INSTITUTE OF ACTUARIES OF INDIA

Subject SP4– Pensions and Other Benefits

May 2024 Examination

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.

Solution 1:

i) Advantages of means testing

Means testing is a cost-effective way of targeting resources as it should avoid overprovision, ie it guarantees that everyone will achieve a certain standard of living, without unnecessarily raising the standard of living of those who are already adequately provided for. [1]

Means testing redistributes wealth (ie taxes are raised from those with more wealth/income, and benefits paid to those with little wealth / income) and thus targets benefits to those in greatest need. This meets some people's perception of fairness. [1]

Disadvantages of means testing

The major drawback with means testing is that it can provide a disincentive to save, ie it may discourage people from providing for themselves. [1]

In particular, it may encourage people to squander existing wealth so that they meet the means test. [1]

Means testing can create a poverty trap whereby increases in a person's income (or assets) merely reduce the value of state benefits. This is an additional disincentive effect. [1]

Means testing may be seen to be too redistributive. [½]

Whilst means testing does in theory lead to more efficient targeting of resources, the more complicated the rules, the more onerous and hence expensive it will be to administer. [1]

Rules will be needed, and those most in need are usually those who will find it most difficult to understand the rules. They may therefore be discouraged from applying for the benefits. [½]

Employer-sponsored schemes may be designed to integrate with the basic flat-rate pension, and hence employers will not welcome additional complications caused by introducing means testing. [½]

The government that introduces means testing runs the political risk of being unpopular.[½]

(Max 6)

ii) Demographic trends

Many countries are anticipating a significant increase in the ratio of retirees (those receiving benefits) to those in work (who are financing the benefits). [1]

Common demographic trends that are being observed in developed countries are:

- increasing longevity [½]
- more people reaching pension age due to improving mortality [½]
- birth booms in previous periods [½]
- declining birth rates in more recent times. [½]

The problem may be exacerbated by:

- fewer people working, due to more people in higher education, increasing unemployment rates, career breaks and people retiring earlier. [1]

(4)

iii) Four ways to reduce total level of State pension outgo

- Increase the age from which the State pension is payable. [1]
- Reduce the starting level of the pension. [1]
- Reducing or removing the pension increases. [1]
- More stringent conditions for receipt of full pension: [½]
- increase the number of years required in order to be entitled to a full pension
- restrict benefit payments to certain individuals, eg only permanent residents of the country
- means-test the benefit, taking into account other sources of income, (eg from occupational pensions or earnings if not retired) and/or savings.

[½ mark per bullet point]

In addition the government may try to encourage private provision. [1]

(Max 5)

iv) Other issues the Government should consider:

Needs of the State:

- How quickly the State wishes to reduce the cost.
- How large a reduction in cost is required.
- How socially and politically acceptable the changes are.
- The impact on administration.
- The impact on other benefit costs, eg social security costs.
- How the changes can be communicated to the public to manage expectations.
- How any changes in eligibility affect other pension provision and savings.

[½ mark per bullet point]

- The State should consider alternatives to reducing pension outgo, and their implications.

[½]

These alternatives include:

– increasing contributions to the State scheme, eg through increasing taxes

– moving to a pre-funded arrangement, rather than PAYG. However, the financial burden of this is likely to be higher in the short term and may involve one generation paying twice.

[½ mark per bullet point]

Needs of the recipients:

- What is the desired net replacement ratio? Any reduction in benefit will lead to a lower net replacement ratio being achieved, and this may particularly be the case for the lower paid.
- What is the expectations of benefits especially for those approaching retirement?
- Any changes in eligibility may lead to some individuals not claiming their entitlements.

[½ mark per bullet point]

Needs of the employers:

- The impact on working patterns.
- The impact on occupational pension provision.
- Will the State need to compel or encourage occupational provision?

