

**Actuarial Society of South Africa**

**EXAMINATION**

**28 October 2015**

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

**MARKING SCHEDULE**

## QUESTION 1

- i) **Briefly describe the key elements likely to be needed in the overall pension's regulatory framework.**

*{The question was well answered by most candidates}*

- General legislation relating to the financial services industry
- Pension legislation – set of laws to govern the pensions industry
- Tax legislation – laws allowing for interaction between savings and taxation
- Regulator / monitoring entity – implement and monitor the application of legislation, including;
- Prudential regulation – concerned with the financial soundness of the entities
- Conduct regulation – overseeing conduct of those in the industry, service providers, professionals, trustees etc
- Professional oversight – auditors, actuaries, principal offices, independent/professional trustees, professional bodies and standards
- Individual member protection – complaints and adjudication process
- Other reasonable suggestions

- ii) **Set out the items that would need to be dealt with under the pension legislation.**

*{The question was well answered by most candidates}*

- ***Application of the legislation***
  - Background and purpose
  - Definitions
  - Regulators
    - Registrar and Deputy
    - Powers of regulator / registrar

- ***Governance***

- Registration and incorporation
  - Exemptions
- Boards of trustees
  - Appointment
  - Fit and proper requirements
  - Representation
  - Objectives
  - Duties
- Principal Officer / Responsible Person
  - Appointment
  - Fit and proper requirements
  - Duties
- Administrators
  - Licensing
  - Fit and proper requirements
- Auditors and Actuaries
  - Appointment
  - Approval
  - Duties and responsibilities
  - Professional Conduct standards
- Rules
  - Purpose
  - Amendments
  - Binding force / powers

- Conduct and business of Funds
- Mergers and transfers between arrangements
- Financial condition
  - Accounting requirements
  - Financial soundness reporting requirements
  - Access to information
  - Financial remedy
- ***Benefit structure***
  - Purpose and business of entities
  - Minimum benefits
  - Benefit expectations
  - Use of excess/surplus assets
  - Amendments to benefits
  - Benefit disposition
  - Deduction from benefits
  - Options / restrictions on exit
- ***Protection of individual members***
  - Complaints process
  - Adjudication of complaints
  - Enforceability and power of adjudicator
- ***Investment framework and structure***
  - Restrictions on certain investments / asset classes
  - Investment strategy, Investment Policy Framework
  - Monitoring and reporting
- ***Termination or suspension of registration***

- ***Taxation***
  - Links to tax authorities
  - Tax incentives in relation to savings
  - Taxation of benefits
  - Taxation of income earned by the arrangements
- ***Transitional arrangements***
  - Conversion of current arrangements
  - Timeframes
  - Exemption or partial exemptions
- ***Regulations or associated legislation***
  - Enabling refinement
  - Detailed implementation of certain sections of legislation
  - Interaction with other legislation

**iii) Discuss the risks and uncertainties, advantages and disadvantages to the sponsor and to the participating members of each of these types of arrangements in the context of this single pension scheme.**

*{The question was well answered by most candidates. Some additional points not reflected in the marking schedule were also credited.}*

**Defined Benefit**

- For the beneficiary there is a risk that the promised benefits will not be paid due to underfunding, insolvency of a sponsoring employer or government.
- The main way in which this risk is managed is the requirement that every defined benefit fund appoint a valuator, who will investigate the financial position of the fund at regular intervals
- Risks relating to the actuarial basis used and method adopted including legislative changes to valuator's choice of basis and method
- Certainty with regards to accrued benefits

- In relation to future accrual, a benefit expectation may be reduced due to a change to the benefit structure. Depending on the rules, such change may be made by the employer or trustees.
- To the extent that defined benefits are not linked to appropriate escalation bases, for example after leaving employment or after retirement, the beneficiary is exposed to the risk that their standard of living declines relative to the rest of the population.
- Any benefits that are not linked to price inflation create a risk that the purchasing power of the benefits reduces with time.
- The sponsor of defined benefits is exposed to the risk that the actual cost of providing the benefits is greater than anticipated.
- Who is the sponsor
- Who will fund deficits, Government or shared with employees;
- There is also a risk that additional funding is required when not anticipated or when there are other calls on those funds.
- Risks and uncertainties may relate to some or all of the following factors:
  - the benefit structure in terms of the rules,
  - the profile of the membership by age and gender,
  - the number of employees who join the fund, and their ages,
  - the number of members retiring in good health and in ill-health and their ages,
  - the numbers and ages of members withdrawing from the fund,
  - the numbers and ages of members dying either before or after retirement,
  - the existence and age of a spouse or other dependant on the death of a member,
  - the numbers and ages of qualifying spouses and dependants who die,
  - the rate of individuals' salary growth, whether inflationary or promotional,
  - the rate of price inflation,
  - the levels of investment return achieved.

