

EXAMINATIONS

September 2002

Subject 404 — UK Fellowship Pensions

Paper One

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.

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Chairman of the Board of Examiners

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1 Debt on the employer

The basic aim of the legislation is to attempt to ensure that a scheme will have sufficient funds to provide all pensioners with immediate annuities and all non-pensioners with individual transfer values.

If the value of the scheme's assets are less than these liabilities the shortfall will be treated as a debt due from the employer to the trustees

The trustees instruct the scheme actuary of the date of the calculations

This can be at any date after the commencement of the winding up but not later than the time a relevant insolvency occurs

The assets are valued at audited market value

The liabilities are valued on the MFR basis

Pre & Post 6 April 1997 wind ups are treated slightly differently

For multi-employer schemes debt is proportioned by the Trustees

Priority of benefits

The Pensions Act 1995 imposed statutory overriding new provisions about which liabilities take priority on winding up

Applies to all schemes that are subject to the MFR

The regulations do not apply to Schemes whose winding up commenced before 6 April 1997

There is a ten year period commencing 6 April 1997 during which a transitional priority orders are in force

The scheme actuary must calculate the amounts of the liabilities in each of the relevant categories

The calculations are as at the crystallisation date — usually the date the winding up begins

Expenses are a priority

The pre 2007 priorities are:

Category 1: Liabilities derived from members AVCs

Category 2: Liabilities for benefits already in payment and are secured by insurance policies (excluding pension increases)

Category 3: Liabilities for other benefits in payment (excluding pension increases)

Category 4: Liabilities for contracted out benefits (excluding pension increases)

Category 5: Liabilities for pension increases on benefits in categories 2 & 3

Category 6: Liabilities for pension increases on benefits in category 4

Category 7: Liabilities for other accrued benefits (with pension increases)

Post 2007 priorities:

Categories 1,2 & 3: as per pre 2007 priorities

Category 4: Liabilities for benefits which have accrued but have not yet become payable (excluding pension increases)

Category 5: Liabilities for pension increases

Generally well answered. A large proportion of candidates didn't mention the future changes in the priority orders and the transitional requirements.

2 (i) *Implications*

An increasing expectation of life means the pension is paid for a longer period

And hence the cost of the pension increases

Insurance companies price annuities using up to date estimates of current and future mortality hence the cost of an annuity increases

An actuarial valuation should allow for the best estimate of mortality in retirement. If mortality is underestimated the overall cost of the pension benefit could be significantly underestimated.

Standard mortality table such as PA(90) are now out of date in terms of amounts and the shape of the decrement

A simple adjustment to PA(90) is considered too crude

More up to date mortality tables such as PMA80 or PMA 92 should be used

But even these need adjustments to allow for improving mortality

Recent mortality improvements have been greater for males than females but female mortality still remains lighter than male mortality

Future benefit designs possibilities

Increase Normal Retirement Age for future benefits

Limit early retirement options especially if the terms are not actuarially neutral

Consider reducing the amount of the pension benefit as the cost is increasing e.g. reduce future accrual rate

Consider introducing a cash benefit rather than a pension benefit for members (i.e. transfer the post retirement mortality risk from the scheme to the member)

The pension scheme could be switched to a defined contribution arrangement with the member ultimately bearing the mortality risk

Appropriate credit for other suitable possibilities.

But to subject contribution of trust deed and rules and section 67 considerations.

- (ii) Improved longevity means that the cost of lump sum death in service benefits reduces
Insuring the benefit should represent good value as this is a very competitive market
The trustees may consider “self insuring” as the mortality risk is reducing
The employer may consider improving the death in service benefits as the cost is decreasing
The pre-retirement mortality valuation assumption is not a very significant demographic assumption (unlike the post retirement assumption)
But it is still important to not overstate the mortality as it will understate the pension liabilities
Spouses death in service rates will allow for the improving pre-retirement mortality of the member
Which will reduce the cost/liability
But will also allow for the increased longevity of the spouse
Which will increase the cost/liability

(i) Generally well answered. Very few candidates mentioned the changing shapes of the mortality curves and possible amendments to it to take account of improvements.

(ii) Poorly answered. Most candidates talked about the reserve held for each member and how this compared in value to the death benefits.

- 3** (i) Fixed rate revaluation
Simple to administer/communicate.
Benefit is very much more valuable to older members than younger.
- Final salary (individual salary growth)
Most simple administratively — no need to revalue each year's accrual separately.
Need to give LPI revaluation to early leavers.
Need procedures for employees who switch between part/full time.
Benefit more valuable for high flyers, etc.
- Price inflation
Probably capped at a fixed percentage.
Revaluation not totally under employer's control, but can limit risk by suitable bond investments
Rather than revalue each month's accrual separately, probably develop broad-brush approach for revaluing accrual at yearly intervals.
- National average earnings
Similar comments to price inflation, but bond investments don't match so well.
Relatively high rate of revaluation, so value more equal across ages.
- Investment returns capped/collared
Could use scheme returns or some index.

