INSTITUTE AND FACULTY OF ACTUARIES

EXAMINERS' REPORT

April 2014 examinations

Subject ST4 – Pensions and other Benefits Specialist Technical

Introduction

The Examiners' Report is written by the Principal Examiner with the aim of helping candidates, both those who are sitting the examination for the first time and using past papers as a revision aid and also those who have previously failed the subject.

The Examiners are charged by Council with examining the published syllabus. The Examiners have access to the Core Reading, which is designed to interpret the syllabus, and will generally base questions around it but are not required to examine the content of Core Reading specifically or exclusively.

For numerical questions the Examiners' preferred approach to the solution is reproduced in this report; other valid approaches are given appropriate credit. For essay-style questions, particularly the open-ended questions in the later subjects, the report may contain more points than the Examiners will expect from a solution that scores full marks.

The report is written based on the legislative and regulatory context pertaining to the date that the examination was set. Candidates should take into account the possibility that circumstances may have changed if using these reports for revision.

D C Bowie
Chairman of the Board of Examiners

July 2014

General comments on Subject ST4

This subject examines the ability of candidates to apply core actuarial techniques and concepts, together with specific knowledge of pensions and other benefit arrangements to simple, but practical situations.

The examiners therefore look for candidates to apply their knowledge of the core reading to the specific situation that the examiners asked, having read the question carefully. Too many candidates write around the subject matter of the question in more general fashion, or focus on one aspect of the issue at great length, in either case gaining few of the marks available.

Good candidates demonstrate that they have used the planning time well - an attempt to get a logical flow is a big advantage in making points clearly and without repetition. This also enables candidates to use the later parts of questions to generate ideas for answers to the early parts (or use their solutions to earlier parts of questions to create a structure for later parts). Time management is important so that candidates give answers to all questions that are roughly proportionate to the number of marks available.

Comments on the April 2014 paper

The overall standard of scripts was broadly as expected, and this was reflected in a very similar pass rate to the previous sitting.

There was significant variation in marks that enabled a clear distinction between those candidates worthy of a pass and those who needed more depth to their knowledge It is very important that candidates consider all aspects of the question, and read the preamble fully. There is never superfluous information in the question, and by using all of the information available, candidates can ensure they give a full answer.

More detailed feedback is provided on each question below.

1 (i) *Advantages*

- The sponsor of a defined benefit scheme is exposed to a number of risks
- If experience is poorer than expected the cost of the scheme to the sponsor will rise
- And its accounts will be impacted
- If the scheme insures all its pensioners, then all the risk relating to them will be passed to the insurer
- i.e. longevity risk
- investment risk
- and inflation risk (if applicable)
- The volatility of the scheme as a whole will be reduced
- May be insuring pensioners only as they are typically less expensive to insurer than non-pensioners

Disadvantages

- The upside risks are passed to the insurer
- The purchase price has to cover insurance company expenses and a contribution to its profit
- There is an immediate liquidity constraint when buying the annuity
- Dealing with issues such as future addition of discretionary pension increases becomes complicated
- The scheme is still subject to volatility arising from the non-pensioners
- The scheme is subject to the risk of the insurer defaulting
- The solvency of the scheme might reduce placing increased reliance on the employer covenant

(ii)

- The individual's sex
- The individual's postcode/address
- The individual's size of benefit
- Industry the scheme operates within
- The individual's occupation or socio-economic group
- The individual's year of birth
- The mortality experience observed in the insurer's population
- Mortality experience observed in the country's population
- Expectations for trends in future mortality
- Pension size/earnings

(iii)

- The sponsor will aim to keep costs low and will therefore be more likely to select underwriting if it thinks it will lead to a lower premium [1]
- This may be the case if a significant number of members have a lower life expectancy than the insurer would expect without underwriting
- For instance if they have poor medical history
- Or a less healthy lifestyle
- But to what extent are they already reflected into the insurer's assumptions by looking at other factors
- …such as occupation and postcode analysis?

