

Actuarial Society of South Africa

EXAMINATION

27 May 2013

**Subject F204 - Pensions and Other Benefits
Specialist Applications**

MARKING SCHEDULE

QUESTION 1

i) Briefly set out the legislative framework that needs to be taken into account when setting the investment strategy

- Pension Funds Act, Pension Fund Circulars
 - Duties of trustees to act in best interests of members
 - Fiduciary responsibilities to look after the investments
 - Delegate responsibilities appropriately
 - Seek appropriate advice
- Regulation 28
 - Requirement for Investment Policy Statement
 - the maximum amount of the fund's assets to be invested in a single assets
 - the maximum amounts per various asset classes,
 - the use of derivative instruments such as futures and options and structured products,
 - overall exposure to offshore assets.
- Investment strategy document
 - there is a defined process for investment planning and decision making,
 - there are structures for monitoring investment performance,
 - demonstrates due diligence by trustees,
 - guides asset managers on strategies and scheme's risk tolerance
 - Communication with members

ii) Explain to the Trustees what Asset Liability Modelling is and describe how you would use this to assist in determining an appropriate investment strategy for their Fund

Explain:

- ALM uses a stochastic model to generate economic cash flow elements
- Across all asset classes
- Based on underlying expected distribution of the returns for each class
- On asset side you can generate a range of likely outcomes from a range of investment portfolios with varying combination of asset classes
- This is then compared to a range of generated liabilities
- Liabilities typically generated on deterministic basis

- But can generate based on asset output relative to some target (Net Replacement Ratio) including range of likely outcomes from stochastic returns

Use in DC

- Within the DC arrangement the best use is to assist in identifying the portfolios that would give the greatest probability of meeting a desired retirement target
- Defined relative to the Net Replacement Ratio
- Allows for wide range of investment portfolios to be constructed based on varying combinations of asset classes where the expected returns from the various asset classes have been stochastically determined
- Can be used to model single absolute return type balanced funds and can be used in life stage context
- Demonstrate to the Trustees how a range of portfolios with different target asset allocations would achieve the desired target and risk accepted
- Assist in adjusting the lifestage portfolio both in terms of the portfolios applicable to the various stages as well as the transition from stage to stage and the period before retirement over which the transitions could be made
- Shows both the probability of reaching the desired target as well as the range of risk that will be accepted during the build up to that target
- Can be used by Trustees to refine the investment strategy that balances the likelihood of reaching the target subject to acceptable levels of risk
- Can assist in understanding the impact of various factors on the desired target:
 - Contribution rates
 - Retirement ages
 - Working/savings periods
- [Bonus for all additional reasonable suggestions or explanations]

iii) In the context of the investment objectives of a defined contribution pension fund discuss each of the above statements

Trustee A

- Return on index-linked bonds depends on the market value at particular points in time
- which will be affected by supply and demand
- and any changes in the real yield over time
- Hence return does not necessarily match inflation unless held for full term
- And is unlikely to match salary inflation
- Despite growth the market in index-linked bonds demand still exceeds supply affecting trading

- For DC arrangement members need their own investments to deliver inflation and salary inflation beating returns in order to increase real level of savings and ensure achieving appropriate retirement (NRR) targets
- May be appropriate at retirement for those wishing to buy inflation linked annuities

Trustee B

Bonds

- Suitable for matching liabilities fixed in monetary terms
- but not salary related liabilities
- In DC fund members need to achieve an appropriate net replacement ratio therefore affected by growth in salary level to retirement
- Returns achievable will be guaranteed only if held to maturity
- Potential for returns to be eroded by inflation (or negative) so while actual return may be positive the real return needed to achieve desired retirement targets may be negative
- At retirement may be an suitable option only if purchasing a guaranteed level annuity

Cash:

- Returns likely to meet but not beat inflation over the longer term
- Positive returns guaranteed but real returns relative to salary inflation could be negative
- Achieving the desired NRR unlikely
- At retirement cash may be suitable if purchasing a with profits annuity or to meet cash lump sums

Trustee C

100% equity:

- Over the long term likely to produce returns that exceed inflation and salary inflation
- But with significant volatility that may not suit members
- Offering a real return that could assist in achieving the desired NRR targets
- Regulation 28 issues as REG 28 to be applied at both Fund and member level limiting total equity to 75%
- If permitted a reasonable proportion of equity held to retirement would be suitable for a living annuity with sufficient term post retirement
- In addition to Reg 28 limits there may be other investment classes that provide similar long term inflation protection and hence equity better suited in a balanced arrangement with appropriate inflation beating diversification

