Actuarial Society of South Africa

EXAMINATION

1 November 2013

Subject F204 - Pensions and Other Benefits Specialist Applications

EXAMINERS' REPORT

QUESTION 1

i) Briefly describe the main retirement arrangements available to the company

Part 1 tested the candidate's knowledge of common retirement funding arrangements. Well answered by most candidates.

- Defined benefit where benefits are defined generally relative to service, salary and some accrual factor;
- Defined contribution where benefits are based on the sum of fixed level of contributions together with the investment returns earned on those contributions;
- Provident Fund (DB or DC) where the member is able to take the entire benefit from the Fund on retirement
- Pension (or retirement) Fund where member is required to accept or purchase a pension with at least 2/3rds of the benefit

ii) Set out the points that you would make in your response to the owners' request. Your response should include the use where applicable of examples, calculations and/or projections for each of the elements within the structure

Part 2 tested the candidate's ability to recommend an overall retirement fund design including an estimate of contributions required. Reasonably well answered by most candidates although most failed to determine a contribution rate.

General Structure:

- DC pension/retirement Fund
- Forces purchase of pension with at least 2/3rds
- Plus spouse's pension?
- and therefore meets criteria for some security
- could consider in fund pensions but this creates some risk for sponsor
- could consider offer of default with profits annuity on retirement
- with option on all above to choose own external pension

NRR / benefit targets:

- Net replacement ratio is most common measure for retirement benefit targets
- "generally accepted" that a target of 75% would be reasonable over career
- Assume targeted career of between 35 to 45 years
- Therefore set retirement ages 60 to 65 years

Target projections:
Possible default investment target:

- Assume, achieve a net return of CPI + 4% justified as (anything reasonable):
- If Equity or similar (property etc) earns = CPI +5%, Bonds = CPI + 2%, Cash = CPI

- Assume roughly split 70,25,5 will give CPI +4%.
- Split of 60,30,10 will give +- CPI + 3.5%
- Assume salary grows at CPI

Determine contribution range:
[ideally would like to show some range to justify the recommended rate]

- (1) Assume NRA 60 with service of 35 years:
    - Annuity factor at age 60 = +-15 (anything reasonable)
    - PV annuity certain for 35 years at 4% = +-19.0
    - FV = +-75
    - Contribution rate x FV / annuity factor = NRR as % of salary
    - Contribution rate = NRR x annuity / FV = 75%x15/75 = 15%
    - Implies 7.5% member and employer without risk and costs
    - Possibly on high side if costs 3% to 5% are added

- (2) Assume NRA65 with service 40 years:
    - Annuity factor at age 65 = +-12 (anything reasonable NOT 10 as too low in current environment)
    - FV annuity certain 40yrs at 4% = +-97
    - Contribution rate = 75% x 12 /97 = 9.3%
    - With 3% to 5% for risk and expenses = 14.5%?

- (3) Assume NRA 65 with service 40 years and return CPI +3.5%:
    - Annuity +-12
    - FV annuity certain at 3.5% = +-86
    - Contribution required = +-10.5%
    - 15% total leaves 4.5% for costs?

- (4) Assume NRA65 with service 45 years return of CPI+3.5%:
    - Annuity factor +-12
    - FV annuity certain at 3.5% = +-107
    - Contribution required = +-8.5%

Recommendations on retirement target:

- From above demonstrated that best chance of achieving a reasonable target with reasonable certainty and a reasonable total contribution:

  - Set NRA at 65 years
  - Set total contributions equal to at least 15%
  - Allow +-3% to 5% for cost of fund expenses and risk benefits?

- Allow for preservation in Fund? targets

Risk benefits:

- Per criteria need sufficient support for dependents so allow reasonable allocation towards these benefits
- On disability or ill-health option of lump sum early retirement benefit or temporary incapacity income benefit
- Lump sum for early retirement may not meet needs unless can target a reasonable high lump sum for younger ages
  - Example 35 year old joint income household needs to replace large portion of the income for incapacitated employee
  - May imply a factor of close to 20 times annual salary as little retirement savings in place
  - Close to factor of +-2 times approaching retirement