- The extent to which the sponsor is familiar with members' health is likely to depend on the size of the membership
- …And only the sponsor of a very small scheme may have enough knowledge of its members to have a view on their health
- But a scheme with a few individuals with high liabilities and lower life expectancy may be a suitable candidate
- …as the sponsor is more likely to be familiar with the state of health of an ex-director for instance
- …and insuring them would remove a significant element of risk from the scheme
- If it approaches an insurer offering medical underwriting but does not opt for it, will the insurer assume that members have a longer life expectancy than average?
- …and charge a higher premium
- There may be practical difficulties in arranging medical underwriting
- …and encouraging members to respond
- The cost of underwriting large groups of members may be expensive
- …how will this affect the premium
- It may not be the sponsor's decision (may be the trustees)
- And in any case should take in to account trustee views on the potential member reaction.

This question was generally quite well answered, although the answers to part (iii) showed significantly more variation. Those who scored well were able to cover sufficient breadth in part (iii) to score well. Many candidates who did less well tended to go into too much detail on one aspect of the answer without covering sufficient breadth, therefore limiting their scope to score marks.

2 (i) *Bonds*

- Government-backed bonds have low default risk
- The default risk of company-issued bonds varies depending on rating of the company
- Income is fixed in monetary terms
- …or in real terms (e.g. index linked)
- Defined levels of capital redemption on defined dates
- High volatility in real terms (if fixed in monetary terms)
- Bonds usually have a lower default risk than equities
- Lower dealing cost
- Lower expected return
- Can be liquidity issues for company stock

Equities

- Less certainty about the levels of income
- Income (dividends) depends on the profitability of the relevant company
- Do not provide any capital redemption proceeds
- Capital can only be redeemed by sale on the open market
- Market values of equities are generally more volatile than bonds

- Lower running yield than bonds

(ii)

- The benefits are defined therefore benefits payable should be unchanged
- But there may be reduced security of accrued benefits as returns will be less certain
- If equity returns are poor the sponsor may have to pay increased contributions in the short term and benefit security will be impacted if the employer defaults
- But over the long term equity returns would be expected to be higher than bond returns
- So the scheme will be less costly to the sponsor
- And it may be more likely to allow benefit accrual to continue
- And job security may be increased for active members
- Increased chance of discretionary benefits if returns are good

(iii)

- The investment strategy should have regard to the liabilities of the scheme
    - Nature of liabilities (fixed or index linked)
    - Duration of the liabilities
    - Currency
- …in order to reduce mismatch risks
- …and incorporate an appropriate level of diversification
- The current funding position
- Size of the fund and whether it is likely to increase or decrease
- The expected cashflows of the schemed the sponsor
- Likely changes to the liability profile in the short, medium or long term
- Consider an ALM study

- Attitude to risk of the trustees
- … and the scheme sponsor
- …and the impact on the employer s future contribution rate
- Strength of sponsor covenant
- Legislative constraints and guidelines
- Liquidity and marketability considerations
- Costs (of transition and ongoing)
- Need to involve the employer (e.g. consult or obtain consent)
- Adequacy of trustee governance arrangements to implement and monitor new strategy

This question was relatively straightforward for well prepared candidates. Once again, in part (iii) the better candidates were able to demonstrate breadth to their answers.

3 (i) Transfer vales
Early retirement
Late retirement
Commutation
Additional spouse's pension

(ii) General principle is that costs should not be significantly different
However, administrative simplicity is likely to be a consideration
So assumptions may not reflect individual circumstances (e.g. marital status)
And factors are often smoothed
Factors can be adjusted for current market conditions
Assumptions can be amended to reflect concerns about selection risk
Or to seek to improve the take up rate of the option
Discretionary benefits may or may not be considered
Assumptions used could be either realistic or prudent
[Additional point for a good example of the impact of using realistic or prudent assumptions]

(iii) If the member is likely to die before retirement date then could either
Stay in employment and receive death in service benefits
These are likely to be a lump sum multiple of salary
Plus a spouse's pension based on service to retirement date

Or the member could take an ill-health early retirement
Which could possibly be enhanced to take account of service to NRA
On retirement member could take a tax-free lump sum
Which would not affect spouse's pension
So spouse's pension would be very similar to death in service
On death would also receive balance of any guarantee for members' pensions
This is usually 5 years but could be as long as ten

If likely to survive past retirement could work until then (if capable)
The retire normally receiving similar benefits to ill-health retirement above
There is an option to swap member's pension for additional spouse's pension
However, this could be at the Trustees' discretion and they may not allow it
Or set terms based on member's ill health so not worth it

The member might be forced to leave service with correspondingly lower death benefits
Although he/she could always take a transfer value
And use it to buy a pension with much higher spouse's pension
Or pass it on as a lump sum as part of the death benefits payable from a personal pension scheme

This was relatively well answered. The best marks were secured by those who broke their answer down in part (iii) to show different scenarios and gave proportionate depth on each of these scenarios.