[½ mark per bullet point]
(Max 6)

v) Rationale for taking account of state benefit arrangements

Protection for disability, sickness, death and loss of income in retirement comes from various sources. Therefore if there is a desire by the employer to target a given level of such protection in total, it will be necessary to take account of those other sources when designing the scheme benefits. [1]

By allowing for other sources of benefit the employer will reduce the cost of providing benefits. [½]

If the employer does not do so, the total benefit may exceed the level of protection that the employer feels is necessary and so the scheme benefits will cost more to provide. [½]

Whether, and how, the various State benefits are taken into account will be influenced by the degree of administrative complexity involved. [½]

In many cases, implicit rather than explicit adjustment will be made in order to avoid these complexities. However, a possible reason for making an explicit adjustment is that the total target benefit will then be immunised against changes in the level of State benefits. [1]

It is easier to integrate with some aspects of State benefits, eg a State flat-rate pension as opposed to a more complicated earnings-related benefit. [½]

How the State benefits are funded could, in theory, affect the level of contributions payable to the employer-sponsored arrangement. For example, compulsory State scheme contributions could be taken into account when setting the level of contributions payable to the scheme, both by the employer and members. [1]

(Max 4)

vi) Financial regulation

- require advance funding
- require separation of any funds needed to provide the benefits from the sponsor's other assets
- require trustee control of funds
- require custodianship of assets
- require authorisation of those individuals or organisations that manage or invest any funds
- restrictions on investments of funds to provide benefits in assets related to the sponsor (ie self-investment)
- regular checks on the adequacy of separated funds
- regular checks on the concentration and diversification of assets
- restrictions on the types of investments used for any funds
- audited valuation of assets

(½ mark each, max 3)

External sources of protection

- place outstanding benefit obligations as a high priority debt in the event of an insolvency
- require financial guarantees from a parent company or shareholders

- compel sponsors, managers, investment managers and any other relevant party to hold insurance against inadequacy of funds in the event of insolvency, negligence, fraud or any other similar event
- require letters of credit to be provided for schemes from banks
- require minimum credit ratings for organisations whose finances may affect the availability of funds
- place a levy on relevant parties to provide compensation as an alternative to insurance against inadequacy
- supervise the finances of commercial benefit providers
- supervise the marketing by commercial benefit providers

(½ mark each, max 3)

Administrative practices

- require benefits to be provided for individuals who leave or surrender before retirement age
- require regular disclosure to potential recipients of their benefit entitlements, the adequacy of funds and the ways in which those funds are managed and invested
- require individuals who are involved in, or who advise on, the administration of the benefit provision or the investment of related funds to report any bad practices to a State regulator
- require the use of professional advisers
- require good record keeping and management

(½ mark each, max 3)

[9]

Solution 2:

i) Option 1 – no change

(a) Accounting Cost:

- no change to the accounting cost to the company

- DC expense for Plan A is straight forward and simply equal to contributions

- DB expense for Plan X will continue to be based on annual valuations at year end measurement dates under accounting standards

(b) Administrative Cost:

- minimal additional cost (compared to before the merger) since no changes required to plans (plan changes are expensive and time consuming).

- Only thing likely required is communication related to new entity (name changes, etc.).

- On an ongoing basis, company will need to have two plan compliances and any regulatory filings, different retirement packages and other required communications, so more time consuming.

(c) Disruption:

- low since everything is as it was before merger related to pension plans.

- However, need to consider the potential impact on employee morale – perception of fairness (one may be perceived as superior than the other based on an employee's perception of performance of plans, different risk of DB vs DC plans, different forms of payment and death benefits payable).

(½ mark each, max 4)

Option 2 – freeze X (DB), future accruals in A (DC)

(a) Accounting Cost:

- Curtailment accounting for Plan X due to the freezing of benefits. If X is a final salary or final average salary plan, likely to be a gain due to the decrease in liability

- No future service costs going forward in Plan X since no future accruals

- DC expense for Plan A is simply the increased contributions going forward covering both member populations

(b) Administrative Cost:

- can be expensive - costs are required to freeze plan X benefits and enroll all those members into plan A (plan amendments, participant communication, etc).