- PHI income type benefit may be more suitable as provides income for temporary period to retirement date while member continues to save for the post retirement portion
- Typically only 75% of income
- Purchase outside the Fund due to temporary nature
- Death in service could take form of income for dependents or lump sum multiple of salary
- Under DC makes more sense to provide once off lump sum multiple of salary
- Age related lump sum allows better targeting based on needs of average member
- Single multiple across all members simpler to communicate but potentially inefficient use of expense allocation
- Typically single across the Fund multiples range from 2 to 5 times while age multiples can range from 10 at younger ages to 1 or 2 closer to retirement
- Could target an age scale ranging from 6 time salary at younger ages reducing to 1 times salary at older ages and allow an optional increase across the ages paid by members with option once per 5 years to reduce risk of anti-selection (or require a life changing event like marriage or birth of children to increase cover)
- For someone close to retirement the retirement savings over the career would be expected to provide the desired income implies that the spouse alone should be able to provide on the same income level

- Younger members with lower savings need higher multiples to supplement the limited years savings, a multiple of 10 times for a 35 year old member with same aged spouse may provide close to 40% to 50% of the member's income over the spouse's lifetime
- Funeral benefits – low cost and generally well received by members

[any reasonable recommendations with appropriate justification as to its appropriateness and likely target]

Risk and expense allocation:

- Very roughly could expect fund administration for a reasonably sized fund to cost close to 1% of salary
- PHI benefits could range from 1.5% to 2.5% depending on the arrangement
- Death benefit multiples of 8/10 times reducing to 1 / 2 times could cost in the region of 1% to 2%
- Overall an allocation of 5% is likely to enable the Fund to achieve the most appropriate risk benefits

Total contributions

- At a minimum a total contribution of 15% appears desirable
- A contribution of between 8.5% to 10.5% towards retirement savings and 5% towards risk benefits and fund expenses would be expected to reasonably meet the criteria set out by the Company
- If the company operates on a cost to company basis it may be possible to offer members a choice of retirement savings contributions from a total of 15% to 18% where members could potentially choose to enhance either the risk benefits or retirement savings or some combination subject
- Level of choice needs to be appropriately structure with fixed options to reduce complications of Fund administration and member communication

Investment Strategy:

- The initial projections assumed some fixed level of absolute return targets over the lifetime of the membership;
- The Fund could consider offering additional member investment choice;
- With investment choice comes a significant increase in required communication and education and the need for an appropriately structured default for members not wishing to make a choice;
- Life stage options could be considered where the member portfolio is adjusted from more aggressive to more stable lower risk as they near retirement
- Lifestage would typically be made up of building blocks for the varying degrees of risk

- Options could then be given to opt out the lifestage model with a choice of the member's own combination of the various building blocks;
- An alternative would be a default balanced portfolio based on absolute return type target with the option of selecting a higher or lower risk balanced portfolio
- The investment model must take into account the desired default post retirement vehicle and aim to allow members the opportunity to move towards a portfolio that better matches the targeted default post retirement vehicle as they near retirement.
- For example, if the Fund were to encourage a default with profits type annuity a cash or near cash portfolio would be an appropriate pre retirement option

QUESTION 2

i) Set out what additional information and the data you require in order to determine the severance benefit liability.

Part 1 was a straightforward question testing the candidate's ability to identify what information was required to carry out a severance pay valuation. Answers from most candidates were surprisingly poor. This might be due to the unfamiliar structure of the benefit.

<u>Additional information</u>

- Date as at which results are required (valuation date – typically financial year end of Zamgolia Resources)
- How is pay defined for severance benefit purposes? Basic pay excluding allowances or total package? Can employee affect the severance pay amount (e.g. dropping allowances etc)
- Does the benefit accrue from 1 March 2010 or does it include past service for each employee from date joined company
- Does the company pay the minimum benefit or does it pay a higher benefit e.g. larger benefit or allow for benefit in more circumstances (e.g. retirement before age 65), does company include management or only employees
- Will a benefit be payable once employees of the second division retire at age 60?
- Has any previous severance pay valuations been undertaken by Zamgolia Resources. Obtain a copy thereof
- Details of the calculation in respect of any severance benefits paid in the year up to the valuation date. Total severance benefit paid, split by employee in the year up to the valuation date.

<u>Data required</u>

In respect of each employee the following data is required as at the valuation date:

- Name or identifier
- Gender
- Date of birth
- Severance pay
- Total pay (if different)
- Date of employment
- Normal retirement date (or division within Zamgolia Resources)
- Indicator of management or employee?