4 (i) Shows the ability and willingness of the sponsor to pay sufficient contributions to ensure the benefits can be paid as they fall due
Used to determine the key assumption and the level of required prudence
And the investment strategy
And general risk tolerance level
Affordability of future deficit funding plans
Can be used as part of a process to obtain contingent asset protection

(ii) The sponsor's covenant is not an important issue if it is certain that the sponsor will not default (e.g. some State sponsored schemes) or
the scheme is so well funded that no further contributions are required from the sponsor or
the sponsor covenant is so weak as to be deemed nil or
the sponsor has no further liability to make contributions under the rules of the scheme

(iii) Valuation

Assumptions
If previous valuation had allowed for the sponsor covenant by adjusting the discount rate
then any reduction in rate could be reduced, or removed
(or possibly increased e.g. to target self-sufficiency/buy-out)
to take account of the strong covenant
the actuary could suggest the level of change based on the change in probability of default

Deficit payments
A longer payment period could be acceptable
Resulting in smaller payments
Although if strong employer then they should be able to afford to pay more
And quicker

Investment
If company can support scheme then can move into riskier return seeking assets
e.g. move from bonds into equities
This could have a knock-on effect onto valuation assumptions
As higher return could be allowed for
Reducing deficit (if any) and payments required

This was a relatively straightforward question, with well prepared candidates able to score very well.

5 (i)

- To improve the prospect of adequate provision for citizens in retirement
- Seems likely that currently a significant proportion of the population is making inadequate provision
- To encourage citizens to take ownership of their retirement provision
- The government may believe that providing incentives to save for retirement is not sufficient
- Perhaps employers did not see any benefit in providing pensions
- And citizens did not see their value
- To reduce the reliance of citizens on the state to provide for them in retirement
- Under the proposal, employers and employees will instead meet the cost
- The government's criteria will be in place to ensure that the DC arrangements are adequate to meet the aims of the measure
- …such as providing adequate protection of individuals' funds
- Investment in pension funds could help drive economic growth

(ii)

- Firstly the government will need to decide what level of benefit the scheme should provide
- Is it intended to entirely meet an individual's income needs in retirement?
- Or to top up state benefits?
- What age can individuals be expected to retire at?
- Will dependants' benefits need to be purchased?
- Will the pensions need to increase in retirement?
- Will any ill health
- …or death before retirement benefits be covered?
- Will they be age dependent?
- Or sex-specific or unisex?
- Whether there is a requirement to buy an annuity
- And if so, the expected cost of buying an annuity at retirement, which will depend on future inflation and mortality rates
- The more expensive this is the higher contributions will need to be
- The types of investments available to members
- And the expected return on the invested assets
- The lower they are the higher contributions will need to be
- Administration costs
- The government should take into account the level of contributions made by employers and employees who do currently have pension provision
- And in other countries with similar schemes
- And consider if these are adequate
- What can employees and employers reasonably afford
- Taking into account existing tax burdens
- And the state of the economy
- Contributions that are too high will be politically unpopular
- Consider if they should be introduced at a low level and gradually increased
- Will a maximum level of contributions be set as well as a maximum

- The split between employer and employee contributions
- Will the state offer any top-up or tax incentive?
- Will the contributions be a fixed amount or a percentage of pay?
- Whether any members should be exempt

(iii)

- It may be unpopular with citizens of the country
- …and employers
- Who may not understand the scheme and eg view the contributions as an additional tax
- Which may result in lost votes for the party in power
- This may will especially be the case where citizens do not see the value in pension provision

- Employers may be unable to afford the contributions
- Or the cost of administering a scheme
- Which may put businesses under a strain
- And possibly result in job losses or insolvency

- Employees may be unable to afford the contributions
- Which may leave them reliant on other state benefits
- This will be particularly relevant to less wealthy individuals

