/4} - (1.06)^{3/4}\}$
$+ 56{,}160\,\{(1.075)^{1/2} - (1.06)^{1/2}\}$
$= 27{,}000 - 2{,}158 + 408$
$= 25{,}250$

Initial surplus

Initial surplus as at 31.3.2006 was 26,347 (1,800,000 – 1,773,653). This will contribute positively to the surplus as at 31.3.2007

Surplus brought forward = 26,347 x 1.06 = 27,928

Salary inflation

Higher than expected salary rise would make negative contribution

Salary surplus = 1,807,349 x [1.05/1.08) – 1]
= - 50,204

Contribution paid

Surplus/deficit will arise from the following :

- less than required contribution – deficit
- contribution based on old salaries – deficit
- early payment of contribution – surplus

Contribution surplus

= [{4% x 9 x 13,000 x 12 x $(1.06)^{1/2}$} – {4.41% x 9 x 13,000 x 12 x (1.05)}]

= 57,820 – 65,012

= - 7,192

Deaths

No death was expected. More than expected deaths would be a source of deficit as death benefit > reserve held

Reserve held at 30.06.2006	=	$\frac{1,773,653}{10} \times (1.06)^{1/4}$
	=	179,968
Death Benefit	=	195,000
Death Surplus	=	(179,968 – 195,000) $(1.06)^{3/4}$
	=	- 15,032 x 1.04467
Total	=	- 15,703

Surplus = 25,250 + 27,928 – 50,204 – 7,192 – 15,703

= - 19,921 (As expected, subject to rounding error)

Note: It is appreciated that there could be valid points not included in the indicative solutions and examiners shall keep this in mind while evaluating the answer scripts.

[50]

A.2. (a) **Advantages and disadvantages of merging the four schemes in to one single scheme.**

The first step for the US Company is to decide whether they want to harmonise the four companies themselves. This will depend upon their business strategy in purchasing the four Indian companies within the same industry.

There are a number of advantages to be gained from merging the four pension schemes within the India operation;

Avoidance of duplication in:

- One trustee body, hence one set of trustee meetings.
- One set of accounts, legal documents, administration unit, actuarial valuation and similar works.

The are potential savings, in terms of ongoing actuarial, auditing, legal and administrative expenses as a result of day-today operation of one scheme, which will be less time consuming.

Employee mobility within India operations:

Employees moving from one Company to another within the four, assuming the four continue separate operations, will not have to change pension scheme. If an employee moves within the group, it would be advantageous for their pensionable service to be continuous. Operating one scheme facilitates this.

The US parent Company appears to be looking for a uniform culture, eg by wanting to offer a common pension package worldwide.

A group identity can be particularly important in relation to newly acquired companies.

Funding may be simplified and security enhanced:

It is assumed that all the four schemes are approved superannuation and thus funded, however, the schemes being final salary, it is not known if the solvency status of all the four is sound and at the same level. Merger can help enlarging the base and thus stabilizing the contribution rate.

There is a possibility that the contribution rate may be different for the four schemes and thus the merged scheme can provide an opportunity to have same level on contribution for the same type of benefits, the industry being the same resulting in to greater employee satisfaction.

A larger scheme may result in greater security in funding terms and lover volatility in the contribution rate resulting in better financial and cash flow management.

Employees may feel that they have a greater security as a member of a large group, however this may be more of a perception rather than real advantage.

However disadvantage of the merger is that unless the contribution level and benefits levels are same in all the four merged entities and expensing under AS 15 has been consistent, the financial adjustments within the four companies could be complicated.

Investment opportunities:

Schemes may move from “scheme of insurance” to self management under Rule 67 in Income Tax Rules 1967 or vice-versa and increase in the size of the funds as a result of amalgamation will provide opportunities of economies of scale and improved returns.

Due to larger combined size, the scheme may benefit from better terms under “scheme of insurance” to be negotiated with life insurers.

However there may be surrender penalties under “scheme of insurance” contracts and these penalties may be better negotiated for a combined larger size fund.

