

EXAMINATIONS

September 2001

Subject 304 — Pensions and Other Benefits

EXAMINERS' REPORT

Introduction

The attached subject report has been written by the Principal Examiner with the aim of helping candidates. The examiners are mindful that a number of interpretations may be drawn from the syllabus and Core Reading. The questions and comments are based around Core Reading as the interpretation of the syllabus to which the examiners are working. They have however given credit for any alternative approach or interpretation which they consider to be reasonable.

The report does not attempt to offer a specimen solution for each question - that is, a solution that a well prepared candidate might have produced in the time allowed. For most questions substantially more detail is given than would normally be necessary to obtain a clear pass. There can also be valid alternatives which would gain equal marks.

K Forman
Chairman of the Board of Examiners
20 November 2001

Examiners' Comments

Q1 . This question was reasonably well answered. Most of the students picked the key points including the difference in risks and costs between active and passive funds.

Q2. This question was reasonably well answered although a number of students did not mention member expectations under both parts and the reasons why these may not be met. Generally the key points were mentioned

Q3. This was generally poorly answered. A large number of students failed to discuss the "financial considerations associated with negotiating a financial settlement on divorce". There was too much emphasis on describing the three methods mentioned in the question and much less on the financial issues. The second part of this question was also not well answered. Very few students mentioned that the cost implications of providing death benefits for non married partners was not likely to be large.

Q4 This was generally not very well answered. Students failed to distinguish between advanced funding and terminal funding. Some focused on book reserving which is not a form of financing-it is an accounting issue.

Q5. This question was not well answered. Very few students mentioned that low investment returns will in the long term result in higher costs. A large number seemed to dwell on actuarial assumptions and the gap between investment returns and salary increases/pension increases.

Although the second part was slightly better answered, few candidates mentioned that lower investment returns may lead DC plan members to invest more aggressively.

Q6. This question was reasonably well answered, students were well aware of the issues and also got good marks for drafting the report.

Q7. Part (i) of the question was reasonably well answered. A large majority of the students were aware of the control cycle and issues relating to it.

Part (ii) was less well answered. Very few mentioned employer's attitude to risk and continued appropriateness of matching policy.

Part (iii) was well answered. A large number of students mentioned the key points - in particular defining the precise objectives of the exercise. A few got entangled in data details for a valuation and hence did not get the marks.

Part (iv) Again a part answered not very well. Quite a large number of students got confused with details of an ALM study rather than the main issues.

- 1 (i) Any stated investment objectives
in particular the trade off between risk & rate of return
for example — the amount in any one single company, the maximum
amount in non-marketable assets, overseas exposure, self investment etc.
- Any stated performance objectives
Actual investment performance in detail (eg by asset class, returns over
given time periods)
The investment managers' (or investment vehicles) performance against
that of other funds
The current liability profile by nature & term
For example, pensions in payment (fixed or escalating), age profile of
membership
Is the scheme open closed to new entrants?
The funding position (surplus or deficit?)
Any impact of any statutory funding or investment requirements
The size of the fund
Is the fund increasing, static or decreasing?
Expected future cashflows
- Use of asset liability models
Sponsoring employer's attitude to risk
Use of insurance of benefits to reduce volatility
Use of financial instruments — such as derivatives, hedging
- (ii) Active investment management — there are few restrictions on the choice
of investments with perhaps just a broad benchmark of asset classes
Active Investment managers can make judgements as to the performance
of individual investments, both in the long and short term
Active management should result in greater expected returns as a result
of the freedom to apply judgement
The active manger will set out to outperform the passive investment
but extra costs are involved with more regular transactions
There is a greater risk that the managers judgement is wrong and returns
are actually lower
Active investment returns are often volatile compared to a given index
while the passive investment by definition is generally consistent with the
chosen index
Passive investment management is holding assets that closely reflect
those underlying a certain index or specific benchmark
with little or no freedom for the investment manager to choose the
investments
The use of passive investment has grown over the recent years
often resulting from periods of insignificant net gains from some active
approaches
With passive investment one of the main aims is to minimise costs
Passive investment is often computer driven (reducing costs)
It is possible for pension funds to have part of the fund invested passively
with the balance actively managed

Passive management is rigid and inflexible.

