

EXAMINERS' REPORT

June 2024

Subject F104 —Retirement and Related Benefits Fellowship Principles

INTRODUCTION

The attached report has been prepared by the subject's Principal Examiner. General comments are provided on the performance of candidates on each question. The solutions provided are an indication of the points sought by the examiners and should not be taken as model solutions.

QUESTION 1

- ✓ *Disclosure of fees, expenses and charges protect members from unreasonable or uncompetitive fees*
- ✓ *And financial irregularities*
- ✓ *As well as promote transparency of direct and indirect charges.*
- ✓ *Disclosure also enables fees to be compared across funds, providers and member categories.*
- ✓ *Regulation of the level of fees*
- ✓ *In particular capping of administration and investment fees*
- ✓ *And prescription of the method of charging these fees*
- ✓ *Maximise the level of savings made from member contributions.*

[2]

- ✓ *Actuarial certification may be required for retirement funds*
- ✓ *To ensure that assets and liabilities are valued accurately and appropriately*
- ✓ *To determine appropriate contribution and solvency levels*
- ✓ *On a regular basis*
- ✓ *Actuaries may be required to act as whistle blowers for breaches and irregularities*
- ✓ *to protect the industry and members*
- ✓ *Actuaries must comply with governing body continuous professional development or similar requirements*
- ✓ *to ensure that they remain competent and qualified*
- ✓ *Actuaries must be aware of and disclose their limitations and areas of expertise*
- ✓ *to protect the client from inappropriate advice*
- ✓ *Place limits on the remit of the Actuary*
- ✓ *Maintain confidence in the profession*

[3]

- ✓ *Regulation may require retirees to purchase a life annuity at retirement*
- ✓ *To protect their members against longevity risk.*
- ✓ *Regulation may stipulate whether and how retirement funds may offer in-fund annuities*
- ✓ *and how risk or income is shared in annuity pools,*
- ✓ *for example, level of cross-subsidies allowed*
- ✓ *aiming to ensure fairness and equity across different generations*
- ✓ *and heterogeneous groups within the pool.*
- ✓ *Regulation may permit only certain types of annuity products for retirement provision*
- ✓ *to protect retirees from inappropriate products or exploitation*
- ✓ *Annuity products can be regulated to make them more standardised and comparable across providers*
- ✓ *aiming to reduce consequences of information asymmetry between annuity providers and members/annuitants (consumers)*

- ✓ Regulation with respect to disclosure requirements,
- ✓ detailing how the annuity works and the terms of policies/contracts
- ✓ ensure they are appropriate and transparent from the members'' perspective.
- ✓ Regulation across the industry may reduce transaction costs,
- ✓ improve efficiencies,
- ✓ Promote and improve competitiveness, and
- ✓ Ensure that annuity providers are well capitalised and have appropriate levels of solvency
- ✓ Certain information may be required by regulation from the individual in an annuity application
- ✓ to protect providers from antiselection
- ✓ Or to protect the industry or providers from irregular financial transactions or fraud on the part of individuals
- ✓ Tax regulations aim to protect the state from tax avoidance or evasion
- ✓ and provide tax relief to retired individuals.
- ✓ Regulation of the remuneration of salespeople and the disclosure of that remuneration
- ✓ Aims to protect members against mis-selling or paying unreasonable fees to advisors
- ✓ Regulations around the investment strategies backing annuity products
- ✓ aim to protect capital (for the benefit of providers and annuitants) from being exposed to excessive risk
- ✓ Regulation may restrict certain annuity terms such as drawdown limits

[6]

[Total 11]

Marker comment: Candidates did not do as well as expected in this question, particularly for part (i), which was a straightforward bookwork question. Candidates appeared to struggle to find sufficient points in part (iii), which required specific reference to annuity products, and not just general comments about the types of regulation.

QUESTION 2

Legal team of the defendant (specialist doctor), the client.

