Faculty of Actuaries **Institute of Actuaries**

EXAMINATIONS

April 2000

Subject 402 — UK Fellowship Life Insurance

Paper One

EXAMINERS' REPORT

1 According to GN2, the following would normally be included in a Financial Condition Report:

- The purpose of the report.
- The extent, if any, to which the report falls short of its stated purpose.
- The conclusions that can be drawn about the financial position of the office at the particular time at which the investigation is carried out.
- Relevant historical development of the company and any conclusions that can be drawn from that development which may have implications for the future of the company.
- Comments on particular aspects of the historical development of the company, such as any policy conditions, prospectuses, methods of selling etc., which have led to Policyholders' Reasonable Expectations being formed with financial consequences for the company.
- A commentary on the business of the company and the environment in which it is expected to operate.
- A commentary and opinion on the implications of the Dynamic Solvency Testing or other financial investigations with special reference to any future external factors which present a threat to the company's financial security and the options open to the company to deal with those factors.

Despite being pure bookwork, this question was answered very poorly by most candidates.

2 The Modified Statutory Basis requires the separate recognition in the accounts of a company of the Technical Provisions, the Shareholder Reserves and the Fund for Future Appropriations.

The Technical Provisions represent the amount set aside to pay policyholder benefits. A different basis to that used for the Statutory Returns may be used.

Unallocated items appear in the Fund for Future Appropriations.

Unlike the basis used in the Statutory Returns, which focuses on solvency, the Modified Statutory Basis looks for a more realistic reporting of a company's profits. Acquisition costs are deferred, through the inclusion of a DAC asset. This involves amortising the acquisition costs over their expected period of recovery.

Asset valuation methods may differ: in practice the statutory Basis imposes admissibility limits on the amount of certain assets which can be taken into account.

In addition to changes in the calculation basis, the Technical Provisions may differ from the mathematical reserves included in the Statutory Returns.

This is because:

- if there is a zillmer adjustment in the Statutory Returns, then this is a form of deferral of acquisition costs and should be removed if there is an explicit DAC asset;

- alternatively, the zillmer adjustment may be increased to reflect the true acquisition costs, rather than the amount in the Statutory Returns which is limited to 3.5% of the sum assured if that is lower.

- contingency reserves have to be removed - for example resilience reserves and "close-down" expense reserves.

Unrealised gains and losses have to be identified and allocated to the appropriate part of the accounts.

The method has no effect on the amount that can be transferred to shareholders. This is still subject to the rules governing the Statutory reporting basis.

This is the first time this topic has been tested in the examinations, but nevertheless most candidates were able to reproduce the main points from the core reading adequately.

3 (i) Unexpired Premium Reserve, is usually taken as a fraction of the annual premium corresponding to the proportion of the year up to the next annual renewal date. The fraction usually makes some allowance for expenses, e.g. commission, incurred at the renewal date. If the premium is paid monthly rather than annually it is the proportion of the premium up to the next monthly renewal date and paid prior to the valuation date.

The incurred but not reported (IBNR) claims reserve is the reserve to cover claims that have occurred but which have not been reported to the company as at the valuation date. The company's past experience as regards IBNR claims will be the key determinant in calculating the reserve required.

A deficiency reserve will be required to cover any future inadequacy of premiums. The extent of the deficiency reserve will be over the rest of the guarantee period for the premium levels being charged.

An experience refund reserve will be required if the contract offers an experience refund. For example a proportion of the premium is returned if claims experience is below a specified level. This reserve will need to reflect the period until the next refund date and the experience of the scheme to date.

(ii) The incurred but not reported (IBNR) claim receives will need to be looked at in two parts because of the deferred period before benefits start to be paid:

- A part relating to the potential claims currently within the deferred period
- A part relating to the true IBNR claims

The two types of approach to allow for the first part above are

- Assume the premium is not earned until the deferred period is complete
- Calculate an IBNR reserve based on past experience

A reserve for claims in payment will also need to be held. The value could be calculated using disability annuities that take in to account both death and recovery from the disability. Alternatively one could simply hold a multiple of the benefit in payment.

This was straightforward bookwork and generally well answered.

4 (i) As a without profits contract with a guaranteed benefit term assurance is sold almost entirely on price, the main action would be to review premium rates with a view to reducing them.

It might be possible to reduce commission in order to improve premium rates or it may decide that increasing commission may increase sales.

The company might be prepared to reduce its profit requirement from each contract or find that its experience may be good enough to reduce premiums and still maintain profits.

The company might review the limits at which it seeks medical reports or examinations in the underwriting process.

A renewable term assurance policy which is issued for an initial short term but with guaranteed insurability on termination would reduce the initial premium rate although the rate would increase on renewal.