- There may also be less quantifiable risks resulting from member's expectations that aren't automatically met.
- Provided the funds are sufficient, the trustees will be able to allow the sponsor some flexibility in the payment of the required contributions and any unanticipated costs.
- However, if the funds barely cover the liabilities, particularly those relating to discontinuance cost, there may be less scope for flexibility.
- At the other end of the funding scale, there is also a risk that the funds move into surplus.
- The surplus may have to be shared with the members, and may not be used exclusively for the reduction of the sponsors' contributions.
- Further uncertainties will also arise in relation to any options that are available to members.
- For example, a member may be able to choose, to an extent, the proportion of the pension benefit commuted for a lump sum at retirement. This uncertainty may relate solely to the timing of these benefits.
- However, most benefit options provide the members with an opportunity to select against the fund by choosing the option that is of greatest value to them either economically or demographically. The extent to which such selection will affect the cost of the fund will depend on the financial sophistication of the members and also on other, not necessarily financial, factors that affect a member's preference for certain benefits.
- Transitions to this arrangement if all other mostly DC

### **Defined contribution**

- The benefits arising from a defined contribution arrangement are dependent on the following:
  - the level of net contributions made towards the funding of retirement benefits in the defined contribution fund (that is, after subtracting the costs of insuring risk benefits and expenses),
  - the investment returns that are achieved,
  - salary progression over the members' contributing lifetime,
  - retirement age,

- the terms on which annuities can be bought on retirement,
  - the market values of the investments when that annuity is purchased,
  - the impact of non-preservation upon changing employment.
- The beneficiary is therefore exposed to much uncertainty and the risk of having lower benefits than anticipated - specifically if returns don't meet inflation, resulting in a loss of purchasing power.
  - In common with defined benefit provision, the beneficiary is also exposed to the risks associated with insolvency of a sponsor, or an investment provider (such as an insurance company), and fraud.
  - The uncertainties for the sponsor are much fewer than with defined benefit provision.
  - Uncertainties relate to the number of members for whom contributions are paid and the relationship between those contributions and the turnover of the company.
  - In the longer term, the emerging benefits may turn out to be much less than originally expected, with pressure on the sponsor for an increase in the contribution rate, together with the problem of finding a cost effective solution.
  - Difficult for lay person to understand and predict and therefore plan for future
  - Investment choice and options
    - Dealing with wide range of employees who would participate
    - Potential lack of financial knowledge or significant disparity between those who can and can't understand
    - Wider choice creates greater issues of understanding
    - Too small a choice does not allow for management of their own risks
    - Cost and administrative burden of managing choice
  - Transitions to this arrangement if all other mostly DB

iv) **Stating the realistic assumptions you use, estimate the expected contribution rate required for typical new entrant to the proposed scheme. You should use 5 year age intervals starting at a 20 year old employee.**

*{Well answered by most candidates but some poor answers as well.}*

• **Assumptions**

- Assumption for inflation (6%)
- Salary inflation (7%)
- Expected return on assets (11% = inflation + 5% simple middle of road DC target)
- Would expect to use a net assumption but this should then be based on reasonable individual assumptions and appropriately related (net 4% above salary needed in calculations)
- Assume a reasonable annuity (no longer appropriate to assume 10 or 12) at age 65 years = 15
- Assume annual contributions in arrears, any will be sufficient
- Assume no decrements pre-retirement
- Assume no prior savings