- ✓ *This is the client of the actuary and will want to check*
- ✓ *Whether the report includes all the necessary and correct information,*
- ✓ *Is objective and*
- ✓ *Easy to understand and translate in legal terms.*
- ✓ *The objective of this stakeholder is to minimize the potential settlement of the claim against the defendant.*
- ✓ *They will most likely advocate for more realistic*
- ✓ *Or even optimistic assumptions to be used in calculating the values.*

Legal team of the claimant

- ✓ *Will expect their client to be accurately represented in the report.*
- ✓ *They will most likely have an independent report produced for comparison.*
- ✓ *They will compare the information and assumptions used in the reports*
- ✓ *They will advocate to maximise the value of the claim*
- ✓ *In the interest of their client and*
- ✓ *Since they are likely to receive a proportion of the claim as income.*

[4]

- ✓ *The mortality assumption will need to take account of the nature and severity of the injury.*
- ✓ *And how the overall life expectancy will be affected as a result.*
- ✓ *The mortality assumption will dictate how long*
- ✓ *any potential costs of care and treatment might be incurred for.*
- ✓ *The morbidity assumption would be low or even nil in the case of a child under normal circumstances.*
- ✓ *The extent to which morbidity needs to be accounted for will depend on the nature of the injuries sustained*
- ✓ *And whether they give rise to increased morbidity.*
- ✓ *The morbidity assumption will influence the level of medical care costs to include in the calculation*
- ✓ *and will influence the overall life expectancy.*
- ✓ *It may be necessary to engage with medical professionals*
- ✓ *To gain a better understanding the impact of the injuries on both of these assumptions.*

[4]

Marker comment: This question was well answered in general. Where candidates answered what was being asked and thought through the stakeholder points of view they scored well.

- ✓ *Your general area of expertise should be considered*
- ✓ *And the level of experience you have*
- ✓ *in completing actuarial calculations for benefits.*
- ✓ *Whether this type of service is offered by other actuaries*

- ✓ *that may be better placed to perform the calculations.*
- ✓ *Or who can guide and peer review your calculations and report.*
- ✓ *The legislation and guidance available with respect to this type of work should be considered.*
- ✓ *The level of access you may need to specialists that can assist with assumption setting should be considered.*
- ✓ *Other expectations of your time, for example being an expert witness in court,*
- ✓ *And whether you have the capacity and the skill to meet these expectations.*
- ✓ *Any conflicts of interest that you may be exposed to.*

[4]

[Total 12]

QUESTION 3

- ✓ *Legislation and regulatory guidance*
- ✓ *May dictate the type of benefits that can be paid on death*
- ✓ *And will certainly not allow for any type of benefit reduction.*
- ✓ *The size of the lump sum benefit*
- ✓ *And how it can be utilised by the beneficiary will need to be carefully considered.*
- ✓ *Any tax implications for members should be factored into the decision.*
- ✓ *The benefit was previously payable only if a spouse existed*
- ✓ *And is now payable in all cases, to nominated beneficiaries.*
- ✓ *Inclusion of all members into this part of the benefit structure is likely to be well received, however*
- ✓ *Is also likely to increase the overall cost of the benefit*
- ✓ *Unless the lump sum value is low enough to offset the capital value of lifetime annuities that would otherwise be paid.*
- ✓ *It may be costly or difficult to keep confirming that spouse beneficiaries are alive.*
- ✓ *Any increase in benefit cost will need to be quantified*
- ✓ *To ensure that the fund can remain solvent if such a change is implemented.*
- ✓ *The benefit is currently uninsured but will become more straightforward to ensure if the structure is simplified.*
- ✓ *If insurance is not implemented the fund will be exposed to lump sum payments*
- ✓ *As opposed to regular, small annuity payments*
- ✓ *And the expected number of payments will increase due to the increased coverage.*
- ✓ *This may result in a liquidity risk and call for some realignment of the investment strategy as a result.*
- ✓ *The costs associated with such a change (example cost of admin updates etc) and how those costs will be financed should be considered.*
- ✓ *The administration implications will need to be factored in.*
- ✓ *Beneficiary details in respect of all members will need to be collected*
- ✓ *And regularly updated.*
- ✓ *Finding nominated beneficiaries can sometimes be difficult*
- ✓ *And may lead to new operational issues to deal with.*
- ✓ *Spouse's that previously expected to receive a lifetime annuity will be exposed to retail rates*
- ✓ *If they wish to convert the lump sum benefit to an income*
- ✓ *Which will undoubtedly make them worse off.*
- ✓ *The death in retirement benefit should be considered*
- ✓ *To the extent that there are no significant differences to beneficiaries of a death benefit in the year before compared to the year after retirement of the member.*
- ✓ *Lump sum death benefits are easier to quantify and understand than annuity benefits*