Cash:

- Returns likely to meet but not beat inflation over the medium to longer term
- Again positive returns guaranteed but real returns relative to salary inflation could be negative
- but over the short term close to retirement will protect against volatility
- 5 years may however be too far and some staggered approach may be more suitable to avoid real return losses
- At retirement cash may be suitable if purchasing a with profits annuity or cash lump sums
- Plans change, member may not know when 5 years prior to retirement is

iv) Explain how the available range of asset classes generally available for a retirement fund can be combined within a suitable investment strategy for the Fund

- The trustees should consider the following asset classes, subject to overall investment objectives and risks
- The objectives to achieve a desired net replacement ratio require long term returns that can beat salary inflation
- Under the DC arrangement cognisance must be taken of the intended post retirement annuity vehicle to ensure some match prior to retirement
- Depending on the desired/default or most appropriate annuity product the investment strategy can be adjusted leading to retirement either through investment choice or a continuous monitoring of the overall portfolio relative to the membership
- Assume with profits annuity (any option appropriate as long as reflected below)
- SA equities including equities with offshore earnings:
 - To match salary related liabilities
 - Reasonable range, 35%–50%, say
 - For life stage models would look to reduce to lower levels closer to retirement dropping to nil in final year
- Overseas equities:
 - Diversification benefits despite SA liabilities as in more global economy
 - To match salary related liabilities, but with a currency risk (although this could be hedged)
 - Reasonable range, 0% up to maximum allowed of 25%
 - Subject to overall limit with local equity of 75%

- SA property:
 - Listed or unlisted
 - Listed closer relation to equity
 - Unlisted likely to provide further diversification
 - To match salary related liabilities
 - Reasonable range, 0% to 15%, say
 - Subject to direct limits

- Fixed interest:
 - Reasonable range, 10% to 20%
 - Depends on the level of inflation linked bonds
 - Adds diversification and stability

- Corporate bonds to sweeten yield subject to small exposure
 - as for RSA bonds, but with a credit risk

- Index-linked bonds
 - Assist in matching benefits that increase according to a price index
 - Added diversification with stable potential inflation matching returns

- Cash
 - % as required based on liquidity requirements
 - To meet immediate liabilities, expenses, benefits
 - As appropriate pre retirement portfolio for cash lump sum and with profit annuity purchases

QUESTION 2

i) Discuss the key features of a living annuity.

- The account balance determines the benefits and liabilities of the individual
- Can elect an income which is deducted from the account balance (typically annually). Income can vary from year to year either due to a voluntary change in the income elected or due to a forced change due to market movements and the minimum and maximum drawdown %
- Investment returns are added to the account balance
- Administration and investment expenses are either explicitly deducted from the account balance or through a reduction in investment returns
- The annual income is often expressed as a percentage of the account balance (income drawdown percentage)
- The legal maximum income drawdown percentage permitted is 17.5%
- The legal minimum income drawdown percentage is 2.5%
- Living annuity providers typically offer a range of investment options which individuals can select from
- The individual account must comply with Regulation 28
- On the death of the individual, the account balance can be used to pay a pension to the spouse and / or children or may be paid as lump sum to the spouse / children depending on the rules governing the living annuity
- If no dependants, the account balance it is paid to the deceased's estate
- The entity providing the living annuity is not exposed to any mortality or investment risk. This is borne entirely by the individual
- Living annuities usually provide that an individual can transfer to another living annuity or to a different type of annuity (with-profit, non-profit etc)
- Generally, providers of living annuities require a minimum initial account balance

ii) Discuss the advantages and disadvantages to providing a living annuity through the fund compared to purchasing a living annuity from an insurer

Advantages Fund

- Seamless transition at retirement, no need to convert assets to cash for transfer to insurer
- No commission payable
- Lower administrations fees as fund has no profit motive
- Probably lower investment fees given the economies of scale the fund is likely to enjoy
- Familiarity. Members know the fund and are likely to have more faith in it than an external provider

Disadvantages Fund

- Less investment choice than what a typical living annuity provider would offer
- Members who still require financial advice would now need to pay for this directly as no commission is payable. Might mean that members don't get advice
- No other products that pensioner can subsequently transfer into (e.g. with-profit annuities). Would then need to source this from an insurer
- Large insurer providing living annuities might be seen as more financially secure than the fund

iii) Discuss the advantages and disadvantages of the proposed investment strategy for living annuity pensioners