- In the event that no previous IAS19 valuation was carried in the prior year, the auditors may require a comparative valuation one year earlier. In this case the above data will also be required one year earlier.
- Details of any plan assets if any and do/would they qualify as plan assets?

ii) Outline the valuation assumptions that are required for the valuation and how you would determine these assumptions.

Part 2 asked candidates what valuation assumptions they would require to carry out an IAS19 valuation of the severance pay benefit and how they would set these assumptions. Most candidates made a reasonable attempt at this and got most of the more obvious marks. The better candidates picked up on the complications arising from the unique situation of Zamgolia and the unique benefit structure.

- IAS19 requires market related best estimate assumptions. This applies to the assumptions when viewed on their own and when looked at collectively as a group

- Ultimately, the assumptions are the responsibility of the Company (Zamgolia Resources)

- <u>Rate of discount</u>

- Must be based on high quality corporate bond yields as at the valuation date or, if these are not available, government bond yields (no adjustment)

- Bond yields can be in the form of a yield curve applied to the liability cashflow of a corresponding duration or the yield at the average duration of the liabilities can be used

- Zamgolia may not have suitable corporate or government bonds at the required duration(s). Can use yields from a neighbouring country with appropriate adjustment for risk. Alternatively use yields in a “similar” country (other suitable explanations will be credited)

- <u>Rate of inflation</u>

- Usually determined as the difference between nominal and inflation linked bond yields, possibly with an inflation premium adjustment.

- Also consider other sources (e.g. company expectations, reserve bank targets), likely to be needed here as little or no bonds (especially inflation linked)

- <u>Salary increases</u>

- Discuss with company. Likely to have a salary increase policy relative to inflation for medium to longer term.
- Range of 1% to 2% above inflation is common
- Also consider promotional scale. Discuss with Company. Most likely age related.
- <u>Mortality and disability</u>
- Ideally, would use experience of Zamgolia Resources to set mortality and disability rates. Consider any information available. 3 400 employees might give limited statistical credibility.
- Also consider any mortality and disability studies for Zamgolia and possibly adjust these for company experience / expected experience and the fact that civil war has ceased and past experience may not be meaningful
- If none of the above sources exist, consider mortality tables for other similar countries and make appropriate adjustment.
- Higher mortality / disability means a higher liability.
- <u>Resignation and unfair dismissal</u>
- Discuss staff withdrawal with Company and see what statistics are available.
- Most likely an aged based table with lower resignation at older ages.
- Unfair dismissal stats might be very unreliable. Probably use practical approach in discussion with company (e.g. 1 in 20 resignations is an unfair dismissal)
- <u>Retrenchment</u>
- Discuss with company. Unless there are known retrenchment plans then this contingency would most likely be ignored in the valuation
- <u>Retirement</u>
- Is early retirement or late retirement part of company policy?
- Allowance for early retirement will reduce liability if only minimum benefits are paid (but could increase liability if a benefit is paid on early retirement)
- Late retirement can increase liability for the second division if it is allowed as late as age 65 years

- Promotion to management
- No benefit paid to management. Could consider allowing for this in valuation but will be difficult to predict and probably ignore this.
- Consider current management. If they move to a non-management position (e.g. part time work etc) will they might then qualify for a benefit. Discuss with company.

iii) Discuss the merits of the investment manager's recommendation

Part 3 asked candidates to comment on the merits of funding the IAS19 liability through a separate investment vehicle. Poorly answered by most candidates.

- There is no requirement under IAS19 to fund a liability, it only needs to be recognised.
- Is there any requirement under the Labour Act to fund the severance benefit (would be unusual)
- Funding the benefit:
  - o Will provide extra security that employees will receive the severance benefit
  - o Might create additional expectations that employees will receive a benefit under other circumstances if there are separate assets. Increased costs may ultimately be the result
  - o Will have immediate cashflow requirements for the company in the short terms as it needs to fund the accrued liability.
  - o Will have reduced cashflow requirement for the company in future as assets are used to pay benefits
  - o Does not guarantee that the benefit cost will be met from the assets. It particular if investment returns don't exceed salary increases by a margin, the assets may be insufficient. Further demographic experience may differ from that assumed which could lead to excess / shortfall in assets.
  - o Might provide a more realistic measure of the cost of the benefit in that the company makes a regular cash contribution to the investment portfolio (as opposed to only showing a service cost in its AFS)
  - o Conceptually, any company should be hesitant to fund such benefits if not compelled to do so. Keeping the liability on its balance sheet is effectively an investment in the company. An expected higher return on the investment

portfolio would theoretically mean the company feels is can do better not investing in the company!