- ✓ Which may make them more acceptable to members.
 - ✓ Implementation process [with suggestions on considerations]
 - ✓ Consideration of alternative arrangements [with marks for appropriate suggestions]
- [Total 12]

Marker comment: This question was reasonably answered with some good points made. However, candidates struggled to come up with sufficient points to earn full marks.

QUESTION 4

- ✓ Check for prior reports
 - ✓ Check for prior recommendations
 - ✓ Significant events
 - ✓ As well as opening balance sheet position
- ✓ Check for any changes to regulation or legislation
- ✓ Check for significant events pertaining to this particular fund
- ✓ As well as to any sub-fund
- ✓ E.g. rule changes or retrenchments
- ✓ Gather member data
- ✓ And check (credit given here only if no specific examples are given)
 - ✓ E.g. member recons
 - ✓ Comparison of member accumulated credit over time
 - ✓ Consistency between the contributions recorded in different sources
- ✓ Gather accounting data
- ✓ Gather asset data
 - ✓ And cross-check for validity
- ✓ Set assumptions [marks awarded for details]
- ✓ Calculate the actuarial liability for each subfund
- ✓ Perform an analysis of surplus
- ✓ Set appropriate contingency reserves (at fund or sub fund level)
- ✓ Review results and report
- ✓ Considering the most appropriate way to present this complex information.
- ✓ Have the report checked or peer reviewed as appropriate.

[8]

The union has many functions in this scenario

Sponsor of the union fund:

- ✓ May have specific responsibilities regarding discontinuance
- ✓ Discontinuance of this one sub-fund may have significant implications for overall membership size
- ✓ May mean fund cannot cover overhead expenses
- ✓ Unless charges are increased
- ✓ Which can make the union fund less attractive
- ✓ May have implications for the group risk profile
- ✓ If risk benefits are offered at fund level as opposed to sub-fund level.
- ✓ Trustees may need to change if the departure of HI affects their eligibility.

Trade union

- ✓ Will be involved in negotiations about severance packages

- ✓ And may possibly be asked to verify that the discontinuance terms of the employer fund are fair.
- ✓ May lose many union members if unemployed workers cannot pay their subs
- ✓ Union may offer some unemployment benefits which would be triggered by this decision

[4]

- ✓ Fund will be liquidated and once this is done it will not be possible to correct any errors.
- ✓ If the valuation shows a deficit, this will need to be removed prior to liquidation.
- ✓ Most probably by reducing the member accumulated credit.
- ✓ But care should be taken that the deficit was not caused in some way by HI
- ✓ E.g. not paying risk contributions when due
- ✓ If the fund is in surplus, this will need to be distributed to current and former members.
- ✓ In a fair
- ✓ And economical way
- ✓ The AOS should provide a check on the valuation result
- ✓ As well as explain any unexpected results
- ✓ And identifying the source of any surplus or deficit

[3]

[Total 15]

Marker comment: Candidates scored reasonable marks for parts (i) and (iii). Part (ii) wasn't well answered as candidates did not correctly recognize the role of the union as a stakeholder.