Benefit improvements:

The merger may result in benefit improvement for some members as the US parent Company is proposing across the board better benefit structure. There is possibility however of members of one or more of the earlier schemes getting some where less as a result of merger/restructuring. [0.50 marks]

There could be disadvantages of merger in to one scheme;

The time and cost of merger itself:

The merger will involve legal (deed of variation, Income Tax approval and alike) and admin cost such as taking consent from and communication to members.

Areas of detailed attention in particular;

- Trustee responsibilities under Indian Trust Act and, their constitution (representing the four entities), their training and other similar issues.
- Approval from Income Tax Authorities and integration issues with EPS, ’95 if any.

- The physical transfer of assets, investment management issues, actuarial advice on amount of liabilities for funding.
- Accounting issues under AS 15 (rev. 2005).

A single structure may not satisfy the varying needs of the membership of the four Companies:

There may be different benefit structure even though the four companies are in the same industry for reasons such as one or more of them may be only manufacturing and others sales/marketing.

The proposed single benefit structure whether under one merged structure or separate may not be attractive as compared to competitors leading to recruitment and retention issues.

(b) The proposal for providing the same benefits as the US scheme together with any amendments that you may suggest keeping in view the Indian Laws/regulations

General points on US/India design:

The Indian Tax and other laws (such as EPS '95) are very different to those applicable in US and this makes straightaway adoption of US benefits structure difficult.

As against India where just all approved Superannuation schemes are under Trust, in US this may not be so. Though it is not known if the existing US arrangement is under Trust, however this aspect needs explanation to US decision makers.

The Indian schemes being final salary are presumably DB, however it is not clear if the US scheme is DB or DC. For variety of reasons in India, particularly the multinationals, are opting for DC. This aspects needs to be addressed to.

Arrangements are influenced by differing culture, socio and corporate of US and India. There are diverse arrangements for employees to receive different levels of income in different forms and probably sources. For example what constitutes CTC may be different for different categories of employees. Integrating this aspect with US benefit structure may have issues to be addressed to.

The Indian and US employers will have different needs even if the schemes are wholly funded by the respective employers.

Design of benefits – general issues:

The information given in the question does not show up if some Indian benefits incorporated under approved superannuation schemes have EPS, '95 component.

The new unified benefit structure may therefore be of very different significance in some aspects for members. Members who may be or may perceive to be worse off may need to be managed.

In view of the above it may not be possible to modify the accrued/vested benefits leading to two structures; for pre-US take over and new employees.

Key aspects of current India benefits are;

Death –in-service, lump sum and spouse's pension.

It is a common feature at least so far and is arranged along side the superannuation benefits. Being part of the same transaction with the life insurer, if "scheme of insurance" is negotiated, the deal turns out to be low cost. The lump sum death benefits attract no tax, whether part of the trust arrangement or not.

Death after retirement – spouse's pension

Normally expressed as a percentage of member's pension so far has been part of standard design. Under current trends such choices are left to be exercised when pension falls due to begin.

EPS, '95

The Employers falling under provisions of Employees' Provident Fund and Misc. Provisions Act 1952 (PF Act) are mandated to be covered under EPS, '95 as well. There is no information whether some or all or none of the four existing Indian Companies fall under PF Act. If they do, the integration of US proposed benefits with EPS, '95 needs to be considered carefully particularly when the US parent Company may not want to provide pensionary benefits under structure where EPS, '95 becomes top up.

Commutation benefits or Retirement tax-free lump sum

Indian Income Tax Act permits tax-free commutation of pension up to 1/3 (when Gratuity is provided) and up to 1/2 if no gratuity provided. Such benefits are opted invariably by all the members.

Income Tax limits on contributions and Service Tax implications.

The Income Tax Act 1961 puts a limit on employer contribution (as of now 15%) as a percentage of salary to an approved superannuation scheme/fund. It should be examined if the proposed benefits structure could be funded within this limit. If not then there could be tax implications. Similarly implications of fringe benefit tax on the employer contribution needs to be examined for implied additional cost (to the employer) perspective.