- However, going forward, plan A is less costly to maintain overall, being a DC plan.

- Also, Plan X will likely be less costly to maintain than before, now being a closed plan.

(c) Disruption:

- Plan X members may not be happy to lose benefit security of DB plan and forced change.

- DB plan accruals usually more valuable at end of career near retirement so Plan X members will lose out on this.

- Also, employees currently in Plan X will receive benefits from two separate sources, and total benefit is likely reduced.

(½ mark each, max 4)

Option 3 – employee choice & if move to A, convert past service benefits as opening balance

(a) Accounting Cost:

- Some members in Plan X will elect to enroll in Plan A and convert past benefits to Plan A:

- There will likely be a curtailment/settlement gain (assuming a final salary plan) for Plan X as they will no longer have future accruals under Plan X, and will be transferring liability (settling the liability on a specific measurement date) to Plan A
- Future service costs would be zero for these members (total service cost for Plan X will decrease going forward)

- Some members in Plan X will elect to stay in Plan X, so there will continue to be service cost and interest cost in this plan, but at reduced levels

- Expect anti-selection to increase total costs since employees will pick option most beneficial to themselves

(b) Administrative Cost:

- expensive. Communication requirements to give members the option to convert (likely running projections with scenarios to assist with choice, hosting employee education sessions, etc.), actual process of collecting employee choice and doing the conversion.

- More ongoing maintenance too, since 2 open plans to manage (one of which is DB).

(c) Disruption:

- XYZ members will be happy to have the option to pick the plan best for their circumstance.

- No changes for ABC members.

- From an employee perspective, this may be a best case scenario with least disruption.

(½ mark each, max 4)
[12]

ii)

(a) Young employee – recommend converting to Plan A

- fairly new in Plan X where benefits are likely not material yet

- DC is better for portability for a more mobile work force

- This employee is fairly new at this company and may not become a career employee, especially considering the merger may change company culture

- potential investment choice in the DC plan

(b) Older employee – recommend staying in Plan X

- not too far from retirement age, likely not changing jobs until retirement

- even if company culture changes for the worse due to acquisition, can consider retiring early with a more secure benefit in Plan X

- DB benefit has better security for employee

- Want to maximize any early retirement subsidies which may be available from DB plan, which are dependent on age and service

(½ mark each, **max 4**)

<u>Solution 3:</u>

i) "Total cost known in advance"

The total cost is not known in advance as it will depend on the number of employees joining the scheme. [½]

Furthermore, the total cost per employee is only known in advance (as a percentage of pensionable salary) if the contribution rates are fixed, and even then future pensionable salary is not known with certainty. [½]

However, the total cost per employee may not be known in advance if:

- some elements of the scheme benefit structure are not provided on a defined contribution basis, eg lump sum on death in service as a multiple of salary [1]

- the scheme offers any guarantees, eg a minimum annual investment return on contributions [½]
- the rate of company contributions depends on the members' chosen rate, eg if the company agrees to match employee contributions [½]
- rate of company contributions depend on members' age / service [½]
- there is moral pressure on the employer to provide higher benefits if funds should prove inadequate. [½]
- in case there are DB underpins provided [½]

Future administration expenses are uncertain. [½]

Future legislative changes may have an impact on the cost of scheme provision. [½]

(Max 5)

ii) "Administration is simpler"

Benefit calculations are typically simpler because the member receives the accumulated value of the individual account. The calculation of a pension from a defined benefit scheme may require calculations of pensionable service, final pensionable salary etc. [1]

Record keeping is usually more complicated because contributions must be recorded for each active member. These are generally paid monthly. In a defined benefit scheme, member records may be updated no more often than annually. [1]

