EXAMINERS' REPORT

November 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.

- The major risk to the government is that more benefits are paid
- For a longer period than initially anticipated.
- There is a risk that disability inception rates are thus higher than anticipated
- And return to work/ recovery rate are lower than anticipated.
- The claims inception rate may be higher if the mortality rate in the healthy population is lower than anticipated.
- And payment periods may be longer than anticipated if the mortality rate in the disabled population is lower than anticipated

ii.

- Market structure and product provision:
- The state may either design the framework within which the private sector operates, or provide products itself.
- Product regulation:
- This can either be done at the buy side (individuals may not purchase products that do not comply with certain standards) or
- at the sell side (providers may not sell products that do not comply with certain standards).
- Market conduct regulation:
- The state may regulate the relationship between financial product providers and their customers and service providers.
- Prudential regulation:
- Regulation regarding the solvency of financial product providers that also serves to maintain the stability of the financial sector of a country.
- Mandatory insurance:
- The provision for the failure of financial product providers.
- There should be a close relationship between prudential regulators and these insurance schemes to protect the solvency of these arrangements.

iii.

- Relatively few people are ever expected to claim benefits so the proposed system may result in higher tax collections for the government.
- The tax-free benefits are favourable to a vulnerable group and hence may be viewed as politically favourable.
- However, generally the benefit is meant to be less than the salary of the person before disability
- and a sudden change to the tax regime may create a situation where one earns more on disability than at work.
- This creates an incentive to claim on the disability policy.
- Generally only a problem on existing contracts as new contracts would be structured to take account of the new tax system.
- Loss of tax exemption on contributions may be less appealing to the general public who could use policies to lower their tax rate.
- May result in a loss of private sector coverage.
- All other things being equal the change will result in tax being collected earlier.

All parts of this question were generally well done. Part (ii) was a bookwork question. Candidates that performed poorly either didn't answer the question or did not know their bookwork.

QUESTION 2

Time period

- Judgement is also required in setting the time period for the exercise. Given changes in capital markets a long-term projection may not be too informative.
- But contribution rates are only calculated every 3 years so too short a period is not practical.

Objectives

- Actuarial judgement is needed to help specify and clarify the objectives
- These should ideally take in the views of multiple stakeholders and not just the employer.
- An example of a suitable objective in this exercise may be keep the modified contribution rate calculated using the Attained Age Method within 2% of current levels with 95% certainty over the next 12 years.

Assumptions

- Best estimate assumptions are required for the projections ….
- and an appropriate basis is also required for the statutory valuation results.

The direction of the business will need to be taken into account

- for example, in the new entrant assumptions.
- The actuary will need to also consider whether the fund will remain open to new members.

Simplifications and simulations

- Judgement is required when deciding what simplifications to use
- Which will reduce computing time and cost
- Similarly, the actuary will need to determine how many simulations are required for the desired degree of accuracy.

Results

- The ALM may suggest certain investment strategies as optimal but these are only optimal in the context of the model and the actuary is required to help interpret the results.
- The actuary will need to ensure proposed strategies look sensible given uncertainties around the model and assumptions.
- The results may need to be adjusted for corporate accounting considerations…
- Or to allow for discontinuance
- There may be practical considerations e.g. difficulties in disposing of physical property
- Generally want only a gradual change from the current investment strategy
- Need to take the views of different stakeholders into account here too…
- Member groups may want to avoid certain investments for ideological reasons…
- Sponsor may want to avoid investments in direct competitors

The question asked specifically about areas where the actuary's judgement were required. Comments that were little more than describing a duty or process did not gain credit.

QUESTION 3

i.

- Usually a regulatory requirement
- Monitoring of actual versus expected experience is a semi-independent check on the valuation results.
- Assessing changes in the financial position will help to recognise reasons for unexpected developments
- And allow one to consider the likelihood of future similar events
- And advise the client on risk management strategies that may need to be implemented.
- An assessment helps to identify the most financially significant assumptions e.g. if self-insuring (must have example as generally not true for DC)

ii.

- Membership data at the current date and the date since the excess assets have arisen.
- Contribution rates
- And a breakdown of how contributions are allocated between risk, expenses and retirement
- Salaries over the period
- Benefits paid over the period
- Reinsurance premiums paid
- Expenses paid
- Reinsurance proceeds processed
- Additional voluntary contributions received
- Investment data e.g. investment returns and asset listings
- Accounting data/Working papers of the financial statements (if available) (not financial statements, which are information)
- Tax payments (if applicable)
- Transfers in or out
- Benefit changes over the period.
- Cash flows and investment returns related to reserve accounts.
- Previous valuation report.

iii.

