

EXAMINERS' REPORT

May 2019 examinations

Subject F104 — *Pension and Other 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

i.

- Pooling their risks with others.
- each insured individual pays premiums into the pool, and those individuals who die – or more precisely, their beneficiaries – receive payments from the pool.
- A classic life insurance policy can be viewed as a vehicle facilitating pooling.

- Saving,
- where individuals reduce their consumption in good times,
- and save up resources that they can use to ensure that their consumption does not need to fall too drastically when times are bad.
- A classic **retirement fund** can be viewed as a savings vehicle.

ii.

- Myopia
- The suggestion focusses on the short-term at the expense of the long-term
- Since in the longer term low contributions may lead to insufficient benefits at retirement

- Loss aversion/Prospect theory
- The trustee may be avoiding a reduction in his/her own personal take home pay due to having to introduce a deduction for retirement fund contributions
- Even though there is a significant long-term gain in terms of retirement income.

- Hyperbolic discounting
- The trustee seems to believe that members might find it easier to increase contributions at a later stage – perhaps once they have experienced an increase in their income.
- In reality members are likely to continue to postpone making this change until it is too late.

- Availability heuristic
- May be thinking of his own likely behavior or behavior he has observed
- However, due to individual cognitive biases, the likelihood that this will actually occur is very low.
- Even in salaries are increased in real terms.

iii.

- Objective should be to maximize returns subject to an acceptable degree of risk
- May want to set a replacement ratio target for the retirement benefit
- This would be higher for lower-income earners
- These will inform level of growth vs capital preservation required/ risk may be defined as not meeting these targets
- Once the contributions rates have been determined, an asset-liability model can be constructed to help identify and develop the strategy that is optimal for achieving the target.
- Limitations imposed by regulation should not be breached.
- Costs involved in implementing and maintaining a strategy.
- Liquidity requirements to pay benefits at or before retirement.
- Including how risk benefits will be provided for (insured or from the fund).

- Although liquidity may not be too constrained for a newly established fund.
- Benefits at retirement could dictate asset structure at different ages.
- For example, if pensions will be paid from the fund, longer-term views can be maintained.
- Or if lump-sums are to be paid or transferred to annuity providers, cash and bonds might be favoured closer to retirement.
- Implementation of a lifestage strategy could then be considered.
- Should consider whether member individual choice will be made available.
- General member profile should indicate financial sophistication to make choices.
- Which would inform the number and type of options available.
- As well as risk appetite which will inform a default investment option.
- The size of potential membership will indicate whether in the long-term the fund can have a stand-alone bespoke investment strategy.
- Or rather form part of a pool of investments shared with other funds.
- Although initially the asset base is likely to be extremely small.
- And asset classes like direct property may need to be avoided.
- Administration capabilities should be considered, especially if regular switches are required or allowed.
- Structure and performance of other defined contribution funds with similar structures should be considered as a starting point.
- Tax implications of various strategies should be considered.
- Nature of the underlying liabilities is real, therefore there is a need to include real assets.

Students that knew their bookwork performed well in parts (i) and (ii) although the answers to part (ii) tended to be too generic. For part (iii) a number of obvious points were missed and candidates tended to focus on issues that would be considered after an investment strategy has been determined (i.e. implantation phase).

QUESTION 2

i.

- Pensioner mortality is lighter than anticipated
- Resulting in the main pension benefit being paid for longer than anticipated
- Spouse mortality is lighter than anticipated
- Resulting in the spouse's pension being paid for longer than anticipated
- Mortality for in-service members heavier than anticipated
- Resulting in more widow's and child's pensions being paid.
- Theoretically a risk of child mortality being lighter than anticipated
- Although most funds will assume no mortality under the age of 18.
- Risk is greater for larger benefits

ii.

- Firstly define a period of investigation long enough to have a reasonable number of deaths but recent enough to be relevant.
- Will need both exposure data and death data
- Divide data into homogeneous groups e.g. active members, widows of active members, pensioners, pensioner widows etc,

- then by age band and gender
- Taking care there is enough data in each group for the results to be credible.
- Crude mortality rates can then be calculated by taking number of deaths and dividing by exposed to risk
- Actual versus expected comparisons should then be made.

iii.

This is a derivative contract that offsets the risk of pension scheme members living longer than anticipated.

iv.