Passive managers are expected to marginally underperform chosen index over time

2 (i) Member's Expectations on Discontinuance

- The basic expectation is to the benefits that would have been paid if the pension scheme had not discontinued:
- This includes benefits already in payment
- and any accrued benefits for members not yet retired who have left service;
- For members still accruing benefits, it probably means only the benefits they would have received if they had left service
- but there may also be an expectation of future service accrual.
- There will be an expectation that benefits will continue to increase in line with previous practice (even if discretionary).
- This covers post retirement increases, and pre-retirement.
- For actives, possibly an expectation of benefits linked to salary growth up to retirement.
- There may be an expectation that other discretionary practices will continue, for example, generous early retirement benefits.
- There will be an expectation of contingent benefits to dependants.
- Expectations will be affected by past communications from the employer
- and by any communication in connection with the CDF.
- They may also be affected by the funding level of the existing scheme: for example that surplus will be used to augment benefits.
- May vary depending on whether the employer continues or is, itself, ceasing
- and whether employer itself is offering any replacement provision

(ii) Likelihood of CDF meeting expectations

- The CDF will need to define the benefits that it will take on.
- A CDF may offer a means of providing discretionary benefits that would not be available or may be prohibitively expensive through other discontinuance routes (e.g. insurance buy-out policies).
- The CDF will need to set a premium to cover the cost of taking on a scheme's benefits (however defined).
- If a scheme is discontinued, then this premium will need to be paid
- either out of the scheme's assets or by the sponsoring employer.

- If the scheme has more than enough assets to meet the CDF premium, then the surplus may be used to improve members' benefits. This may exceed their expectation.
- If the scheme has insufficient assets and if the employer cannot meet the shortfall, then the premium cannot be met and benefits will have to be reduced.
- The reduction may be proportionate for all members or there may be a priority order (for example, meeting pensioners' benefits first) so that some benefits are unaffected but others are more significantly reduced. Either way, expectations will not be met.
- To avoid this, there may be a system for a third party to meet the shortfall, for example, a levy on other employees in the federation or an insurance policy.
- But if industry in trouble may not be able to afford.
- Whatever happens at the time of discontinuance, there will be risk that the CDF will not be able to meet the benefits it has taken on.
- Again, this will mean that expectations are not met unless there is a reliable system for meeting any future shortfall.
- The likelihood of this happening is greater if the CDF premium basis is too weak, or if employers see it as a way of offloading liabilities cheaply —
- this risk can be minimised if access to the CDF is restricted (e.g to employers who go insolvent).
- also affected by investment policy under CDF and performance and there is a need for regular actuarial reviews to monitor likelihood

3 (i) Possible methods

Offsetting

In return for keeping all their pension, the member may grant their former spouse an enhanced capital sum or a higher percentage of the former matrimonial home.

Earmarking

This can include commuted cash lump sum and the payment of death in service benefits to the ex-spouse on the member's death.

The ex-spouse remains linked to the former spouse until their retirement and the former spouse forfeits any rights to the ex-spouses pension on the member's death or on re-marriage.

For a young divorcee the likelihood of re-marriage is quite high and her financial settlement should account for this

Pension credit

This effectively makes them a deferred member of the scheme while a debit is made against the ex-spouses pension to reflect this.

The ex-husband should consider topping up his pension to compensate for the debit made against his scheme benefits

The divorced spouse can then choose to leave the deferred pension in pension scheme or transfer it to an occupational or personal pension scheme of their choice

Where the ex-husband is a member of an unfunded scheme the divorced wife will have to leave the benefits in her ex husband's scheme.

Financial Considerations

For pensions sharing purposes the most practical method of valuing the pension is to use the scheme's cash equivalent transfer value basis.

This method is not entirely satisfactory, as it does not take account of potential salary & promotion increases before retirement
discretionary increases

any surplus or deficit in the scheme

any death benefits

The cash equivalent transfer value is unlikely to take account of the exact age of the spouse

and will make a global assumption of, say, 90% married.

When negotiating a financial settlement e.g. for offsetting against other financial assets an individual calculation may be made using exact member & spouse details

or be calculated on a "past service reserve" basis

or share of fund to allow for any surplus/deficit in the scheme

Any administrative costs incurred by pension sharing may be passed on to the divorcing couple, either directly or via reduced pension benefits

(ii) **Possible Methods**

Discretionary benefits paid — giving trustees scope to reward "deserving" cases

Proof of cohabitation is generally an acceptable criterion

— there could still be problems in determining what is a reasonable length of time to be recognised as an established couple?

Trustees can determine their own definition of dependency — thus by default can allow only the outdated image of working partner and a homemaker.

A broader definition could be of “financial interdependence” — e.g. where the a partner relied upon a second income to maintain a standard of living which had depended on a joint income prior to the employee's death

Financial considerations

Broadening the definition is likely to involve higher costs for the scheme

The exact “definition” will influence the chosen assumption of % of members with spouses and hence influence the projected cost

The actual “increased” cost is probably not very high — most actuaries assume a relatively high “% married” in their funding assumptions (e.g. 90%).