- Perform data checks to ensure the data you have available to you is correct e.g. checks for unusual values
- Start with a membership reconciliation since the previous valuation date to ensure that no member liabilities have been excluded.
- Do a build-up of member shares as per the rules of the fund
- The member shares on the administration system should be reasonably close to the calculated shares.
- If they are not a more detailed check should be done to determine if there has been an administration error.
- Check that, for members who exited the fund due to death or disability, the insurance benefit has been duly paid to them.

- Work with the nominal return earned versus allocated to determine whether return distribution occurred properly.
- Check the previous valuation report to see if any provisions were set up that might not be evident from the financial statements.
- Determine how many staff members requested additional contributions be made to their member share
- Excess assets may indicate that the contributions were made but not allocated to the member shares.
- Compare the nominal income from contributions towards risk and expenses
- To the nominal outgo of the charges made to the fund.
- Charges may have reduced due to lower turnover or reduced risk benefits resulting in unallocated and unspent money.
- Establish a revenue account to determine if any large inflows occurred that should have a liability attached
- For example, transfers from other funds.
- Consider whether there was a surplus at the start of the period and the impact that would have had.

iv.

- The suggestions have merit in that leave days cost the company money in the form of reduced overall productivity.
- The equivalent amount of money could be contributed towards the members retirement share in lieu of the leave day(s)
- In terms of managing operational risk, the employer may want the member to take a minimum number of leave days
- And taking too few leave days may increase stress which would increase mortality and morbidity risks
- Which may then increase insurance contributions if experience rated
- Having ad-hoc contributions in this manner will require a greater amount of administration
- The cost of implementing this should not outweigh the benefit of doing so
- Members may fail to see the value in this since most people prefer instant gratification of leave
- Although it may appeal to older members

Performance on this question was average; the better candidates stood out. Part (ii) in particular was answered well and candidates who followed a logical approach managed to score most marks in part (iv).

QUESTION 4

i.

- Baseline strategic allocation
- In both funds the objective is likely to be to maximise return subject to an acceptable degree of risk
- In the DB fund, the strategy is likely to be based on asset-liability matching to manage solvency risk
- The pensioner liabilities are very long term and are likely to be linked to inflation in some way
- The DB fund will look to invest in more nominal and inflation linked bonds to match the pensioner liability.
- For active members, the liabilities will increase with salary inflation.
- So, investment in traditional high return assets (equities or property) is likely also required.
- The degree of mismatching in the DB fund may depend on the solvency of the fund.
- In the DC fund, members bear the investment risk and hence strategies like member choice and lifestaging may be used
- The employer takes the risk in the DB fund and so the strategy may be lower risk compared to the DC fund.
- But this will depend on the risk appetite of the members in the DC fund.
- The investment strategy in the DC fund is likely to have a higher weighting towards high returning assets,
- due to younger membership
- If there is a lifestage strategy there will be some cash and bonds in proportion to older members.
- If choice is offered in the DC fund, one would still expect this sort of asset allocation, however the asset allocation could be very different.

Liquidity risk

- The DB fund is likely to be a net payer (net negative cash flows).
- More liquid assets will be required to protect against liquidity risk.
- Bonds and cash may feature more than in the DC fund.
- Since the fund is open to new members who are likely to be younger with more risk appetite.
- Since the DC fund is open it will have higher net cashflows (or less negative cashflows!) and liquidity assets will play less of a role

Legal form

- Given that the DC fund is larger, it is possible that it may have a segregated portfolio.
- Whereas this is unlikely to be economical for the smaller DB fund.
- However, this is only possible if the DC fund asset base is extremely large.
- And is unlikely if investment choice is offered.
    - Other reasonable points relating to investment style (active vs passive), level of deviation from the baseline strategy etc allowed.

ii.

- Desired retirement benefit
    - Annuity, living annuity or cash

    - May want to match as member approaches retirement age
- Term of investment
    - Higher equity at younger ages where there is generally higher risk tolerance
    - Likelihood of withdrawal
    - And how much will be withdrawn
    - These may well be a function of how easily the person expects to find another job to replace their earnings
    - Will influence liquidity
- Risk tolerance
- Size of the assets being transferred
- Regulation allowances
- Tax implications – depending on the tax legislation, some strategies may be more tax beneficial than others
- Expenses involved (active vs passive management, size of investment etc)

Both parts of this question were generally well done by most candidates. There were many marks available in part (i) and most candidates scored well even though none considered the legal form of the investments.

QUESTION 5

i.