- There may not be sufficient suitable DC arrangements available
- It would be disproportionately expensive for smaller employers to set up their own DC schemes

- Regulations will need to be introduced which might be complex
- Together with an approach to enforcing compliance

(iv) *Unpopular*

- Education and communication about why saving for retirement is important
- Education about what will happen to the contributions (i.e. not go into general tax revenue)

Employers may be unable to afford

- Tax breaks for employers on contributions
- Enable administration costs to be met out of members' funds

Employees may be unable to afford

- Tax breaks for employees on contributions
- Provide an exemption for the lowest paid workers
- Who may qualify for state benefits at retirement
- Phase in higher contributions over time

There may not be sufficient suitable DC arrangements available

- Provide a state-run DC arrangement so employers don't need to establish their own
- Encourage private provision of DC funds by financial institutions, perhaps by tax incentives

Regulation and enforcement

- Take a consistent approach to current tax based regulation
- Introduce a regulator to enforce the new arrangements

This question had a wide variation in marks. Many candidates approached the answers without any clear structure making it hard to identify separate ideas and therefore hard to mark. By using a structured approach to the answer, it was relatively straightforward to generate ideas and therefore score well. In part (ii) in particular, a breadth of ideas was needed to score well and only the better candidates were able to do this. This question is a very good example of one where candidates who took good notice of the number of marks available for each section were able to score well by focusing their efforts on the areas where marks were available.

6 (i) A minimum and maximum age limit on joining the scheme
A minimum service period to be served before joining
The pension scheme can be offered only to those types of workers that company wishes to reward
The pension scheme could be offered just to full-time (not part-time) employees
Although could be illegal

(ii) A defined benefit scheme will have some or all of the following features:
Fixed amount
Linked to service
Linked to price inflation
Linked to salary at or close to retirement

By their very nature, defined benefit schemes have an inherently uncertain cost

Provide a benefit based purely on service with no link to salary
Predictable cost
More generous to lower earners
Level of benefit could be set to keep costs low
and adjusted in future to keep costs stable

If employer wants to provide final salary scheme then

Accrual rate – a lower accrual rate will have lower costs

Salary linkage – if based on final salary could impose a cap
The cap could be fixed
Or go up each year in line with an index

Or just when funding allows
Have a maximum salary increase each year
Alternatively could be based on average salary over service period
Which is more predictable than a final salary scheme
Possibly revalued up to retirement in line with inflation
Leading to a less controllable cost

Pension increase – no increases in retirement is cheapest and most predictable
If legislation allows this
Alternatively minimum statutory
Similarly for members that leave service – again depending on legislation
Possibly have discretionary increases if funding allows it

Other benefits – just provide members' pension
No spouse's pension
Or death in service benefits
However these are quite cheap, easy to insure and are valued by members

Members could have high contribution rate and employer pays balance
Alternatively cost could be split between employer and members
So if costs go up then members pay more

Introduce eligibility criteria
Ensure that options are priced on a cost neutral basis (or to make a profit)
Adopt a high retirement age

Simple benefit structure will keep administration costs low

Adopt a design where matching assets are readily available
Or it is easy to insure

Incorporate a process to reduce benefits if the scheme is not fully funded

Ensure the design is tax efficient

(iii) Assumptions – contributions based on capped salary
Member remains in service until retirement
Cap remains at £45,000
Control period of 1 year

(a) Effectively assuming no increase in future salary
So would reduce SCR by factor of $1.03^{25} = 2.094$
Gets SCR of 11.9%

(b) Either
Assume average salary increase over 25 years to get to cap is 1.635%
Then SCR reduced by $(1.01635/1.03)^{26} = 0.716$
Gets $25\% \times 0.716 = 17.9\%$
Or

Just need 13.75 years of 3% increases to get to cap
The SCR reduced by $1.03^{(25-13.75)}$
Gets 17.9%

(c) $20{,}000 \times 1.03^{25} = 41{,}875$
so never reaches cap
Therefore SCR is 25%

This question shows the typical result for a numerical part – candidates either score well or very badly. It is important to show full working in a numerical question, to enable the examiners to identify the thought process followed and hence assess the level of understanding of candidates. In part (ii), candidates needed to cover the full range of ideas to score well.

END OF EXAMINERS' REPORT