- A defined benefit fund will have an investment strategy that depends mainly upon the nature and term of the liability.
- Implementing the longevity swap brings about greater certainty with respect to the term of the liability
- As the fund will effectively swap their actual pension payments for their expected pension payments
- Traditionally bonds and inflation-linked bonds are used to match pension outgo
- Although there may be some equity exposure already to provide for pension increases
- The swap reduces the reinvestment risk associated with buying and selling bonds to better match unpredictable cash flows.
- Once the swap is in place there may be room to invest in less liquid assets
- Such as property or private equity that could boost returns.
- The reduction in timing risk may allow the fund to mismatch more and reduce bond exposure.
- Higher investment in real returning assets, like equities, could be employed in an effort to improve the level of increases offered to pensioners.
- However, the trustees will probably want to limit the degree of mismatching so that pensioners reasonable expectations can be met with regard to the pension increases
- The longevity swap is likely to introduce some credit risk
- Which may lead to an increase in the level investment in government stocks (or similar) to even out that risk.
- Having certainty around cash inflow and outflow will allow the fund to hedge currency risk
- A greater level of overseas investment can be achieved as a result.

In part (i), many candidates focussed on consequential risks like liquidity and solvency risk as opposed to the mortality risk that was asked for. Answers were sometimes poorly expressed and other demographic risks were cited, e.g. having a young spouse as to the mortality risk that mortality may be heavier than expected among people with young spouses.

Part (ii) was bookwork and generally well done if not very well applied.

Part (iii) was bookwork that was poorly done as candidates had clearly not learned the glossary definition.

Part (iv) was done well by candidates who started from first principles, in other words the objective of the fund and how this changes, if at all.

QUESTION 3

i.

- Relevant legislation and professional guidance notes
- Latest fund rules including any amendments to the rules
- Minutes of trustee meetings and other resolutions
- Established practices of the fund (for example, discretionary benefits)
- Member booklets and other member communication
- Accounting information such as audited financial statements and investment statements.

ii.

- Accrued methods target a level of funding
- The SCR is set at a level to maintain the funding target
- And can be modified at regular intervals (control period) if experience doesn't follow the model.
- The liability is the discounted value of benefits that have accrued over past membership.
- Prospective methods target a stable contribution rate
- That if paid over the entire membership of a beneficiary
- Will accumulate with returns to the value required to finance the accrued benefit.
- The liability is the difference between the discounted values of the total expected benefits and the future contributions.

iii.

$$\text{AASCR} = \frac{\frac{(65-46) \cdot 600\,000 \cdot \left(\frac{1+7.4\%}{1+10.2\%}\right)^{(65-46)} \cdot 12.276}{60}}{600\,000(15.14277984)} = 15.74\%$$

$$\text{PUSCR} = \frac{\frac{(3) \cdot 600\,000 \cdot \left(\frac{1+7.4\%}{1+10.2\%}\right)^{(65-46)} \cdot 12.276}{60}}{600\,000(2.924420539)} = 12.87\%$$

iv.

- The AASCR is higher than the PUSCR
- The AASCR represents the flat contribution rate that would be paid over the future lifetime of the member.
- The PUSCR on the other hand is meant to be recalculated after each control period.
- In a closed fund (or any other fund where the membership is aging)
- ,the PUSCR would start off lower and end up higher than the AASCR
- Even though the liabilities under the two methods are the same.

Candidates performed poorly on this question in general but performance was worst on the calculations in part (iii). Parts (i) and (ii) were considered to be bookwork, however candidates were unable to generate enough points in part (i) and were too vague in part (ii). Part (iv) was well done, even where

candidates failed to complete the calculations correctly, the comparison between the methods was correct.

QUESTION 4

i.

- The actuary usually plays a role in retirement fund matters via statutory certification requirements
- that are usually governed by legislative provisions.
- There is also usually extensive professional guidance issued by the local actuarial profession with which actuaries must comply.
- Actuaries may also be required to act as a whistle-blower if they observe, for example, breaches of regulation and legislation that may materially disadvantage a stakeholder, particularly beneficiaries.
- More recently, actuaries may consult on a broader range of issues including
- the adequacy of contributions, insurance arrangements, investment strategies, appropriate defaults and even member communication.

ii.

- The purpose of the statutory actuarial valuation is to demonstrate solvency to the regulator
- Hence stringent checks are likely to be applied
- Financial statements are likely to be prepared more quickly
- And close on a specific date meaning transactions after the closing date are not taken into account
- The assets in the financial statements could account for investments that are not allowed in terms of valuation legislation.
- There could be an error in one of the results
- For example unit price adjustments to the last day of the year end might not have been implemented.
- The statutory actuarial valuation will take into account any guarantees
- The statutory valuation may include provisions or reserves that have not been updated in the financial statements,
- For example an investment or risk reserve.
- Or any guarantees

iii.

- Longevity risk
- Applies to guaranteed annuities and not income drawdown accounts
- Manage via purchase of insurance policies within the fund
- Or by offering an income drawdown

- Expense risk
- In a DC fund expenses are generally controlled. Introducing in-fund annuities brings in additional expenses that might be difficult to forecast.
- Manage expenses via good governance and reporting.