Pillar 0: Benefits are non-contributory and provided by the state. They are funded from general taxation and are aimed at alleviating poverty.
Pillar 1: A contributory, mandatory pillar operated by the state. Benefits are funded from contributions, which are linked to earnings.
Pillar 2: A contributory mandatory pillar operated privately.
Pillar 3: A voluntary benefit that allows individuals to tailor benefits to their own needs.
Pillar 4: Termed the non-financial pillar and covers access to informal support (family, social programmes, non-financial assets).
The state-provided paid maternity leave falls under Pillar 0. The employer-provided maternity leave is Pillar 3 and the 'mums-and-babes' group is Pillar 4.

ii.

- The country may have a low birth rate which the state wants to raise.
- This counteracts the effect of increasing longevity.
- And ensures that there will be a large enough workforce in the future to provide a sufficiently large tax-base to fund other Pillar 0 benefits.
- It prevents schools and playgrounds becoming redundant
- It is likely to be popular with voters and women in particular
- Other reasons include:
- The maternity benefit is likely to be redistributive
- It caters for behavioural biases like myopia in that people might not save for a protracted period off work.
- Externalities: It allows women to stay at home with their infants which may encourage behaviour like higher breastfeeding or vaccination rates which reduces the burden on the healthcare system.
- This sort of benefit cannot be provided for privately due to asymmetric information.
- The state may believe it is more efficient at providing this benefit than employers
- The state may have provided maternity benefits for a long time
- There may be external pressure to provide these benefits.

iii.

- Could have higher fertility than anticipated.
- This could result in the government facing increased costs in terms of healthcare and schools.
- If this increase in fertility is not sustained then there will be a population bulge, which could create an unemployment problem in 20 years' time or an old-age dependency problem in 60 years' time
- Fertility could be lower than anticipated
- Resulting in high old age dependency ratios
- May make pay-as-you-go benefits for the elderly unsustainable.
- And make the tax-base too small for other government projects.
- There may be some wasted overheads for the mums-and-babes groups

There were plenty of marks on offer. However, part iii was not well done. Candidates neglected to discuss the effect of demographic changes on state systems. Many made the assumption (strangely) that these were the only benefits in that country.

QUESTION 6

i.

- Identify the needs of all stakeholders, particularly the members and the sponsor.
- Identify the risk factors for the different parties involved.
- Carry out cost-benefit modelling of various design possibilities.
- Consider practicalities such as administrative implications, legislative constraints and the need for expertise.
- Consider ethics and soft issues for example the impact of the proposed design on public perception and behaviour.
- Consider the transitional arrangements
- Finalise and review – compromise is likely to be necessary.

ii.

- This design usually involves a minimum level of "core" cover that all fund members have, and members can then buy additional "flexible" cover. Both the core and flexible levels will need to be determined by the trustees.
- They will want to avoid members being underinsured and their risk needs not being met
- As well as avoiding over-insurance which would result in the contribution towards retirement funding being too low.
- Too many levels of flexible cover may also discourage choice
- Due to anti-selection risk this design tends to be the most costly for the cover obtained, disadvantaging all members
- And members may need to provide evidence of health to obtain more cover
- Or wait for specific life events
- So, it can be very difficult to rectify an inappropriate choice
- It would be more difficult for members to understand.
- This option introduces the risk that members make the wrong choice
- And likely require increased levels of communication and management by the trustees
- This would be more administratively complex (possible increase other costs).
- Increased communication could also increase costs
- Increased costs result in members' retirement needs not being met

iii.

- It is not unexpected that the total expenses being incurred by the fund are higher than the contribution towards expenses
- Since the contribution towards expenses covers only the administration and insurance expenses.
- Other expenses such as consulting, actuarial, investment management fees and audit fees still need to be paid from the fund.
- The design is sensible in some ways in that expenses like insurance are likely to be charged as a percentage of member salaries
- And investment fees are almost always a % of assets under management
- However, the level of the charges would need to be checked and revised regularly to ensure an appropriate level of collection.

- For example, if the annual review of the charge on the member contribution occurs at a different time to the annual review of the group assurance benefits and the administration, the two could become unmatched.
- Deducting those expenses in a similar was is administratively simple and avoids cross subsidies for that particular expense.
- However, the % of salary charge for administration may be a poor match as administration is usually a fixed amount per member per month.
- And similarly, for the ad-hoc expenses.
- A fixed charge per member per month would be a better match
- When ad-hoc expenses are deducted from investment return, the rand value affect is larger for members with larger accumulated shares in the fund.
- As a result, members with large balances subsidise members with smaller balances
- Larger balances would be associated with members with longer service or higher salaries
- Similarly, members with higher salaries subsidise members with lower salaries on the ad-hoc fees.
- These cross-subsidies could be considered fair (redistributive) or unfair.
- An expense strain could arise then if the mix of members is different to what was expected when setting the deduction levels e.g. fewer higher earing members
- If there are large numbers of unclaimed or paid up benefits that do not draw regular contributions, there may be a systematic under-recovery of administration and ad-hoc costs
- These members would not have risk cover.
- There is at least some contribution towards costs from these benefits by reducing investment return.