Age	NRA	Term	Pension: 1.5% x term subject to 60% max as % of salary	Capital Value: as multiple of salary	PV Capital: as multiple of salary	PV annuity certain	Annual Contribution as % of salary
20	65	45	60.0%	9	1.540786	20.72004	7.4%
25	65	40	60.0%	9	1.874601	19.79277	9.5%
30	65	35	52.5%	7.875	1.995647	18.66461	10.7%
35	65	30	45.0%	6.75	2.081151	17.29203	12.0%
40	65	25	37.5%	5.625	2.110032	15.62208	13.5%
45	65	20	30.0%	4.5	2.053741	13.59033	15.1%
50	65	15	22.5%	3.375	1.874018	11.11839	16.9%
55	65	10	15.0%	2.25	1.520019	8.110896	18.7%
60	65	5	7.5%	1.125	0.924668	4.451822	20.8%

v) **Comment briefly on the contribution rates derived in part iv).**

*{Surprisingly poorly answered in most cases, even those candidate who did well in part iv).}*

- Costs would depend on the age at which employees enter the workforce, escalating the later the entry age;
- The escalation relates to the time over which savings can grow and accumulate investment returns towards meeting the defined targets
- Existing savings would reduce the overall cost of reaching the target
- The actual costs will depend on the actual experience of the arrangement
  - Investment returns
  - Salary escalation levels
  - Pre-retirement mortality
  - Post retirement mortality
- Bonus for other reasonable comments

vi) **Repeat the calculations in part iv) above allowing for a minimum pension of N2000 per person per month. Illustrate the impact for an employee earning the national average monthly salary of N8000.**

*{Poorly answered}*

- Continue from above workings same assumptions as before
- Due to the N2000 need to apply a salary, N8000 p.m. equal N96000 p.a
- Expected that only those above age 48 assuming no prior savings would require the minimum top up

Age	Pension: 1.5% x term subject to 60% max as % of salary	Subject to Min	Capital Value:	PV Capital:	PV annuity certain	Annual Contribution as % of salary
20	57600	57600	864000	147915	20.72004	7.4%
25	57600	57600	864000	179962	19.79277	9.5%
30	50400	50400	756000	191582	18.66461	10.7%
35	43200	43200	648000	199790	17.29203	12.0%
40	36000	36000	540000	202563	15.62208	13.5%
45	28800	28800	432000	197159	13.59033	15.1%
50	21600	24000	360000	199895	11.11839	18.7%
55	14400	24000	360000	243203	8.110896	31.2%
60	7200	24000	360000	295894	4.451822	69.2%

**vii) Briefly set out some of the key issues that would need to be considered with regards to transfers from other DB or DC retirement arrangements**

*{Better candidates answered this well but largely poorly answered.}*

- Legislated or not
- Full benefits to be transferred or rather some minimum opening balance
- If not full what would happen to the rest,
- Potentially these would be closed funds with no or only top up contributions;
- Issues of costs for these left over fund
- Valuation bases to be used to determine the accrued benefits in DB funds
- Protection of DB rights under the new arrangement
- Member investment choice was provided previously and would be desired
- Benefits on retirement compared to current
- Will transfer values count in addition to any minimum benefits or not. If no then no incentive to transfer in for older / lower paid.
- Opting out provisions or exemptions
- Impact on current arrangements

**viii) Discuss the broader issues that would need to be considered in the context of allowing additional top up savings both inside and outside the scheme.**

*{Better candidates answered this well but largely poorly answered.}*

- Will saving be encouraged;
  - Incentives
  - Tax; or
  - Matching extra contributions
- Within or outside the scheme
- If within on a different basis or not, DC or DB purchase
- If DC will there be different or additional investment options
- If allowed outside it would imply need to regulate other arrangements
- Would then be set top up schemes, would they use old or existing, insurer or private
- Protection of benefits
- Cost of benefit structures, if single was to reduce costs would this assist
- If the single scheme is not appropriately designed to meet targets then risk of non-participation in top up scheme still means the retirement benefits may not be sufficient

- ix) Using all information already provided estimate the potential additional contributions or, alternatively, the lump sum required on entry to ensure that all employees achieve a 75% replacement ratio.