Investment of contributions in a defined contribution scheme is more complicated. [½]

Contributions for each member must be invested in the appropriate funds according to that member's wish (if there is investment choice) and/or the member's age (if assets are invested to match annuity rates at retirement) … [1]

… whereas contributions to a defined benefit scheme are invested without individual allocation. [½]

It is more complicated to estimate members' benefit entitlements at retirement, eg when producing benefit statements. Calculations for a defined contribution scheme require projections on a suitable basis, which may be prescribed. [1]

If pensions are bought out using immediate annuities, responsibility for administration is transferred to the insurance company. [½]

Regular funding valuations of defined benefit schemes can be time-consuming and costly, there is no need for such valuations in a defined contribution arrangement. [½]

(Max 5)

iii) Factors to consider before making a recommendation

What the employer can afford is a very important consideration. [1]

The schemes of competitors should be taken into account. This includes competitors in the same industry, and to a lesser extent, competitors in the same geographical region. [1]

In theory the first step is to decide on the target benefits, ie the benefits you would hope to provide for an employee after an agreed period of service. [1]

The main considerations here are:

- the effective target accrual rate [½]

- the definition of pensionable salary [½]
- integration with State benefits [½]
- the level of pension increases [½]
- the amount of spouse's / dependant's pension [½]
- the level of lump sum death benefits. [½]

The employer may decide to provide protection benefits separately, eg a lump sum on death in service plus a spouse's pension of, say, 25% of salary or ill-health insurance for salary continuation. [1]

In considering what to include as pensionable pay, the volatility of earnings should be considered. If overtime / bonus / commission form a large regular part of remuneration, these are more likely to be included. [1]

Once the total contribution rate has been determined, the split between the employer and employee needs to be decided. [½]

The contribution rate required from employees will be influenced by competitors' schemes and whom the employer wishes to target for scheme membership. [½]

A very important point to remember before making your recommendation is that unless you change the scheme rules in the future, you will not be able to change the contribution rate. [½]

In particular, it will be unpopular to try to reduce the employer contribution rate in the future. [½]

Therefore, your assumptions are important and will directly determine how expensive the scheme will prove (ie actual cost will be fixed). [½]

(Max 9)

iv) Main economic assumptions

Your assumptions should be a best estimate, unless the employer has specifically stipulated that it wants you to err on the cautious side to reduce the probability of pensions at retirement being less than members expect. [1]

If you use prudent assumptions (and best estimate is borne out in practice), you will "force" the employer to ultimately provide much more generous, and hence costly, benefits on average than were intended (since this is a defined contribution scheme). [1]

The gaps between assumptions are more critical than absolute values. [½]

The most important assumptions are:

- i – e
- i – pension increases. [1]

Derive i – e from the historical relationships i – inflation, and e – inflation. [½]

The value for i – inflation will depend on the mix of assets you expect to hold, noting members may be offered investment choice. [½]

The higher the equity content, the higher the expected return and therefore the value for i – inflation. [½]

If lifestyling is operated then take account of the more conservative investment returns expected close to retirement [½]

The value for e – inflation depends on how you expect productivity to improve in the future. [½]

For i – e, past experience will give some indication of the future, but judgement will be required. [½]

In setting i – e, expenses should be allowed for, unless they are to be met separately by the employer. [½]

i – pension increases depends on the level of pension increases that you would like to (notionally) provide for the employees. [½]

(Max 6)

Solution 4:

i)

PUM AL Accrued benefits with full salary projection [½]

AAM AL Accrued benefits with full salary projection [½]

EAM AL Full benefits with full salary projection less the value of future contributions at the SCR (based on actual membership) [1]

CUM AL Accrued benefits with no salary projection (but in practice probably allowing for any statutory revaluation) [1]

Standard Contribution rate = Present values of …

PUM: Benefits accruing in Control Period (usually taken as the next year), full salary projection, divided by pensionable salaries over the Control Period [1]

AAM: Future benefits accruing up to retirement, full salary projection, divided by future pensionable salaries to retirement [1]

EAM: Benefits accruing up to retirement for a typical new entrant at assumed entry age, full salary projection, divided by pensionable salaries for that new entrant up to retirement [1]

CUM: Benefits accruing in Control Period (usually taken as next year), salary projected for one year only, plus revaluation of actuarial liability to level required at end of the Control Period, all divided by pensionable salaries over Control Period [1]

(Max 6)

ii) No additional discretionary increases.