Part i was bookwork and generally well-answered. In part ii, candidates failed to discuss issues relating to choice in retirement funds generally and features of a "core-and-flex" system in particular and lost marks. Part iii was very poorly handled. Very few candidates picked up that there was a second expense charge at all and most commented simply on administration and risk costs. As a result, they did not generate the points around expense matching.

QUESTION 7

i.

With regular funding,

- assets are explicitly held by the pension fund in order to meet the fund liability. These assets are ringfenced from the employer's assets.
- If the liabilities exceed the assets held then (depending on the accounting standards), the shortfall is shown as a liability on the employer's balance sheet.
- The fund will have its own investment strategy which usually limits the extent of investment in the employer.

With book reserving

- There are no explicit segregated funds set aside to meet the fund liability.
- Instead there is a provision on the employer's balance sheet for the liability (in excess of assets held, which is zero) like with regular funding.
- If the book reserves are calculated annually, this is similar to a 100% investment in the employer.

ii.

- In order to minimise the amount that they pay for ET, Big Corp will want a high liability value.
- Statutory actuarial liabilities are usually calculated on a prudent basis which results in a high liability value.
- So using the statutory valuation will meet the aim of having a high liability value.
- And it will save time and money.
- However, this is a negotiation and the value may be too prudent for JKI to accept.
- The statutory actuarial valuation may also not be appropriate, for example if it calculates the liability based on ET being a going concern and Big Corp plans to liquidate ET then a discontinuance basis may be more appropriate.
- In this example, the statutory actuarial liability may not be prudent enough and any shortfall in assets would need to be met by Big Corp.
- On an ongoing basis, Big Corp will be interested in the liability value that will need to be shown on its balance sheet
- And the regular contribution rate required
- The former will be dictated by accounting standards which may set out a valuation method and basis which may be less prudent than the statutory valuation basis.
- Regulations are likely to dictate the latter which may be subject to a minimum of the statutory valuation contribution rate.
- The statutory valuation result may be out of date however as such valuations are typically required every few years.
- And if ET's results have been poor, there may have been a number of exits on the fund with very few new entrants.
- This may change the liability value substantially depending on the extent of the shrinkage and the change to the average age on the fund.
- In addition, other aspects of the basis such as the discount rate may now be inappropriate.
- A liability value as at a specific date may well be required as well as projected liability values and contribution rates over a number of years.
- There may also be ethical considerations. Using a high liability value to negotiate a sale price if Big Corp plans to use a lower liability value in terms of company provisions on the balance sheet may be viewed as unethical as the high liability value implies greater security for members at sale stage which is then reduced once the deal is done.
- The strength of the sponsor covenant will be of particular concern given that ET has had poor financial results in recent years.

iii.

$$AASCR = \frac{\dfrac{(R-x)\times S}{A} \times \left(\dfrac{1+e}{1+i}\right)^{R-x} \times a'_R}{S \times a_{\overline{R-x}|}}$$

Where

$a_{\overline{R-x}|}$ is an annuity certain calculated at an effective interest rate of (1+e)/(1+i)-1.

Assume contributions are paid annually in arrear

Effective interest rate is 4%.

AASCR = 18.776%

$$AAAL = \frac{(P+F)}{A} \times S \times \left(\frac{1+e}{1+i}\right)^{R-x} \times a'_R - SCR \times S \times a_{\overline{R-n|}}$$

Where

F is future service (R-x)

AAAL = R110 946 070

iv.

- If the same basis is used it is true that the CUAL is less than the AAAL.
- And JKI will want a low liability value for ET for the negotiations which may make the CUM desirable.
- It is also true that discontinuance valuations are typically performed using the CUM.
- However, if ET is to be sold as a going concern the CUM in general is not particularly realistic as it does not allow for future service or salary growth.
- Discontinuance valuations in particular tend to use a very conservative basis in order to provide good benefit security.
- This tends to result in a high value for the liability.
- Hence using a discontinuance valuation may neither be realistic nor in JKI's interests

Parts i and iii were well done. In part ii, many candidates demonstrated a lack of understanding around mergers and acquisitions. No candidate considered accounting implications or what Big Corp might be interested in beyond price. Part iv was in part straightforward bookwork but candidates struggled to communicate whether this sort of valuation would make sense in a merger and acquisition scenario.

END OF EXAMINERS' REPORT