- Investment portfolio:
  - o To be appropriate for the liabilities, the investment portfolio would need to provide returns exceeding salary increases. This would require investments in equities and property.
  - o The portfolio should also be reasonably well diversified.
  - o Do sufficient investment opportunities exist in Zamgolia?
  - o Is offshore investment permitted? This would provide the investment opportunities.
  - o Investment manager's track record (new country – could be short)
  - o Cost of investment will reduce returns – also look at tax implications if returns are taxed in any way.
  - o Additional company management time needed to monitor investment

iv) Discuss how Zamgolia Resource could achieve this

Part 4 required candidates to discuss how the overall cost of the severance pay benefit and the company's pension scheme could be minimised. Poorly answered by all candidates.

- Make sure company is paying only minimum benefit in terms of Labour Law.
- Check that pay definition used for severance benefit is determined as the minimum possible.
- Does Act allow an employer with a pension fund to be exempted from paying benefits under the Labour Law?
- If yes, can this be done in a simple manner (e.g. minimum contribution level) or would the pension fund have to provide guarantees of a defined benefit nature?
- In case of the latter, the additional risk to the employer may well not make it worth it to alter the pension fund benefits.
- If exemption is not possible, consider reducing benefits in pension fund to offset Labour Law benefits.
- Will probably only be possible for future service (reduced contributions toward fund).

- For accrued saving in pension fund, it will be difficult to reduce these for any benefits already accrued under the Labour Law.
- Don't allow any later retirement after age 64 in the second division.
- Could look at reducing NRA from 65 to 60 years in first division. Would be difficult for older employees and would probably require some form of compensation to do this (surplus in pension fund?)
- All new employees in first division hired with NRA below age 65 years (60 years most likely)

QUESTION 3

i) How benefits are provided in a retirement annuity and a defined contribution pension fund and how the retirement annuity can be used in the case of Joe Soap.

Part 1 tested the candidate's understanding of DC retirement funds and RAs. Candidates were asked to apply this knowledge to a member. Better candidates did okay but as a whole it was poorly answered.

- RA is an individual contract, pension fund is a group contract with varying degrees of risk pooling
- Both are subject to Pension Funds Act (incl Regulation 28)
- PF membership is conditional on employment with the participating employer (possible exception if deferred membership is allowed in PF rules on exit).
- RA tends to give greater flexibility regarding contribution amount and frequency. PF has 1 rate with possible AVC's
- Tax treatment is similar for RAs and PF although tax free contributions limits on member contributions (15% for RA, 7.5% of salary of PF plus ER conts under PF up to 20% are tax free).
- Both compel annuity at retirement but up to 1/3rd can be commuted for a lump sum.
- RA will not impose conditions as to type of annuity purchased at retirement
- RA does not allow a cash benefit (unless permanently immigrating). Benefit only payable on death and retirement (including disability retirement). Early retirement permitted from age 55 years.
- Can transfer from a pension fund to a retirement annuity on exit.
- Preservation is important if NRR is to be maintained
- But may need pension fund benefit for new business?

ii) Investment and expense considerations

Part 2 asked candidates to set out the differences in expenses and investments between the fund and an RA. Poorly answered by the majority of candidates.

- Pension fund has a life stage investment model with no further investment options. Under the RA there is likely to be significant investment choice.

- Trustees in PF look after investment decisions, probably with expert advice given size of fund.

- In RA, member must make the investment decisions (perhaps using his broker).

- In RA, member can target investments towards a retirement pension other than an inflation linked annuity (e.g. conventional bond portfolio for non-profit annuity, cash for with profit etc)

- In PF, given size of fund and lack of choice, investment fees likely to be no more than 50 basis points. In RA, pure investment fees likely to be closer to 100 basis points (depending on portfolios elected)

- Other than the investment fee in PF, no further expenses as ER covers these.

- Under RA the further additional charges are likely:

  - An asset levy which will typically cover the administration fee (0.50% to 1.0% is common)

  - Commission or advisor fees. May be a percentage of assets or contributions.

  - Contribution towards non-administrative fund expenses (e.g. audit, FSB levies etc).