- Trustee default strategy means that pensioners, especially older pensioners will not need to make investment choices which they may be unable to do
- But living annuities in fund might be less attractive due to lack of choice
- Perhaps consider limited choice between the 3 fund portfolios but choice will mean the trustees need to communicate more regarding the portfolios and their risk and return objectives

- Balanced portfolio probably has the most appropriate asset mix for pensioners retiring before age 60 as time horizon / life expectancy is about another 25 years
- Retiring members looking for a conservative investment strategy should probably not be in a living annuity in the first place
- But some “younger” pensioners may have good reasons for a conservative investment strategy (e.g. terminally ill, want to transfer to another annuity type in a few years etc)
- Default strategy may want to consider moving into a less risky portfolio as members age, say from age 75 onwards
- But, even then, some 75 year olds may still have a significantly long time horizon to justify staying in the Balanced portfolio
- Whatever strategy, the communication of the investment strategy will be crucial both:
 - Prior to retirement. Members need to be aware that the Balanced portfolio is what will apply after retirement and if they intend taking a living annuity from the fund, they should consider carefully before electing to invest the other 2 portfolios prior to retirement
 - Post retirement. Members need to understand what the default portfolio aims to achieve and if this does not meet their objective they need to change portfolio (if some choice is granted) or purchase their annuity outside of the fund
- Retiring members who are unhappy with the lack of choice or the default portfolio still have the option of selecting a living annuity outside of the fund
- No disinvestment risk as most in Balanced Fund already
- Expected returns in excess of inflation over next 10 years
- Initially, the living annuity assets are only likely to be a small part of the fund's total assets. Investing these in the Balanced portfolio only will help reduce investment fees for the living annuity pensioners. As LA assets grow and achieve their own economies of scale, more investment options or a dedicated LA portfolio(s) could be looked at.

iv) Calculate the requested income drawdown percentage at ages 55, 60, 65, 70, 75, 80, 85, 90 and 95 years. State any additional assumptions that you make

- Balanced portfolio expected return is 4% above inflation (10% less 4%)
- Annuity @ 4% will therefore be expected to provide inflation related increases
- Drawdown % = 1/annuity at the applicable age
- Assume annuity paid on average in middle of year (take annual in adv less 0.5)

Age	Annuity	Drawdown %
55	16.864	5.93%
60	15.132	6.61%
65	13.166	7.60%
70	11.062	9.04%
75	8.956	11.17%
80	7.006	14.27%
85	5.342	18.72%
90	4.027	24.83%
95	3.051	32.78%

v) Comment on the results above and how this can be allowed for in the design of the living annuity benefit

- The drawdown % increase with age.
- The % would reduce if an income to spouse were also taken into account
- The calculation is based on average mortality and especially at older ages this becomes very unpredictable. Caution should therefore be applied in selecting a drawdown % at older ages.
- At younger ages, if anything close to the legal maximum 17.5% is selected, retirees are very unlikely to have an income that increases with inflation.
- At older ages the theoretical drawdown % exceeds the legal maximum. Given the unpredictable nature of mortality at older ages, having a legislative maximum drawdown % does remove some responsibility from the fund

- The trustees can set their own minimum and maximum drawdown % within the legal limits. The trustees should consider an age related maximum drawdown % if they do not want to run the risk of retirees receiving reducing pensions in real, and possibly nominal terms
- Any restrictions on the drawdown % must be clearly communicated at the outset
- Members can elect to purchase their LA elsewhere if the restrictions don't suit them

vi) Discuss the proposal and how this could be modified to take into account any concerns that you have.

- Small funds where they are a member's only retirement savings are often not appropriate for a living annuity.
- Often forced to take the legal maximum drawdown % in order to survive
- Fund will end up with pensioners receiving, small reducing pensions. Bad reputation for fund may result
- But will provide a pension benefit for members who do not qualify to secure an annuity from a insurer due to insufficient capital
- Consider entry requirements:
 - Minimum initial capital, say R1m, in order to qualify for a living annuity.
 - Proof over other non-living annuity income (e.g. R150 000 per annum) from another source.
 - Latter is more administratively intensive, former is simpler
- Problem less serious if trustees impose lower maximum drawdown %s, particularly at younger ages
- Consider profile of members who recently retired or are about to retire. See what different limits would result in

vii) Suggest two other options that the trustees might consider providing to the living annuity pensioners

- Greater investment choice (existing 3 portfolios or add further portfolios)
- Allow living annuitants to transfer out of the fund after retirement to secure another type of annuity or a living annuity from another provider