Normal Retirement Age

For EPS, '95 the retirement age is 58 years (for inception of benefit but not necessarily retirement from employment) and for approved superannuation such age needs to be specified as well as early retirement age. The US benefits structure makes both the ages flexible based on other parameters. The Income Tax Authorities may not approve of such arrangement.

Maximum Pension

The US structure is rather too complicated to be viewed favourably for approval by Income Tax Authorities, though there is no upper cap on the pension as of now. Aside from this aspect, understanding the structure by members may not be easy leading to avoidable member querries.

Ill-health pension

From the current Income Tax approval requirements there does not appear to be any issues.

However the employees may want the pension to be based on notional service till normal retirement age and also pension to the spouse on death needs to be structured carefully.

Design of benefits – specific issues

Eligibility

Compulsory membership though not illegal in India, may not be favourably taken by new employees. It is not known what kind of industry, the Indian Companies are in but if the employee turn over is high, they may not prefer to join and instead prefer equivalent lump sum.

Normal Retirement Age

Though there is no law requiring specific normal retirement age prevalent employment practice is to specify an age. The current US formula is unlikely to be tenable in India.

The current US structure will look unfamiliar and complicated to employees in India and in any case the existing employees are not likely to accept it.

The current US structure does have complication from actuarial valuation point of view and consequential cost.

Additionally from actuarial valuation point of view whether for funding or under AS 15 (rev. 2005), the current US formula will surely present avoidable complications, particularly if the four schemes are integrated. Aside from

calculation aspects, the understanding of financial numbers by Finance and Management may have communication issues.

Final Pensionable Salary

There is no mention of re-valuing the three highest consecutive years' salaries to allow for inflation. In India the employees generally would be comfortable with last year's or last three year's salaries. Besides highest three consecutive years' salary in order to be calculated will need records to be maintained and calculations performed. Even if advanced IT solutions may permit this, the employees need to be convinced for its accuracy with potential error leading to unfavourable consequences.

Vesting

The current practice in vogue in India in this regard needs to be examined in relation to what US current structure is but also the existing structure in the four companies. Though there are no regulations by Income Tax on this aspect, present day employees do not prefer long vesting period. If the new merged scheme at least for the new employees turns out to be DC, the employees may not want any vesting period at all. And if vesting period is introduced, they may prefer equivalent lump sum with tax consequences.

Integration of Vesting periods if different in the four existing schemes including with what is decided to be applicable to new employees will need careful handling.

If on merger DB to DC conversion issues are to be considered, the treatment of existing vesting period and thus rights vested as against for members having no vested rights will have financial implications not embedded in the current valuation of liabilities for funding (if done earlier) and for expensing.

(c) The parties involved in such a merger including their roles and responsibilities.

Trustees of all schemes including the new scheme

The Trustees role is laid down in Indian Trust Act and also and additionally incorporated in the scheme Trust Deed and Rules as approved by Income Tax Autrhorities. The Deed of Variation including the new rules need to be adopted by the Trustees and they hold legal responsibilities for the same.

Trustees need to consider security of the vested rights and equity amongst members and ensure members understand this.

Trustees need to avoid conflict of interest as reflected in their representing, say the sponsor and their duty to protect interest of member/ beneficiaries.

The US parent Company

The US parent company need to decide to the extent it should aim to standardize benefits across all jurisdictions keeping in view what is achievable within the framework of Indian Laws. Having done so, should then lead the whole process.

While doing so the parent company needs to ensure the employees understand the need for change resulting in motivated staff.

The Management

The role for management for each of the four Indian companies will be to protect their members rights and also ensure that their companies get fair share of the cost allocated under the new merged scheme. If the age/benefit profile of the four companies is variant from one an other, understanding fairness of the cost allocated (say uniform contribution rate) will need actuarial assistance.