{*Poorly answered.*}

Age	Pension: 75% of salary	PV Capital:	PV annuity certain	Annual Contribution as % of salary	Additional Contributi on	Lump sum contribution or transfer in
20	72000	184894	20.72004	9.3%	1.9%	36979
25	72000	224952	19.79277	11.8%	2.4%	44990
30	72000	273689	18.66461	15.3%	4.6%	82107
35	72000	332984	17.29203	20.1%	8.0%	133194
40	72000	405126	15.62208	27.0%	13.5%	202563
45	72000	492898	13.59033	37.8%	22.7%	295739
50	72000	599686	11.11839	56.2%	37.5%	399790
55	72000	729609	8.110896	93.7%	62.5%	486406
60	72000	887681	4.451822	207.7%	138.5%	591788

## QUESTION 2

- i) **The HR director has asked you to comment on the proposed benefit design and the risks associated with it from the point of view of the company and the employees.**

*{Well answered by most candidates but some surprisingly poor answers as well.}*

### **Employees**

- Assuming no other cuts in benefit package, should make overall package more attractive.
- Depends whether workforce will appreciate the value of a pension fund.
- Skilled workforce probably will but a provident offering lump sum benefits on retirement might be better suited (pending legislation might remove this option)
- Communication will be important to emphasise the value of the fund.
- Employees face investment risk and reward
- There is some flexibility in design of pension to be taken.
- And members can elect a contribution rate to suit their tax status
- But it is simple to understand.
- Age related contribution scale may be regarded as unfair unless company works on TCOE basis.
- Fund may or may not be competitive for this sector.
- No risk benefits

### **Company**

- Less risk than a DB fund.
- Company cost depends on age profile of employees.
- Now and in the future.
- Risk of selection if over 45s only join then cost will be closer to 8.5% if over 45 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 administrative errors (increasing cost).
- Risk that members (or their dependants) are disappointed with ultimate benefits achieved.
- Could introduce the fund at the same time as pay increases are announced, thus limiting the impact on take-home pay if TCOE applies
- Good if want to attract older workforce.

**ii) Suggest alterations to the proposed design that would help to overcome some of the company risks that you have identified part i).**

*{Well answered by most candidates but some surprisingly poor answers as well.}*

- Have the Trustees set conversion rates at retirement.
- Or require the purchase of an annuity from an insurer
- Ensure that fund is well-communicated.
- 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.
- Buy-out annuities at retirement in members' names.
- Lower buy-out rates to give a cushion

**iii) Comment on whether the introduction of these guarantee options is likely to improve or worsen the chance of the fund meeting the design objectives set out in part (i).**

*{Poorly answered by most candidates.}*

- Guarantee options likely to make fund more attractive.
- But more complex to communicate and administer.
- Other employers unlikely to be offering similar guarantees
- 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 a guarantee option.
- 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 guarantee.
- Effect of guarantee will need to be included on annual benefit statement.
- Additional DB guarantee may increase compliance costs, actuarial valuations and IAS 19 provisions for employer

**iv) Comment on the nature of each guarantee and what you would consider in estimating the cost of each guarantee.**

*{Poorly answered.}*

***Cumulative Investment return min 4% per annum***

- Stochastic modelling of assets to understand probability of cumulative return going below 4.0% per annum.
- Impossible to calculate cost exactly.
- Cost will also vary by past investment returns earned by the member and period of membership

- It will further vary with investment portfolio used in future
- Members with short service are more likely to “bite” the guarantee unless investment performance is consistently poor.
- Short service retirees are unlikely (unless older employees are hired), so most likely will apply on deaths
- Need to take care where an older new employee transfers in monies (either a special charge or exclude TV from guarantee)
- Separate modelling needed for each asset class.
- Consider cost of any derivative (or option) that would provide this downside protection.
- Would need to be an asset based fee (% of DC funds).

***DB guarantee***

- Stochastic modelling needed to assess how likely guarantee is to bite.
- Deterministic modelling may indicate that the guarantee is likely to bite for older members with short service
- As guarantee does not revalue earlier salaries from earlier period
- Cost will vary by age (and possibly sex) of member.
- Impossible to calculate cost exactly.
- Would probably be an asset based fee but salary based fee is also possible
- Will most likely increase with age but also decrease with service assuming salary increases were granted each year

**v) Comment on how the investment strategy of the fund might need to change as a result of introducing the guarantees.**

*{Poorly answered.}*

- Actuary will need to advise about reserves required to fund the guarantee
- Or Company could meet costs of the guarantee on a pay as you go basis.
- Company will want some say in investment strategy for additional reserves.

- Might wish to restrict or remove range of fund choices offered to members (e.g. remove very volatile asset classes).
- Might purchase appropriate derivatives.
- With longer term good investment performance, both guarantees will cost less for longer serving members. An overly cautious investment strategy might therefore not be optimal