

INSTITUTE AND FACULTY OF ACTUARIES

EXAMINATION

Subject CA3 – Communications

Day 2

Time allowed: 1 hour 30 minutes

INSTRUCTIONS TO THE CANDIDATE

1. *You have 15 minutes before the start of the examination in which to read the question. You are strongly encouraged to use this time for reading only, but notes may be made. You then have 1 hour 30 minutes to complete the paper.*
2. *Copies of the Formulae and Tables, Core Reading for subjects CT1 to CT8 inclusive and CA1 should be available electronically on your PCs. No other material can be brought into the examination room.*
3. *You must not start answering the question until instructed to do so by the supervisor.*
4. *At the end of the examination you should hand in the question paper along with any notes made during the examination.*

PLEASE NOTE THAT THE CONTENT OF THIS PAPER IS CONFIDENTIAL AND STUDENTS ARE NOT TO DISCUSS OR REVEAL THE CONTENTS UNDER ANY CIRCUMSTANCES.

You are a member of a small team at an actuarial consultancy. One of your clients, Company ABC, has appointed a new Finance Director. Your team has just completed the work on an actuarial valuation for Company ABC's final salary pension scheme and the Finance Director has recently joined the Board of Trustees to the scheme. Last week your boss telephoned the Finance Director of ABC to give him indicative results.

Your boss has received the following letter from ABC's Finance Director and has asked you to draft a response explaining what factors can affect a pension scheme's funding level and why the deficit has arisen. She has asked you to focus on the significant items affecting the funding level, including the effect of the purchase of XYZ and the relative strength of the transfer basis compared to the valuation basis.

Company ABC Letterhead

7 August 2010

Dear Susan

With reference to our telephone conversation the other day I am very concerned about what you told me about our pension scheme's finances. While I am not an expert in pensions, my background in investment does mean that I am aware of the financial markets. Since we spoke, I have reviewed the pension scheme's accounts and the investment manager's report. From what I have read, the scheme's assets have outperformed investment markets in general and, in particular, have outperformed the level at which you had set the investment return assumption for the valuation.

Furthermore, I understand from speaking to some of the other trustees that all the assumptions used for the valuation this time are exactly the same as for the last valuation.

How, then, has the modest surplus declared last time turned into such a large deficit? You have advised me that ABC is now going to have to increase its contributions to the scheme as a result of this deterioration in the funding level – hardly value for money considering the large fee you will be charging for such advice.

The only major event I can see from the records which might have affected our pension scheme was when ABC took over XYZ Enterprises and its pension scheme. Our files show that your firm advised us on this and your report at the time clearly stated that enough funds were transferred into the ABC pension scheme at the time to cover the benefits for XYZ's employees. So unless your report was wrong, this should have had no impact on ABC's pension scheme at all.

Your valuation results clearly must be wrong. Please can you therefore recalculate your results correctly as a matter of urgency.

I look forward to hearing from you.

Yours sincerely

William Westfield

Draft your response in approximately 500 words.

A senior student in your team has produced the following figures as a reconciliation of the results of the two valuations:

Valuation of ABC Pension Scheme as at 1 July 2010 vs Valuation as at 1 July 2007

Surplus as at 1 July 2007 € 11,248,196

Roll forward surplus using discount rate of 6.5% p.a.
 $= 11,248,196 \times (1.065^3 - 1)$ € 2,339,058
 (profit)

Surplus changes split into two parts as follows:

A Effect of assumptions used

No changes to assumptions for the 1 July 2010 valuation – same assumptions used as for the valuation as at 1 July 2007, hence no effect on the surplus

€ nil

B Effect of Scheme Experience

Investment experience:

Assets expected as at 1 July 2010 using investment return assumption € 985,626,662
 Actual assets as at 1 July 2010 € 1,006,744,749
 Contribution to surplus
 $= 1,006,744,749 - 985,626,662$ € 21,118,087
 (profit)

Salary experience:

Salary increase assumption as at 1 July 2007 = 5.0% p.a.
 Actual salary increases experienced = 6.93% p.a.
 Value of benefits for Active Members € 736,880,045
 Effect of salary experience
 $= 736,880,045 \times (1.05^3 - 1.0693^3) = 47,908,464$ – € 47,908,464
 (loss)

Effect of XYZ Purchase:

Liability on valuation basis in respect of ex-members of XYZ pension scheme (prudent basis) € 106,485,549
 Liability on sale basis in respect of ex-members of XYZ pension scheme (best estimate basis) € 72,004,760
 Effect of purchase
 $= 72,004,760 - 106,485,549$ – € 34,480,789
 (loss)

Early retirement experience:

Number of early retirements expected over the inter-valuation period = 69

Actual number of early retirements = 62

Liability in respect of the 62 members who retired early during the inter-valuation period
= 28,290,354

Expected strain on early retirement = 10% of liability

Effect of early retirements

$= (69 - 62) \times 10\% \times 28,290,354 / 62$ € 319,407
(profit)

Pensioner mortality experience:

Number of deaths expected over the inter-valuation period
= 84

Actual number of pensioner deaths = 79

Average pensioner liability
= 172,399

Effect of pensioner mortality

$= 172,399 \times (79 - 84)$ – € 861,995
(loss)

Early leaver/deferred pensioner experience:

Number of early leavers/withdrawals expected over the inter-valuation period = 138

Actual number of withdrawals = 106

Liability in respect of the 106 members who became deferred pensioners
= 12,306,733

Expected profit to scheme when active members leave = 25% of liability

Effect of early leavers

$= (106 - 138) \times 25\% \times 12,306,733 / 106$ – € 928,810
(loss)

Commutation experience:

Total lump sum benefits in respect of commutation over the inter-valuation period = 2,355,793

Average commutation factor = 15.938

Pensioner retirement annuity factor = 22.658

No commutation allowed for in valuation basis, therefore effect of commutation

$= 2,355,793 \times (22.658 / 15.938 - 1)$ € 993,282
(profit)

Surplus traced

– € 48,162,028
(Deficit)

Actual surplus calculated as at 1 July 2010

– € 46,061,910
(Deficit)

Regular contribution rate calculated as at 1 July 2007	24.2% of pensionable salaries
Regular contribution rate calculated as at 1 July 2010	23.9% of pensionable salaries
Total salary roll as at 1 July 2010 = 335,884,275	
Annuity at net valuation rate (1½%p.a.) for 10 years = 9.291	
Addition to contribution rate to clear deficit over 10 years	
= 46,061,910 / (9.291 × 0.01 × 335,884,275) =	1.48% of pensionable salaries

Notes:

Unless stated otherwise, all liability figures and values shown in the calculations above are as at 1 July 2010 and are on the valuation basis.

Best estimate (as defined in CA1 Unit 26 Principal Terms) “An actuarial assumption which the actuary believes has an equal probability of under- or over- stating the future experience (i.e. the median of the distribution of future experience.)”

Extract from CA1 Unit 21 Section 1 “Prudence can be described as the inclusion of a degree of caution in the exercise of judgement in conditions of uncertainty, such that gains or assets are not overstated and losses or liabilities are not understated. Thus the greater the uncertainty the greater should be the tendency to aim at technical provisions exceeding the expected value of the liabilities, as a natural consequence of seeking to avoid understating the liabilities.”

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