In contributory schemes unmarried members usually pay the same contribution as married members — this is perceived as being inequitable

If the spouses death in service benefit is insured the rate will be a function of the “definition” and the insurance company's contract terms

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(i)

- one possibility is to pay claims made by beneficiaries when they arise
- so that no monies are put aside to fund for the claims
- although the company may wish to establish a book reserve
- this method has minimal cash outflow initially
- although the cashflow will increase greatly later on when eligible employees have retired
- and it is possible that the company may not have the resources to meet the cashflow at this time
- so that there is little security of the benefit for the member
- a variant of this approach is to pay annual insurance premiums as they arise during the retirement of the member
- a second possibility is to establish a fund at the retirement of a member
- either by means of a capital payment at that time
- or by a series of payments for a number of years after retirement
- the fund would be calculated to be sufficient to meet the cost of claims/insurance premiums during the eligible period after retirement

- assumptions will therefore be required in a number of areas including medical insurance price inflation, investment returns and the mortality rates for members
- medical insurance price inflation can be determined using historic trends
- and the investment return needs to allow for the appropriate tax treatment of the fund
- this approach also has minimal cash outflow at the outset
- although potentially large capital payments will be required when members start retiring
- during the course of the scheme the adequacy of the fund will need to be monitored
- and adjustments made either by means of further payments or offsetting against future retirement payments (if there is a surplus)
- the final possibility is to establish a fund over the working lifetime of the member
- which is calculated to be sufficient at the retirement age to meet subsequent costs
- although if the member retires early, the actual fund will be inadequate and will require further payments
- again assumptions will be required to determine the size of the necessary fund at retirement
- and the contributions necessary to achieve this fund
- which will also need to be monitored for their adequacy on a regular basis

(ii)

- this final approach is the preferred approach
- because the cost is paid at the same time as the employee is providing services to the company
- and if the fund is adequate there will be no need for further payments after the employee has left the service of the company
(but give appropriate marks for well reasoned alternative)

5

- (i) Lower yields lead to a higher cost of financing pension & other long term benefits for a given level of defined benefits
for example a typical joint life annuity might cost around 30% more if expected long term inflation and hence nominal bond yields fall by 3%
There are two practical choices
Pay more — may be unpalatable to scheme sponsors
Invest in higher returning assets and hence riskier assets e.g. investing in corporate bonds rather than government bonds to target the added yield.
The promised benefits from completed service are generally clear and hence will not be affected
But scheme sponsors will review the additional cost and future benefits may be modified

or the scheme replaced by a defined contribution arrangement
Schemes with fixed pension increases do not have any flexibility to adapt to periods of unfavourable experience

Benefit design with a low discretionary content is inflexible hence sponsors may consider increasing the discretionary content e.g. pension increases

When the fixed increases are greater than the inflation rate it is likely there will be rises in the real value of pensions

Similarly periods of deflation would see rises in the real value of pensions even if the scheme had no escalation of pensions in payment

For many members it could result in a higher real pension at retirement than might have been anticipated

For scheme that secure benefits at retirement by the purchase of an annuity, lower expected inflation and low real investment returns will be reflected immediately in more expensive annuity rates

- (ii) Members will be directly affected by a long term change in inflation
However, an analysis of true costs will usually be based on contributions, benefits and expenses which are fixed relative to inflation
The level of inflation is irrelevant and the expected costs or resulting benefits will only depend on the real returns & real level of expenses
In conclusion lower inflation has no meaningful effect on the value of the defined contribution arrangement
But real returns may differ according to the level of inflation
Many pensioners buy level pensions and even with very low inflation the pension will be severely eroded for long lived pensioners
With low inflation there is more chance that inflation will subsequently rise in the future
The propensity to save may differ in a future period of low inflation (logically or illogically)
The level of expenses charged might differ in a low inflation environment, although in real terms they should be similar
Different generations of members may achieve wildly different pensions for effectively identical contribution patterns
As mortality improves the cost of the pension increases. This increase for level pensions is more significant in times of low inflation than in high

6 Death Benefits

- *Lump Sum*

Group Life policies are the most common method

But may also be stop loss or catastrophe insurance

Insurance Companies usually charge for it a recurrent single premium basis

It is often a very competitive market often representing good value for money compared to the expected claims

For larger scheme a "unit rate" may be determined at inception according to the age & sex distribution and applied to the total sum assured during the period of guarantee

This method reduces the administration needs as members leave and join the scheme

Experience / profit sharing is also relatively common for large schemes

A free cover level, usually expressed as a maximum per individual, is the amount up to which life cover will be provided without medical evidence.

- *Spouses death in service pension*

This is insurance to cover the pension payable to the spouse in the event of the members' death.

