Actuaries Institute Australia

LIFE INSURANCE AND RETIREMENT PRODUCT DEVELOPMENT

TUTORIAL 4 SEMESTER 1 2020: VALUATION

Education Program
ACTUARIES INSTITUTE

Education that Counts

Question 1 [12 marks]

The ABC Pension Scheme is a multi-employer final salary pension scheme that is closed to new entrants but open to future accrual for current members. A funding valuation is currently being undertaken and the actuary, having performed an analysis of recent scheme experience, is considering what assumptions to propose to the trustees.

(i) Outline the issues that the actuary should consider concerning the credibility of recent mortality experience for the purpose of setting assumptions. [3]

The trustees have asked for an explanation of how the key assumptions to adopt for the valuation might be derived and what issues should be considered.

(ii) Set out the points the actuary might make in her response. Your answer should cover the following: [9]

- general principles;
- discount rate;
- pension increases;
- salary increases;
- mortality assumptions;
- withdrawal rate.

Question 2 [9 marks]

A major retail company sponsors a well-funded final salary pension scheme. Recently the costs of the scheme have been increasing dramatically. The finance director of the company has set the objective of reducing the future volatility of the contribution rate, without making any changes to the scheme's benefit structure.

(i) Outline the options that are available to achieve the finance director's objective. [7]

The company decides to control the costs of the scheme by limiting the growth in pensionable salary. Increases in pensionable salary will be restricted each year to the rate of price inflation, and non-pensionable bonuses will form a larger element of overall remuneration.

If an employee is promoted, their pensionable salary may be increased to reflect their new responsibility. This promotional increase would be in addition to the annual inflationary increase.

(ii) Comment on the practical issues that will need to be addressed in order to implement this strategy. [4]

(I would not ask this in the valuation exam but want you to gain experience of dealing with odd questions.)

It is now three years since the strategy was implemented. The inflationary increases to pensionable salary in the last three years have been 1.8%, 0.8% and 3.3% respectively.

The following tables are excerpts from the membership data for the actuarial valuation due to be carried out this year, and from the actuarial assumptions used in the last valuation.

Table 1: details of average pensionable salaries by age for members who have been in service continuously from the last valuation to this valuation

Age nearest x	Average pensionable salary at this valuation for members aged x at this valuation ($)	Average pensionable salary at last valuation for members aged x at this valuation ($)
38	31,374	28,980
39	28,841	25,776
40	57,894	53,646
41	37,640	34,676
42	32,415	30,160

Table 2: promotional salary scale assumption s_x used in the last valuation

Age nearest x	s_x
35	223
36	228
37	233
38	238
39	243
40	247
41	250
42	253

The promotional scale s_x excludes any allowance for annual inflationary increases to pensionable salary.

. (iii) Extend Table 1 to show calculations for the following figures in respect of the above scheme membership over the triennial inter-valuation period:

- actual promotional salary growth
- expected promotional salary growth
- the actual/expected percentage for promotional salary growth

Include details of the formulae you have used. [6]

(Hint: extend table 1 to include the 3 additional columns as requested by the question. The mathematics involved is extremely simple but you need to have a clear head. A key actuarial skill is working in the correct units. Salary three years ago compared with salary today involves inflation and promotion. Make sure you compare like with like.)

(iv) (a) Comment on the results in part (iii), and

(b) Describe the further investigations and actions that might be appropriate. [7]

Hint:

"Comment on results" questions are often the easiest ones set, as there are a lot of marks for simply describing the results achieved. The analysis covered a few age groups – what else could be done?

Answers to (iv)(b) often highlight a general lack of understanding of the purpose of the exercise. The aim is to assess the salary scale used for the valuation to see if it is still suitable. The whole focus of the question is on the pension scheme and not on the company's remuneration policy. Students often seem to regard the point as to assess whether the new remuneration practice was fair or working properly – and no marks are available. The general point that will repeat time and time again is the desire for students to narrow down an answer to what they think is a fair situation rather than demonstrate the wide variety of possible answers.

Question 3 (19 marks)

A country has a large horseracing industry. Horses generally start racing between the ages of two and five. Most horses are retired from racing when they reach the age of thirteen. A very small number of horses are retired at younger ages for breeding. Revenues from breeding fees can be very high but are very volatile.

It has been proposed that a proportion of all breeding fees should be used to provide contributions to a general fund that will be invested in order to provide benefits to look after horses in retirement.

All horses actively involved in racing would be covered by the fund.

Benefits would normally only be payable when horses retire from racing aged thirteen.

Benefits would only be available in respect of retirement before age thirteen if the horse is certified as injured by a registered vet.

No benefits would be payable on the death of the horse either before or after retirement.

(i) Outline the demographic information that would need to be considered when determining the cost of any retirement benefits. [5]

Two possible forms of benefits have been proposed:

(a) **Benefits for each horse will be paid out of the general, overall resources of the fund**

DB

Benefits will be calculated as a cash amount for each year of a horse's racing career to be paid as an annual income from retirement until the horse dies. This amount will be the same for all horses and will be increased each year, both before and after retirement, in some way to allow for inflation.

(b) **Benefits for each horse will be provided from individual accounts held within the overall fund**

DC

A proportion of each year's contributions will be allocated to each horse. These contributions will form individual accounts for each horse. The value of these accounts will grow in line with investment returns earned by the general fund. On retirement, the accumulated individual accounts will be used to provide appropriate benefits.

In both cases, any proceeds would be payable to the horse's owner who would use them on behalf of the horse. Measures would be taken to ensure that any payments are actually used to provide care for horses and not taken by their owners.

(ii) Discuss the relative attractions of each proposal in terms of providing suitable. benefits for horses retiring at age thirteen or on earlier certified retirement. [10]

As an alternative to proposal (a), it has been suggested that instead of paying income until the horse dies, the fund will reimburse the cost of housing the horse at a "retirement farm" approved by the fund.

(iii) Describe the additional risks that the fund may face if this alternative were adopted. [4]

Hint: You do not need to know anything about horses or horseracing to answer this question. It looks unusual but isn't it merely superannuation provision wrapped up in an unusual context?