If 0% collar, risk to employer unless hedging cost is deducted from return.

Generally, employer can match assets to liabilities
As price inflation re administration.

Discretionary

On top of any of the above, but most likely on top of capped price inflation or no revaluation.

Gives more flexibility if employer funds for discretionary awards, as likely to have a margin over solvency.

But employees may develop higher expectations than employer wants to meet.

Or they may assume that discretions won't be awarded — so cost is higher than value of employee appreciation.

If procedure for determining awards is too specific, the flexibility is compromised.

Who determines the discretionary awards: trustees or employer? How would governance disputes be settled?

Similarly, who decides investment policy? Trustees may favour risky policy with surplus being distributed to members, but employer picking up tab for deficits

Also difficulties from FRS 17 in that discretionary revaluations will result in a hit to profit each time a discretionary increase is granted, unless they are a constructive obligation.

- (ii) Scheme takes on risk post-retirement, so assets may not be sufficient, so risk that employer has to meet the balance of cost
- individuals may live longer than expected
 - investments may produce lower return than expected
 - uncertainty about whether dependants pension is payable, how long dependants will live, etc.
 - cost of administration, trustees, etc.
 - possible changes to taxation/solvency/other legislation.
 - may constrain investments

One-way option if members can choose whether to take guaranteed terms or purchase annuity elsewhere.

Also possible one-way option in that if surplus does emerge, employer may not get access to it.

Will members expect schemes to offer full range of choice available in commercial market — impaired life, investment link, etc? Risk of not meeting expectations.

If guaranteed terms only apply at particular ages/types of annuity, risk that some members will not be able to use them — perceived discrimination.

It may prove difficult to change the terms in the future even if they become inappropriate.

From employee point of view, if terms prove generous, risk of deficit arising and scheme unable to meet benefits.

Terms may turn out to be ungenerous but employees accept them by default and so get less than they might do now.

(i) Generally not very well answered. Some candidates mentioned lots of different ways of revaluing but didn't discuss in enough detail the advantages and disadvantages of each.

(ii) Fairly well answered.

4 (i) Benefits

Members

A major risk is the security of the promised benefits (i.e. are there sufficient funds to pay the benefits)

Will the existing benefit structure continue for future benefit accrual

Pension in payment may not be inflation proofed and may be eroded by future inflation

Employer

The actual costs of benefits may exceed the anticipated costs resulting from incorrect estimates of:

Salary growth

Mortality pre/post retirement

Withdrawal rates of members

Imposition of legislation

Contributions

Members

contribution rates are generally fixed

but may change in the future

risk of default by employer to pay future employer contributions

Employer

The cost of a final salary scheme is not entirely predictable

Hence future employer contribution rates are uncertain

And may be volatile

Cost are a function of scheme experience e.g. mortality rates, withdrawal rates etc.
and economic factors e.g. interest rates, inflation etc.
If experience is less favourable than anticipated by the actuary in his valuation, the estimate of cost will increase over time
Legislation eg MFR may require cash
May pay too much which ends up being taxed or given as benefit improvements

Investments

Employer

uncertain timing of cash flows / liquidity
Difficulties in matching liabilities e.g. pensions in payment
Insufficient funds to pay benefits
Poor investment performance (return on capital)
Poor investment performance relative to other investment managers
And the valuation assumption used
Re-investment of investment proceeds
Possible tax on investment proceeds e.g. removal of ACT
Possible fraud
Mismatched assets & liabilities will lead to greater volatility in pension costs but expect greater returns and hence lower costs in the longer term

Member

The investment risk is borne by the employer

Security of Benefits

Members

Trust Deed & Rules give some protection
Legislation protection
Covenant of employer e.g. financially strong
Security is a function of the points raised for member AND employer under benefits, contributions & investment above

Employer

Similar comments to member security

- (ii) Volatility of contribution rate is greater for small schemes as the variance of any "best estimate" valuations is larger for small schemes
In a small scheme, the experience of one member may significantly affect the liabilities e.g. on normal / early retirement / withdrawal

May need to take account of individual assumptions e.g. marital status of significant members, age of spouse, salary increases
The relative importance & sensitivity of some assumptions will differ compared to larger schemes e.g. marital status
Volume & reliability of experience data e.g. mortality
The covenant of employer may differ
Investment policy may need to be more conservative for a small scheme
Cash flow consideration may be more crucial e.g. a large retirement may mean negative cash flow or having to sell assets
Implicit / Explicit scheme expenses (admin, actuarial, legal fees)
Future legislative changes may have a greater impact on smaller scheme
Pensions are often “bought” out to reduce the investment and mortality risk

Strength of sponsoring employer important

(iii) *Member*

The risks are significantly greater for the member
The level of final pension benefits may turn out to be lower than expected
Investment risk is borne by the member
as is the “annuity” risk
the inflation risk
and the mortality risk

Employer

The contribution level is often fixed as a percentage of salary
If salaries increase at a rate higher than expected the cost in real terms may increase.