- Typically, could expect total expense impact in RA to be between 1.5% and 3.0% of assets per annum. This is in addition to the extra 0.5% for investment fees (give marks for any reasonable comment on expenses and investment fees)

iii) Risk benefit provision

Part 3 asked candidates to set out the differences in risk benefit provision between the fund and an RA. Poorly answered by the majority of candidates.

- Death benefits in excess of the accumulated fund will cease when members exits PF.

- RA through an investment manager is unlikely to offer insured death benefits in excess of the accumulated fund.

- Will need to look at taking out individual insurance (or increasing the benefit under any policies that Joe may already have)

- If PF benefit is insured, there may be a continuation option whereby the exiting member can take u the same level of cover without underwriting.

- However, rates are likely to be expensive if member in good health

- If member in poor-health and no continuation option, might not be able to get cover enjoyed in PF at all (no free cover limit in individual insurance)

- If Joe is single, loss of PF benefits is less acute as got no benefit from the spouse's pension in the PF

- As employer covered the cost of risk benefits, any insurance premiums would be an added benefit cost for Joe

- Most likely the spouse's pension on death in the PF would be replaced by a larger insured lump sum benefit.

- If a spouse's income is available as an insured death benefit it will be based on a Rand amount (not % of salary), possibly with some form of annual escalation.

- Would need to consider disability benefit as well. Generally a lump sum for individuals or a fixed escalation income (not salary related)

- Same comments regarding underwriting and conversion options apply to disability benefits

iv) Taking into account the issues raised in i) to iii), determine a suitable rate of contribution towards the retirement annuity in order for Joe to meet his retirement objective.

Part 4 asked candidates to determine a suitable contribution rate under the RA in order for the member to maintain the same level of retirement benefits. Candidates either did very well or very poorly on this question.

<u>Determine PF annuitisation basis</u>

- Term to retirement is 15 years

- Monthly contribution towards retirement is 10% x R300 000 / 12 =R2 500

- Real return = 3.0% (or 0.246627% per month)

- Value of future conts factor is ((1.00246627)^180-1)/0.00246627 = 226.239

- Value of future conts is R2 500 * 226.239 = R565 599

- Value of current Fund Credit is R1 800 000 * 1.00246627^180 = R2 804 341
- Total capital for retirement is R2 804 341+R565 599 = R3 369 340
- Implied annuity rate at age 60 is R3 369 340 / (75% * R300 000) = 14.98 (mark if not given above as part of required capital)

<u>RA contribution required</u>

- Impact on returns of moving to RA is 1.5% per annum (or any reasonable figure)
- Return for calculating benefit = 3.0% less 1.5% = 1.5% per annum or 0.124419%
- Value of future conts factor is ((1.00124419)^180-1)/0.00124419 = 201.558
- Capital required for retirement is R3 369 340 (from above)
- Value of current Fund Credit is R1 800 000 * 1.00124419^180 = R2 250 418
- Required total future conts R3 369 340 – R2 250 418 = R1 119 522
- Required contribution rate is R1 119 522 / 201.558 = R5 554 pm
- Equal to 22.2% of contributory salary

v) Recalculate the required rate of contribution towards the retirement annuity. Comment on your results and set out what advice you would provide to Joe

Part 5 (6 marks) asked candidate to redo the calculation assuming no transfer into the RA and provide advice based on the result. Overall this was poorly answered.

<u>Revised RA contribution required</u>

- Required total future conts R3 369 340
- Required contribution rate is R3 369 340 / 201.558 = R16 719 pm
- Equal to 66.9% of contributory salary

<u>Comment</u>

- Required rate under RA with preservation is already double PF rate. Without preservation it is tripled again
- Both RA rates above maximum tax deductible amount of 15% of salary

- Given that Joe is starting a new business:
  - Unlikely to be able to afford either level of contribution
  - Preservation is key; but
  - Cannot ignore current financial position if money needed for business

<u>Advice</u>

- Try finance business from other sources. Not preserving accumulated fund in PF is extremely detrimental
- Shop around for RA's with lowest cost that can provide the required balanced fund investments. Cost are critical
- Consider extending NRA beyond 60 years
- RAs do allow flexibility with contributions. Can also add lump sums at later date but delay in funding is costly
- Check that RA funding for retirement is on track regularly, especially as contributions likely to be erratic
- Don't neglect risk cover, especially disability cover. Shop around