- Solvency risk
- In-fund annuity might bring an implicit guarantee into the fund that may not usually occur in a DC fund. There is a risk that assets fall below the guaranteed liability levels.

- Manage via regular valuations
- Funding risk
 - If there is a guarantee e.g. the life annuity, there is a risk that whoever funds is unable to do so
 - E.g. if the employer, the employer may not have the funding available when required
 - Manage by regular reporting to the employer, in this example
 - And avoiding guarantees
- Operational risk with respect to annuity type arrangements
 - The administrator may be inexperienced with administering annuity type arrangements and the record keeping required.
 - Manage via good data collection and data preservation
 - Appoint a service provider familiar with this type of benefit
- Advice and communication risk
 - Opt-out structure may create an obligation on the trustees as representatives of the fund to communicate the risks relating to the in-fund options. May be held responsible for poor choices.
 - Obtain assistance of financial advisors
 - (although this may increase costs which may defeat the purpose of the exercise)
- Adverse selection
 - Healthier retirees may choose life annuities while those in poor health choose drawdown products if both are on offer.
 - Life annuities can be underwritten by an insurer or not offered.
- Counter party risk
 - Introduced if an insurer underwrites pensions paid by the fund
 - Insurers can be selected from an eligible panel that meet specific minimum requirements.

In part (i) most candidates failed to distinguish between a role and a duty and failed to score high marks as a result. In part (ii) candidates defaulted to DB arguments of assumptions and methods differing which was not considered relevant in the DC context. Part (iv) was better handled although risks like liquidity and investment risk were not accepted since they are a part of the accumulation phase in a DC fund.

QUESTION 5

i.

- Workers cannot choose to reduce their contribution to the Pillar 1 scheme.
- However, employees with employers with schemes might simply choose to reduce contributions to the company scheme where possible.
- Or choose to leave the voluntary schemes entirely.
- If there are limits as to how much one can save with the new savings account then overall retirement savings could decrease for this group.
- The self-employed would not have access to the employer schemes so the new products may increase their retirement savings.

- Alternatively, savings may be redirected from non-retirement savings vehicles to the new savings account which may keep overall savings levels neutral.
- It's also possible that with the right incentives retirement savings may increase.
- For example tax incentives on contributions

ii.

- The supply of capital would increase
- Which would decrease the cost of capital i.e. interest rates
- This would increase demand for capital by companies
- Increased capital could make workers more productive which would then increase wage rates.
- It would also encourage businesses to become less labour intensive which would decrease wage rates
- The overall effect on wages is unclear as it depends on the interplay between these two factors.

iii.

- The state could offer cash incentives on the new product,
- Or tax relief on
- Contributions
- Benefits
- Investment income
- Or growth
- tax-free
- or at a reduced rate
- The state could use behavioural incentives like auto-enrolment
- The state may in theory offer guarantees on investment returns...
- The state may encourage take-up by regulation of the new product to encourage peace of mind for investors.
- Education may be provided.

iv.

- The means-test should result in the Pillar 0 benefit being paid to fewer people.
- Which should reduce the burden on tax-payers.
- This may allow for taxes to be reduced
- Which will be politically favourable
- Although the cost of tax incentives depends on extent of relief (i.e. tax-free or at a reduced rate)...
- this may be partially offset by the cost of administering the means-test
- ...any limits on the relief
- For example on contributions only up to a certain percentage of income
- ...and the take-up of the new product
- Guarantees on investment returns is likely to be too expensive for tax-payers
- Auto-enrolment would involve minimal costs to the taxpayer
- The cost to the taxpayer of regulation will depend on the overall regulatory framework of the country e.g. general vs market-specific...
- ...and the degree of oversight
- For tax-payers investing in the new product who benefit from this encouragement, there may be a net benefit
- While those who do not invest will lose overall
- More redistributive as the needy are targeted

Part (i) was surprisingly poorly done as many candidates ignored the existing savings vehicles available. Part (ii) was a bookwork application. Some candidates had clearly learned this section and others had not. Part (iii) was generally well done although candidates should note the difference between compulsion and encouragement. In part (iv), many candidates chose to focus on the saving rate (although this had been well covered in previous parts to the question) as opposed to looking at the tax burden and benefits experienced by taxpayers.