(i) Generally well answered. Candidates on the whole understood the issues but didn't necessarily get enough points down.

(ii) Again, generally well answered.

(iii) Generally good marks, although a number of candidates didn't mention that the employer's risks were limited and if they paid a fixed percentage then the main concern/uncertainty was the increase in members' salaries.

- 5** (i) (If candidate assumed members not told about the wind up then appropriate credit was given.)
Inappropriate to project on the basis of continuing contributions as contributions will cease on wind up.
On buy out insurance company will be more conservative in its pricing than the long-term basis, therefore inappropriate to project on long term basis.
Member's expectations will not be met; member communication is an issue.

Also consider any statutory requirements to give a projection & any actuarial guidelines.

Must meet disclosure regulations.

Consider the age of the membership.

Are members receiving independent financial advice.

Alternatives:

No projection, just quote the current fund

Projection with no future contributions.

Use different actuarial basis; market related or close to insurance company buy out.

Delay (within disclosure timescale) issue of statements until wind-up announced.

- (ii) No projection at all, just use current fund

Simple

if no projection given it cannot be accused of misleading

Any other projection will not (except by coincidence) equate to the actual benefit secured from the insurance company, no matter how much the basis is adjusted.

(Credit was given for sensible arguments for the other alternatives in (i))

- (iii) The format is different to that in previous years; important reasons for this.

Pension scheme is being wound up on DATE

From that date forward membership of an alternative pension scheme will be offered

After winding up date there will be no further contributions to the current pension scheme

from either member or the company.

Misleading to give a projection of the possible fund at retirement with those future contributions included.

Accordingly the projection shown only includes contributions up to wind up date

and is not directly comparable to previous years' figures.

Fund at wind up date will be used to secure a deferred annuity and insurance companies pricing of deferred annuities likely to be on a more conservative basis than the current projection

as a result of different underlying investment strategies

Hence the projection on this year's statement of the possible pension available from current fund has been amended to this different market-related basis.

This has the effect of reducing the expected amount shown

but not necessarily the actual amount you would have at retirement.

Further details will be issued when the insurance company quotations are received

Seek independent advice if unsure on best options

- (iv) Linking to salary is more like a defined benefit scheme but this is a defined contribution scheme; therefore the director is getting mixed up.

1 year's salary increase could vary a lot between members,

but fund growths likely to be similar over the last year depending on what fund choices are available,

but still difficult to give such a sweeping guarantee.

For new entrants just before the last anniversary there should be no problem in giving the guarantee as a full year's contribution on top of any fund growth should outweigh the salary growth on top of last year's projection.

For the scheme as a whole the mortality experience also matters e.g. if death benefits all insured then the scheme retains the member's fund on death, and this "profit" could be used to finance any guarantee.

However for everyone else the comparison of one year's salary growth versus the increase in the projected fund allowing for one year's extra contributions and one year's actual (rather than assumed) growth is less clear-cut.

Another issue is the optimistic long-term basis versus the market-related basis.

Results on the different basis will be worse for younger members.

The difference could be substantial e.g. a 37.4% $\{1 - (1.055/1.08)^{20}\}$ difference in the projected fund for a member with 20 years to retirement.

The overall cost could be very large and questionable whether company would be in a position to (or willing to) make up the cost.

(v) $F = \text{fund}$

$S = \text{salary}$

$$F \times (1.08)^{20} + 10\% \times S \times [(1.08)^{20.5}]/1.06 \times a_{\overline{20}|}$$

Where $a_{\overline{20}|}$ is an annuity payable yearly in arrears at $j\%$, $(1 + j) = (1.08)/(1.06)$

$F = \text{£}20,000$ and $S = \text{£}30,000$,
the projected fund is $\text{£}93,219 + \text{£}226,628 = \text{£}319,847$.

(vi) $\{1 - (93,219 \times [1.055/1.08]^{20})/319,847\} = 81.8\%$

(i) *Generally well answered. Almost all candidates recognised that it was inappropriate to issue the statements in their current format and suggested a number of possible alternatives.*

(ii) *Almost all candidates recommended an alternative with reasons.*

(iii) *Marks varied greatly for this part of the question. Generally candidates didn't explain in enough detail why the format was different, why the assumptions were different etc.*

(iv) *Very poorly answered. A large proportion of candidates didn't understand the implications of the suggestion, other than the guarantee would cost the company money.*

Only a few candidates tried to quantify this amount by considering a member x years from retirement.