QUESTION 5

- ✓ Stage 1: Decline in mortality
- ✓ The first stage of the demographic transition is marked by a reduction in mortality at all ages,
- ✓ but particularly in infant mortality.
- ✓ During this stage, as more infants survive to childhood,
- ✓ the population will start to grow and the average age may drop
- ✓ Later, the working age population increases as these children age and
- ✓ consequently economic output often increases associated with a fall in the old age and youth dependency ratios.
- ✓ Stage 2: Decline in fertility
- ✓ The decline in child mortality gives parents more confidence that their children will survive to adulthood
- ✓ and fertility rates will start to decline.
- ✓ The population continues to grow but at a decreasing rate.
- ✓ The proportion of elderly people in the population begins to rise,
- ✓ aided by falls in mortality at older ages
- ✓ This causes an increase in the old age dependency ratio,
- ✓ which may not be fully offset by falls in the youth dependency ratio.

- ✓ *Stage 3: Mortality and fertility in balance*
- ✓ *Eventually, fertility and mortality are in balance again but at much lower levels than before the demographic transition.*
- ✓ *The natural rate of population growth will again be zero.*
- ✓ *The retired population will increase dramatically*
- ✓ *but the working age population will start to decline.*

[6]

- ✓ *The degree of effectiveness will primarily depend on the level of the means test.*
- ✓ *The lower the level of the means test, the more effective the proposal will be*
- ✓ *In that only those with very low savings levels can access the state pension.*
- ✓ *However, excluding housing from the means test will offset cost savings*
- ✓ *Since people with paid-off homes but no alternative savings will still be able to access the state pension.*
- ✓ *Private savings is not compulsory and introducing a means test to the state pension will discourage private saving*
- ✓ *Since it would make more sense to pay off a mortgage and still be eligible for the state pension*
- ✓ *Than to have private retirement savings which limit access to the state pension*
- ✓ *And potentially also have mortgage debt at retirement.*
- ✓ *People with private savings will most likely withdraw the full amount to pay off debt*
- ✓ *Or alternatively spend the money irresponsibly (moral hazard)*
- ✓ *With the knowledge that they can fall back on the state pension.*
- ✓ *Overall the proposal on its own is not very effective.*

[4]

- ✓ *The proposal is reasonable at face value since the country is in the third stage of the demographic transition*
- ✓ *Suggesting that there is a high proportion of retirees relative to the working population.*
- ✓ *Currently all of whom are receiving a state pension.*
- ✓ *Fertility and mortality rates are likely to be low*
- ✓ *Which will lead to a steadily increasing cost of the state pension*
- ✓ *And a reducing tax base.*
- ✓ *Allowing higher levels of immigration will immediately increase the tax base*
- ✓ *Provided the economy can uphold an increased workforce.*
- ✓ *Immigrants are also likely to migrate from countries in the first or second stages of the demographic transition*
- ✓ *And will have characteristics, such as large families, that lessen the problems associated with low fertility and mortality rates.*
- ✓ *However, increased migration will bring about increased demand for housing*
- ✓ *And may lead to a housing crisis if*
- ✓ *The infrastructure cannot be developed fast enough and*
- ✓ *Retired homeowners are not incentivised to sell their family homes and down size.*
- ✓ *Migrants are likely to arrive with low savings levels*
- ✓ *And may become dependent on the state for basic needs (such as health care and education)*
- ✓ *Specifically if the economy cannot support the increased labour force.*

Marker comments: This question was not well answered overall. In particular for part (ii) candidates completely ignored the impact of housing not being included in the means test. Part (i), which was bookwork, helped to bolster the overall marks.