QUESTION 6

- Needs of various stakeholders
 - What does the employer want to achieve in offering this new type of fund?
 - What is the balance between risk benefits, retirement and housing required by different members?
- Contributions
 - This new type of fund combines saving for a house with saving for retirement and hence would require relatively high contribution rates for both goals to be achieved.
 - It would be important to model the required contribution rate individually given that housing costs could be vastly different. How much flexibility in the overall contribution rate would be allowed?
 - Industrial employer so many workers would be blue-collar and may not be able to afford high contributions.
 - Contributions to the housing account may need to be very flexible to allow for changes when the interest rate changes.
 - Contributions to the retirement account may need to be flexible to keep overall contribution rates steady.
 - Where will the employer contributions, if any, be directed?
 - Is there a desire to be paternalistic and set a minimum contribution rate towards any element or elements in the fund?
 - Will the employer try to encourage saving by matching?
 - Or just pay a level contribution?
- Benefit level
 - What other retirement, housing and risk benefits will members have access to?
 - Does the employer want to meet these needs partially or fully?
- Eligibility
 - Will the new fund be compulsory or voluntary?
 - Costs may be quite high so does it make sense to enrol members with short service?
 - Are there lifecycle considerations? At what age do people typically start saving for, and paying off, a home?
 - Industrial so there may be a large number of shift workers, may want to exclude those with low hours worked who may not be able to afford high contributions this scheme may require
 - Should the company use different categories to deal with different needs, which is cheaper but may appear to be discriminatory?
 - Or allow for flexibility?
- Expenses
 - Will the costs associated with having one particular account be borne by members who don't use the facility?

- Percentage of assets, percentage of salary or flat rate?
- What degree of cross-subsidy is desirable?
- Risk benefits
 - What sort of risk benefits will be offered? Disability? Death?
 - Income or lump sum benefits?
 - Offer flexibility as to level of benefits?
 - May meet needs better but is likely to be expensive due to anti-selection.
- Normal retirement age
 - What is desirable from an employment perspective?
 - Consider current retirement age in company
- Transitional arrangements
 - Is there an existing fund – likely as company is established?
 - If DB, how will transfer values be calculated?
 - Will members have the option of remaining in the old fund, particularly if close to retirement?
 - Will members have options as to how the transfer value is applied in the new fund, e.g. split between retirement and housing accounts?
 - Other
 - Does the employer want to offer any guarantees e.g. on investment returns?
 - Penalties, e.g. for favouring one account over another
 - How to prevent fraudulent use of the housing account?
 - Any regulatory restrictions

There were plenty of marks available and some candidates scored well despite limited application to the circumstances of the question.

QUESTION 7

- Assume that both funding methods are allowed by regulation.
- Statement 1:
- Cost of the benefits remains unchanged as this is not determined by funding method
- Investment return must be considered against the cost of borrowing ...
- Or the opportunity cost of not investing in the business.
- Statement 2:
- If the DB fund pays out a lump sum benefit then it will be possible for the contribution to equal the benefit
- However, if the fund pays a pension/income benefit, then the cost of the benefit will not be known until the last pension payment is made
- The ability to never over-contribute is desirable if there are restrictions on how surplus in a fund can be used (which can be a risk to the employer)
- And an under contribution could result in the employer having to find money to fund benefits at an inopportune time.
- As long as there is a time delay between the payment of the contribution and the benefit being paid, there will be a need to monitor.
- Stability of contributions
 - This will depend on circumstances as if the company expands rapidly and hires workers of different ages, lump sum in advance will produce less stable contributions than terminal funding....

- ...or vice-versa if the company retrenches workers
- The ability to control the timing of the contributions will also influence stability.
- Timing of the contributions for lump sum in advance can be controlled by the employer through the hiring policy...
- Unlike in terminal funding when the member may be able to choose when they retire...
- ...subject to any restrictions in the rules or incentives/penalties imposed by the employer...
- Or may exit the fund for another reason at a time that is difficult to predict...
- ...e.g. withdrawal (most likely) or death.
- The stability of contributions will reduce the risk of the employer having to provide funding at an inopportune time.
- Realism and
- Liquidity
 - If there is no recognition of prior service then, benefits will build up slowly.
 - Lump sum in advance will result in a large initial cash outflow which will then stabilise.
 - Terminal funding will result in small payments initially which will build up.
 - Neither will give a realistic cost...
 - ..but with terminal funding there risk that the employer may be overly generous with benefits and increase the overall cost.
 - But Lump Sum in advance poses a greater liquidity risk.
- There may be tax and accounting advantages to a given method
 - E.g. in terminal funding there may be a large deficit that needs to be disclosed in the accounts
 - With lump sum in advance there is a risk that contributions exceed the maximum permissible deduction for tax purposes

Some candidates missed the point that the pace of funding is distinct from its cost. Others had the right idea but failed to generate enough points. This is a reasonably common exam question when comparing two regular funding methods so was not beyond the grasp of a well-prepared candidate. Some candidates wasted time talking about risks to the member.

END OF EXAMINERS' REPORT