The insurance may be precise (i.e. insuring the exact pension) or more approximately by simply increasing the lump-sum payable on death under a group life policy

Annuities

Non Profit deferred annuities — purchased as a means of extinguishing a schemes liability to a member with an entitlement to a deferred pension

A life office has to match the policies with a cautious investment policy as there is a significant re-investment risk

Immediate Annuities — purchased by a single premium to remove a liability to a current pensioner

Immediate annuities may be level, increasing at a fixed rate or increasing in line with a given index

Advantages & Disadvantages

- *Lump Sum*

Advantages

Provides greater predictability in the cost of the death benefits

Reduces the large variability in the amount and timing of death in service costs in an uninsured scheme

This is particularly important for small schemes which are vulnerable to adverse mortality experience with the possibility of a small number of large claims rendering the scheme insolvent.

Insurance alleviates the liquidity problems of paying large claims all in one go

Disadvantages

In the long run the insurance company charges premiums to cover expenses and a contribution to profit as well as covering the actual cost of the benefits paid

- *Death in Service Pensions*

Comments as above but there are less liquidity problems and less risk of unpredictable cashflows compared to the lump sum death benefits

Insurance terms can appear poor compared to death in service lump sum policies

Lump sum insurance does not provide an exact match

- *Immediate annuities / Deferred annuities*

Advantages

Removes the mortality risk

Removes the investment risk

Disadvantages

Loss of any mortality & investment profits

Purchase price has to cover insurance company expenses & profit contribution

The Insurance company will price the annuities assuming a matched investment policy i.e. backing with fixed interest stocks

There is an immediate liquidity constraint when buying the annuity

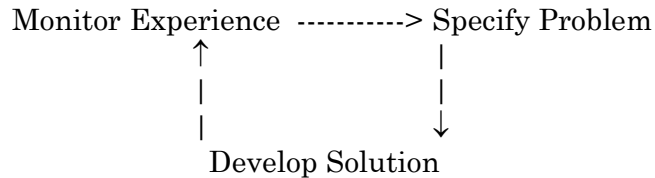
Future additions of discretionary pension increases becomes more difficult

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(i)

- example of control cycle used by all businesses

The form is:



The other inputs are:

- professionalism
- essential for setting the context of actuarial work
- must act with integrity and objectivity
- must demonstrate competence
- Economic Environment
 - sets scene to ensure cycle is relevant

In specifying the problem must:

- give assessment of risks at hand (e.g. want to reduce financial risk)
- allow analysis of alternatives for design of plans for benefits/contributions
- specify strategic direction

In developing the solution must:

- consider available models
- set assumptions

May also consider:

- need for reserves
- levels of contributions
- alternative investment/reinsurance options
- alternative solvency definitions

In monitoring experience must

- ensure using dynamic/relevant models
- use monitoring process to refine problem definition/development of solution
- assess reasons for departure from assumptions

- (ii) Should monitor continued appropriateness of matching policy regularly, as specified in control cycle

Should:

- review liability structure
- any changes will alter solution
- e.g. benefit improvements or membership profile change
- review funding position
- e.g. surplus as a result of many early leavers
- investment performance
- may be out of line from other funds used in setting parameters
- manager may have performance objective
- greater restrictions in objective — less appropriateness of other fund performance in setting parameters
- index fund for benchmark investment allocation may be more appropriate
- attitude of sponsor to risk

- (iii) Information Required:

- Precise objectives
- ensure appropriate data/method used
- define risk that is being measured
- define time period to be considered

- example of risk
(e.g.) 95% probability of funding position over 100% for 10 years)
- example of objective
(e.g.) highest possible return meeting risk criteria)

- time horizon important
 - credibility of results are time dependent
 - sponsor may be considering short timescale
(e.g. 5 years)
 - so model needs short term assumptions
 - often easier to set assumptions for longer period
(e.g. 20 years)
 - need all of data for regular funding review
 - in addition need terms or any options/guarantees
 - need funding method
 - and assumptions used to set funding target

- need number of simulations
 - e.g. need 10,000 to meet 5th percentile criteria

(iv) Outputs may be:

- for any given investment policy:
- statistics (mean, sd, etc.) on distribution of possible future valuation results at horizon time
- range of sensible investment policies for given risk/return profile
- known as “efficient frontier”

- statistics on distribution of net cash flows from fund for each year to time horizon (to assess need to realise assets etc.)

- any of above under alternative assumptions for sensitivity analysis

These results can be used, in particular,

- to understand sensitivity of proposed strategies
- bearing in mind parameters will not be borne out in practice
- robustness of policy may be important
- may assess a few reasonable candidates for investment policy

- use outputs to discuss alternative assumption with client and investment manager
- to help set performance criteria
- do not overestimate power of asset/liability modelling
- main use is to clarify objectives/give direction to client/investment manager discussions