Actuary's role

The Indian approving authorities under Income Tax Act do not insist upon appointment of an Actuary. However in practice Trustees do appoint Actuary and the same person then acts as Actuary to the sponsor. In the current case, it is likely the US parent company may appoint Actuary to advise on sponsor issues and encourage (should) Trustees to appoint separate Actuary to advise. This will avoid conflict of interest. The Sponsor Actuary will then also assist in drafting the communication document aimed at the members and will also advise on implications of AS 15 (rev. 2005). The Actuary advising Trustees will mainly focus on protection of members' rights and fairness/equity amongst members if there are changes in the benefits structure.

Legal Advisor

The Legal Advisor's role is to provide legal advice to the Trustees and/or Companies on legal aspects of the merger and best forward way as how to manage the legal risk (for example potential legal issue by employees).

With a view to avoiding conflict of interest there should be separate legal advisors to the Trustees and the Sponsor.

Employees/Members

The employees/members are affected directly by the merger. It is likely that existing pensioners (unless their pensions had been bought out from life insurer) and potential beneficiaries of existing pensioners will also be affected.

The Trustees along with the Management will need to involve members/beneficiaries in the merger process including obtaining their consents.

Approving Authorities

In India the provision of Retirement benefits is not regulated in the sense that the same are regulated in US. The Income Tax Authorities, however have requirements of approval if the scheme has to be an approved superannuation scheme. The new structure needs to be approved by them.

(d) A brief over view of Indian retirement benefits' legal and taxation regime

General

There is no regulatory regime (and thus no Law) to regulate provision of retirement benefits in India such as regulating the roles and responsibilities of the Trustees, the obligations of the sponsors, regulating the professional advisors such as Actuaries or Legal.

However there are Laws mandating provision of certain types of retirement benefits such as Provident Fund including EPS, '95 and Gratuity.

In respect of the above and also superannuation (pension) benefits the Income Tax Authorities regulate these schemes when funded and thus facilitating Tax efficiencies for employers as well as employees.

The Laws in respect of Provident Fund and Gratuity stand alone though the provisions in the Income Tax Act/Rules for approval of schemes of Provident Funds, Gratuity and Superannuation though specified separately have commonalities.

While Provident Funds in the nature of things are funded, the Gratuity could be funded or unfunded and approved superannuation schemes have to be funded.

For gratuity and superannuation the funding requirement is from the point of view of tax efficiencies, the funding level and solvency is not regulated.

The current question relates to only pension scheme thus implying approved superannuation fund, the US parent Company need to look at all types of retirement benefits together so as to get a holistic view of things.

Specific Retirement Schemes in India

Provident Funds;

Mandated under Provident Fund and Miscellaneous Provisions Act 1952 covers most of the employers as specified according to given criterion. All the

employers falling under the Act have to be part of Employees' Pension Scheme, 95 which as Defined Benefit final salary scheme. Though at moderate level, the scheme is very comprehensive.

Employers falling under the Act can be part of the centrally administered scheme by Employees' Provident Fund Organisation (EPFO) or can seek exemption and administer on their own (exempt Provident Funds)

Employers not falling under the Act or in respect of employees not mandated to be covered under the Act, can have a Trustee Provident Fund under approval of Income Tax Authorities (Excluded Provident Funds).

Gratuity

The Payment of Gratuity Act, 1972 mandates the specified category of employers to provide gratuity at least to the minimum as laid down in the Act.

The benefits are in the nature of lump sum payable on leaving service, death or Permanent Total Disability calculated as 15 days salary for each year of service.

The Act does not require the benefits to be funded but if funded under approval of Income Tax Authorities, there are tax efficiencies for the employer as well as for the employee.

Whether funded or not, actuarial report is needed for expensing under AS 15 (rev.2005).

Superannuation/Pension

There is no Law mandating or regulating such benefits, however if provided and income tax efficiencies are needed then Income Tax Authorities require the scheme to be funded and got approved by them as "approved Superannuation Fund".

The scheme could be DB or DC and as one of the requirements for approval the contribution is upper capped at 27% less employer's contribution to Provident Fund.

The Fringe Benefit Tax is payable on the contribution made by the employer under certain circumstances.

In respect of DB scheme, actuarial report is needed for expensing under AS 15 (rev.2005).

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