QUESTION 3

i) **The FD has asked you to comment on the proposed benefit design. Outline the points that you would make in your response, highlighting how well the following benefit design objectives will be met:**

- **improving recruitment and retention**
- **meeting the budget set by the FD**
- **managing risk for the Company**

- Assuming no other cuts in benefit package, should make overall package more attractive.
- Depends whether workforce will appreciate the value of a pension fund.
- Communication will be important to emphasise the value of the fund.
- There is some flexibility in design of pension to be taken.
- But it is simple to understand.
- Age related contribution scale may be regarded as unfair.
- Fund may or may not be competitive for this sector.
- Compulsory member contributions might be too expensive for workforce.
- Could introduce the fund at the same time as pay increases are announced, thus limiting the impact on take-home pay
- Good if want to attract older workforce.

Managing risk for the Company

- Less risk than a DB fund.
- Depends on age profile of employees.
- Now and in the future.
- Risk of selection if over 50s only join then cost will be 12% or closer to 12.0% if over 50 salary roll a high proportion of total salary roll.
- No mortality risk pre-retirement.
- No investment risk pre-retirement.
- Risk that internal conversions will not be cost-neutral.
- Risk that fund will need to fund pensions in payment at a higher level in future than when conversion rates were calculated.
- Risk of fraud (increasing cost).
- Risk of administrative errors (increasing cost) due to members choices, re pension increases, provision for dependants.
- Risk that members (or their dependants) are disappointed with ultimate benefits achieved.

ii) Suggest some alterations to the proposed design that would help to overcome some of the difficulties that you have identified in each of the three areas in i) above.

- Have the Company set conversion rates at retirement.
- Ensure that fund is well-communicated.
- Allow flexible retirement ages.
- Introduce cash commutation option to reduce pension in payment.
- Improve death-in-service benefits, cheap but appreciated.
- Avoid having compulsory member contributions.
- Have a level company contribution rate for all members.
- But allow members to pay additional contributions
- Deduct cost of ongoing expenses from members' funds.
- Buy-out annuities at retirement in members' names.
- Lower buy-out rates to give a cushion
- Limit member choices at retirement

iii) Concentrating on the following aspects, set out the points that you would make in your response

Whether the introduction of these underpins is likely to improve or worsen the chance of the fund meeting the design objectives set out in (i) above

- Option of underpins likely to make fund more attractive.
- But more complex to communicate and administer.
- Other employers unlikely to be offering anything similar these type of underpins are relatively unusual.
- Care needed on pricing of options to avoid Company incurring any extra cost.
- Costs will need to be reviewed on a regular basis.
- Protects Company from risk of members becoming disgruntled about the level of risk in DC funds.
- Care needed re selection against fund need to think carefully about whether members should only have a one-off choice to select an underpin.
- Costs of running fund likely to increase with increased complexity.
- Risk that members will invest their funds more aggressively once they have paid for the underpin.
- Effect of underpins will need to be included on annual benefit statement.
- Investment risk increases – funding of underpins.
- Will lose any chance of valuation exemptions

How you would estimate the cost of each underpin

- Express as % of eligible funds.

Investment return min 2%

- Stochastic modelling of assets to understand probability of returns less than 2% occurring in any particular year.
- Even 0% underpin would be a benefit and would be cheaper
- Impossible to calculate cost exactly.
- Separate modelling needed for each asset class.
- Consider cost of any derivative (or option) that would provide this downside protection.

DB underpin

- Stochastic modelling needed to assess how likely underpin is to bite.
- Deterministic modelling may indicate that underpin is likely to bite for older members

- Cost will vary by age (and possibly sex) of member.
- Impossible to calculate cost exactly.

How you would structure the underpin charge to members

Investment return min 2%

- Charges need to reflect investment choices made.
- Charges need to err on cautious side to reduce Company exposure to risk.
- Pass on additional running costs.

DB underpin

- Charges should be age-related (at least banded by age).
- Charges need to err on cautious side to reduce Company exposure to risk (if not given above)
- Pass on additional running costs (if not given above).

How the funding and investment strategy of the fund might need to change as a result of introducing these underpins

- Actuary will need to advise about reserves required to fund underpin.
- Or Company could meet costs of underpin on a pay as you go basis.
- Company will want some say in investment strategy relating to additional reserves.
- Might wish to restrict range of fund choices offered to members (e.g. remove very volatile asset classes).
- Might purchase appropriate derivatives.