QUESTION 6

- ✓ May be difficult to find appropriate matching assets,
- ✓ especially of long enough duration
- ✓ Appropriate matching assets may have higher costs
- ✓ May be including higher risk assets such as equities to earn a higher return...
- ✓ To close the deficit
- ✓ Trustees or Directors may have high risk appetite or budget
- ✓ May need higher returning assets to meet additional benefit targets such as higher pension increases or other benefit improvements
- ✓ The Board of Directors are indifferent between holding equities or bonds in the retirement fund...
- ✓ As the leverage on the company's balance sheet can be offset, or the leverage is not significant, or the leverage is acceptable
- ✓ There may be tax benefits to the company of investing in other asset classes
- ✓ Large employer and mature fund – many employees and compulsory participation, could assume reasonably stable liability profile and decrements
- ✓ less need for safety margin for unexpected and significant liability changes

[4]

Passed from WW to employees (members)

- ✓ .Investment risk – in a DC fund members run the risk that investment returns are lower than expected reducing their benefit at retirement
- ✓ In a DB fund the benefit is based on a predetermined formula
- ✓ Which does not pass investment risk on to members
- ✓ Meaning that the employer takes on the risk that investment returns are lower than expected
- ✓ In which case the employer may need to make additional contributions
- ✓ Investment risk is also present at retirement if members need to purchase an annuity from a provider and pre-retirement investment strategy is not aligned to assets backing annuities
- ✓ Longevity risk – members run the risk that their benefits will be insufficient to meet pension payments for life following retirement...
- ✓ In a DB fund the employer is exposed to this risk as they pay pension benefits to members for life
- ✓ Although members may transfer this risk to an insurer by purchasing a life annuity
- ✓ But life annuities through providers are likely higher cost than receiving a pension directly from the fund
- ✓ Costs and expenses such as investment and administration fees may be higher in the DC fund, reducing members' benefits
- ✓ Inflation risk – if inflation linked pension increases were offered by the DB fund

- ✓ *Provider risk – if annuities are not offered within the fund and employees need to find an annuity provider at retirement*
- ✓ *Employees must make choices they didn't make before – contribution level, investment choice if applicable etc and may make the wrong choices*
- ✓ *WW may reduce current employees' benefits they are entitled to, to make up the deficit in the DB fund when implementing the conversion*
- ✓ *Employees may be affected by future deficits (arising from administration issues/data errors etc) which cause a discrepancy between members' accumulated balances and accumulated aggregate asset values, where in the DB fund deficits were the responsibility of the employer to correct/make good.*

New risks to WW

- ✓ *Employees may be unhappy about the change*
- ✓ *Causing loss of employees to competitors*
- ✓ *Or employees may choose to make minimum contributions to their DC funds*
- ✓ *Reputational risk as a result, especially if employees now have relatively low benefits*
- ✓ *Significant costs and governance required to implement the transition from DB to DC, including actuarial fees/legal fees/administrator fees/system set up etc*
- ✓ *Regulatory risks associated with DC funds and new regulations that need to be complied with*
- ✓ *... including compliance with regulations associated with transition process from DB to DC*
- ✓ *Poor management of the DC fund, e.g. poor investment strategy or administration, lead to poor benefits or reputational risk*
- ✓ *Investment returns are crucial to providing future benefits to members – this needs to be managed appropriately likely with expert advice needed*
- ✓ *The company will have less influence over the retirement fund as a DC fund operates more like a stand-alone entity (this may be a risk or an advantage if the company wants to be rid of the responsibility)*
- ✓ *Lifestage and investment choice strategies, if implemented, require higher governance and introduce the risk of inappropriate options being offered to members*
- ✓ *Administrative risks*
- ✓ *Unitisation risks*
- ✓ *Timing delays*
- ✓ *Administration errors*
- ✓ *Tax implications*

[12]

[Total 16]

Marker comment: Being a reasonably straightforward question, all candidates were able to provide a few main points to both parts of the question. However, candidates need to be conscious of repeating points or ideas in different ways, as these do not earn marks.

QUESTION 7

i.