(v) Generally well answered.

(vi) Generally well answered.

- 6** (i) Valuation balance sheets for each annual valuation
Market value of assets for each annual valuation
Asset class into which marginal amounts of new money were being invested
Investment return in the intervaluation periods on these asset classes
The “market” interest rate for the liability valuation
The salary escalation rate for the liability valuation
The pension increase rate for the liability valuation (particularly if linked to price inflation)
The employee contribution rate
And whether it is variable (e.g. depends on employers contribution rate) or fixed
The future service rate (standard contribution rate)
Split by age and sex
Breakdown of the liabilities
By category (e.g. pensioner, active)
By age and sex
Method of amortising surpluses
The valuation basis (traditional)
The valuation method
- (ii) (Appropriate credit was given for equivalent non formulae answers)
A contribution rate is required for the first year (i.e. the initial rate used for funding the scheme)
The asset value will be nil (unless a bulk transfer was received)
The liabilities will be nil (unless a bulk transfer was received)
Take the future service (or standard contribution) rate from the funding valuation
Where $i(t)$ is the interest rate on traditional basis
 $i(m)$ is the interest rate on the market basis
 $j(t)$ is salary increase rate on traditional basis
 $j(m)$ is salary increase rate on market basis
 $c(t)$ is the contribution rate on traditional basis
 $c(m)$ is the contribution rate on market basis
 AN is annuity at applicable interest rate
Multiply by $[(1 + i(t)) / (1 + i(m))]^n$
And by $[(1 + j(m)) / (1 + j(t))]^n$
And by $AN(i(m)) / AN(i(t))$
For each age

And sex
And subtract the employee contribution rate
This gives an approximation to the first years contribution rate on the market basis ($c^{(m)}$)
Calculate $((c^{(m)} - c^{(t)}) \times \text{payroll} \times \text{investment return in correct asset class over first year}$
Add/subtract from actual market value of assets at time 1 to produce adjusted market value of assets at time 1
From funding balance sheet at time 1, take actives value
And adjust as per future service rate adjustment covered previously
Similarly, adjust the value for deferred pensioners
Noting that revaluation in deferment replaces salary escalation
And adjust the pensioners valuation
By multiplying by $(AN(i^{(m)}) / AN(i^{(t)}))$
Calculate the market related surplus or deficit by taking the adjusted market value of assets and subtracting the market related liability value
And amortise the surplus/deficit
To determine the impact on the year 1 to 2 contribution rate
Calculate the future service rate in the same way as for year 0 to 1
And determine the employers contribution rate for year 1 to 2 by adjusting for the part service surplus/deficit
Continue the same calculations for the remaining years 2 to 10
Making appropriate assumptions about the investment vehicles which would be suitable (if the development of surpluses/deficits were very different compared to those arising from the traditional approach
For example, if surpluses under the market value approach would have been much higher than under the traditional method
It may not be unreasonable to assume the fund would have been invested more aggressively (e.g. in equities)
And to build in this effect in the projection

(iii) Smoothing methods

Average outputs over a fixed period (e.g. asset/liability values)
Say 3 to 5 years
Average inputs over a fixed period (e.g. assumptions)
Adjust salary inflation assumption in sympathy with investment assumption
For example, salary inflation rate could be set as equal to price inflation plus half the difference between the investment return and price inflation
Fix the employer contribution rate
And use the valuation results as a "healthcheck" on the continuing appropriateness of this rate
For example, by assessing the actual investment return which will be required if the employer contribution rate is to be sufficient to fund the benefits

And only change the contribution rate if the investment return assumptions becomes unrealistic
Or place a cap on the amount by which the contribution rate can change in any year
Bringing into account the impact of the cap in assessing next years contribution rate
Set up an investment mismatch reserve
So that if for example, there is a surplus which is supported by a highly equity biased investment strategy
The impact on the surplus/contribution rate of an equity fall could be assessed
And a provision made that part of these surplus assets would not be taken into account in conducting the funding valuation
If the market value methodology is based on an assumed investment policy
Move the assets of the scheme into line with the theoretical matching portfolio
Change the scheme from balance of cost to shared cost (so that the employees pay for part of any adverse experience and vice versa)

(i) Marks were generally disappointing as candidates generally didn't make enough points.

(ii) This question was generally poorly answered. Many candidates talked about different methods of conducting a market related valuation.

Very few candidates explained in detail how the calculations would be carried out. Very few candidates realised that the market value of the assets at the start would be zero, and most candidates used the market value of assets each year rather than projecting forward what the market value would have been if a different contribution rate had been used.

(iii) Again, this question was very poorly answered. Candidates generally didn't generate enough ideas.