This is possibly a sensible course of action. [½]

But established discretionary practice will have built up expectations. [½]

It would be unpopular to withdraw this discretion. [½]

The amount of saving depends on future level of inflation. [½]

If inflation is low, saving may be nil for many years, and acts extremely slowly (if at all). [½]

If inflation is high, this approach will quickly remove the deficit, but to the detriment of current pensioners. [½]

Effect on valuation result depends on any allowance for discretion built into basis. [½]

The allowance could be explicit, or implicit. [½]

If allowance is currently made, its removal will reduce the AL, so the past service deficit is reduced. [½]

It will also reduce the SCR for future service benefits. [½]

If no allowance, then no effect on result but actual saving will emerge over time. [1]

(Max 5)

iii) Lump sums paid on death in service

It will be unpopular with members to reduce benefits. [½]

Singles vs members with dependants – it is unusual to discriminate between them. [½]

It is possible, although lack of spouse's pension is already a big difference. [½]

What about unmarried dependants and cohabiters? Is it illegal to discriminate between them? [½]

Administration is more difficult, plus possible onus on trustees to exercise discretion where there is a need. [½]

Females vs males – usually illegal to discriminate. [½]

Anyway, argument of "husband supporting wife, not the reverse", is outdated. [½]

Usually there is no impact on the AL nor past service deficit of such a change. [½]

There will be some very small reduction in future costs and the SCR. [½]

Saving depends on proportions affected, and their ages and salaries. [½]

(Max 4)

iv) Less cautious actuarial assumptions and use of Projected Unit method

Weakening the basis would disclose a smaller deficit (lower AL &/or higher asset value dependent on approach to asset valuation). [1]

May lead to smaller SCR too (depends what part of the basis is made less cautious). [½]

Suitability depends on current basis, and degree of conservatism contained. [½]

Probably should use a more realistic basis if current basis is too cautious. [½]

Removal of caution may lead to too great a risk of failing to meet any statutory minimum funding test or result in insolvency on a discontinuance basis. [1]

Changing from AAM to PUM would have no effect on the disclosed deficit, since have same AL. [1]

It would, though, disclose a lower SCR. [½]

Could argue AAM (with additional prudence) would solve problem faster. [½]

Basis and funding method change – general considerations are:

- No change to long-term costs of scheme, only affect pace of funding for benefits: [1]
- Company would probably pay less next year … [½]
- … or be seen to be clearing deficit quicker. [½]
- This is really only a presentational change. [½]
- The change could be seen to justify a lower MCR from the company. [½]

(Max 6)

v) Future accrual of benefits

This is a possible course of action. [½]

It would be unpopular with members to reduce benefits. [½]

It may not be possible to reduce accrued rights. [½]

Consider employment contracts of current actives – would there be legal problems with constructive dismissal cases? [½]

High profile change, if to accrual rate especially – consider competitors' schemes. [½]

Could try other changes, eg larger offset from pensionable salary, higher member contributions, lower spouses' pensions, higher retirement age. [½]

Introduce a package of measures, improving some benefits to ease acceptance. [½]

If company cannot afford current scheme, it is better to offer lower benefits than no scheme at all. [½]

No effect on size of current deficit. [½]

Reduces SCR (so gives scope for money to go to clearing deficit). [½]

Saving large if change from 2% to 1.5%, may be less for other changes. [½]

(Max 4)

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