- ✓ ✓ Terminal funding would involve the employer making a lump sum available every time an eligible employee retires.
- ✓ ✓ This lump sum would be equal to the expected benefit ie the present value of expected future PMI premiums.
- ✓ ✓ Under regular contribution funding the employer would make contributions throughout each employees working lifetime
- ✓ ✓ with the aim of accumulating the expected cost of the benefit by the time the employee retires and the benefit becomes due.

Security

- ✓ Regular contributions involves the contributions being made earlier and hence is more secure
- ✓ But comes at an increased opportunity cost for the sponsor
- ✓ Particularly as if fewer than anticipated employees qualify for this benefit there may be surplus funds tied up that cannot be accessed by the employer.

Stability

- ✓ The question states the benefit has been offered “for many years”, hence one assumes this is a relatively mature arrangement
- ✓ And hence cashflows should be fairly uniform across both methods.
- ✓ However, as the group of covered employees gets smaller, the cashflows will become increasingly unstable.
- ✓ The terminal funding may be more stable as with regular contribution there is additional uncertainty over whether someone will claim or not.
- ✓ Leading to under or over funding in the case of each individual member.
- ✓ ✓ The fact that the scheme has been discontinued suggests that it was not sustainable given rising longevity
- ✓ And high PMI premium inflation.

Realism

- ✓ Although regular contribution funding will over, or underprovide on an individual basis, it will be more realistic than terminal funding over the full population.
- ✓ As terminal funding makes no provision for a possible future liability until that liability is certain.
- ✓ Regular contribution funding may ease liquidity constraints.
- ✓ And may have more flexibility.

[9]

ii. Define in words the Actuarial Liability (AL) and Standard Contribution Rate (SCR) for this employer for this particular benefit.

The AASCR, expressed as a percentage of earnings, is:

- ✓ the present value of all benefits that will accrue to current active members after the
- ✓ valuation date, by reference to service after that date [Note that no reference to earnings is required]

divided by

- ✓ the present value of total projected earnings for all current active members throughout their expected future membership.

The AAAL is:

- ✓ the present value of total benefits [not required - based on projected final earnings] for current active members in service
- minus
- ✓ the value of the SCR multiplied by the present value of total projected earnings for all
- ✓ current active members throughout their expected future membership.

- ✓ The AAAL can also be expressed as:
- ✓ the present value of all benefits accrued at the valuation date, [not required - based on projected final earnings] for current active members in service.

{1.5 marks for valid definitions + 0.5 for realising that the benefit itself is not linked to earnings.}

[3]

iii.

$$\frac{\sum \text{Future benefit accrual for member } i}{\sum S_i a_{R-x_i}}$$

- ✓ Where the summations are over all eligible members
- ✓ S_i represents the current earnings of member i
- ✓ R is the normal retirement age
- ✓ X_i is the current age of member i
- ✓ a_{R-x_i} represents an annuity certain with a term of $R-x_i$ years
- ✓ calculated at a discount rate that makes provision for salary inflation.

Future benefit accrual for member $i = \begin{cases} 0 & \text{where total service to retirement} < 20 \\ \frac{\max\{20-P_i, 0\}}{20} \times C \times \left(\frac{1+f}{1+i}\right)^{R-x_i} a'_R & \text{otherwise} \end{cases}$
 {one tick for getting the first case correct and two ticks for getting the second case correct}

Where

- ✓ P_i represents the past service of member i
- ✓ C is the current annual cost of PMI (rated specifically for member i if appropriate)
- ✓ f is medical insurance inflation expected to apply until the date of retirement
- ✓ i is the discount rate
- ✓ a'_R is a single life annuity paid from age R appropriate to life i but with the discount rate adjusted to allow for medical insurance inflation after age R .

[8]

[Total 20]

Marker comments: Parts (i) and (ii) of these questions were generally okay, however performance could have been better given the high lean towards bookwork. Part (iii) was not well done. Candidates struggled to organize the equation well and left out the context of the question when doing so.