Adding an option to convert to a savings product will increase the premium but may also increase marketability and volumes sold.

If reinsurers can offer attractive risk premium rates, or provide capital financing on good terms, reducing the retention limit might enable premium rates to be reduced.

Increasing marketing expenditure on developing alternative distribution channel (e.g. e-commerce) may increase sales.

(ii) Review premium rates - in order to complete the review the company would need up-to-date analyses of mortality, expenses and persistency. Interest is not a key item as reserves are not large. A change in commission rates would need discussion with the sales areas.

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Reduce profit requirement – the company will need to consider whether increased volumes and economies of scale would lead to an increased overall profit.

Review Underwriting limits - Healthy lives who can be accepted more easily are more likely to effect a policy. It is necessary to know the distribution of policy sizes and to compare the costs of underwriting saved with the extra claims that might arise if medical evidence is not obtained. Even if this results in no cost saving, added convenience might still increase business volumes.

Add conversion option - data to determine option costs largely come from North America and need to be interpreted with care in other territories. Need to establish whether this will significantly impact sales.

Reduce retention limits - it will be necessary to consider the increased administration costs that would result.

A cost/benefit analysis of any proposed marketing expenditure is required.

With all of the above proposals, it is necessary to assess the competitive position if implemented and the likely business volume that will result.

Most candidates suggested appropriate actions in answer to this question. Successful candidates simply came up with more suggestions.

5 (i) Surrender values should

- take into account policyholders' reasonable expectations
- not exceed earned asset shares, in aggregate, over a reasonable time period
- be based on smoothed earned asset shares in order to be equitable to both leavers and stayers.
- not appear too low compared with premiums paid at early durations

- be consistent with projected maturity values at later durations
- take into account projections given at the point of sale
- take account of surrender values offered by competitors
- not be subject to frequent change in normal economic conditions
- not be excessively complicated to calculate, taking into account the computing power available.

(ii) A unitised with profits contract has a number of units allocated which is increased with each premium paid. Bonuses increase either the unit price, or the number of units, or both, from time to time. The benefit on maturity or death is the number of units allocated multiplied by the price.

On surrender the company will reserve the right to apply a market value adjustment factor, either upwards or downwards, if investment conditions dictate. The company will need to take care in how it establishes PRE regarding application (or not) of MVAs. Descriptions in literature and past actions are the main ways of establishing PRE.

Notwithstanding the application or not of an MVA the policy might contain a clause such that the surrender value is subject to a deduction expressed as a reducing multiple of the premium in the early years. This deduction makes allowance for the period when the asset share is negative, even if investment performance is as expected. Some value is given which means early surrenders are subsidised by later ones and do not appear too low. This is not inconsistent with the principle of paying earned asset shares in aggregate over a period.

A positive MVA (often called terminal bonus) is normally applied on death and maturity as well as surrender. A lower rate might be applied on surrender. If only a proportion of any positive MVA is applied on surrender, it will enable additional profit to be made. This can be set so that the same surplus arises from a cohort irrespective of the surrender rate.

In order to establish whether to apply an MVA the company needs to keep a record of the earned asset share, either on an individual policy basis or as a cohort.
This can be done by running a shadow unit fund to which the actual experience of the cohort of business is allocated.

The application of positive MVAs or terminal bonus will incorporate smoothing required by the company's philosophy. Applying the same rates or a proportion of them generates the same smoothing. It also ensures consistency with maturity values.

Depending of the frequency of change of MVAs at maturity, the basis will be stable.

As the same processing is used for maturities and surrenders there should be no computational difficulties.

(iii) In order to minimise the premium the original term should be extended.

The starting point for the conversion would be to consider the premium for a new policy for the required sum assured less the paid-up sum assured of the existing contract.

The paid up sum assured would be that supported by the earned asset share.

As cover is increased by the additional term, further underwriting should be carried out. It should be borne in mind that the act of moving house is a selective event and anti selection will be unlikely. A fully completed proposal should be adequate evidence.

As the premium is likely to reduce additional commission will be minimal, if any. The new policy can be calculated on commission-free terms.

It will also be possible to improve the terms for the new policy by stripping out sales related costs. It is necessary to leave administration costs within the rates because of the costs of processing the conversion, underwriting, production of key features documents, etc.

Units equal to the earned asset share can be allocated to the policy at conversion as if a single premium was paid on a new policy.

If the asset share is very different from the face value of units this can generate problems: either in explaining why fewer units appear to have been cancelled on conversion or in dealing with terminal bonuses which have effectively been capitalised.

To avoid these problems the nominal unitholding can be maintained and the current earned asset share also carried forward. This is really only practical if asset shares are tracked using a shadow fund.

It is necessary to review the qualification status of the policy for tax purposes. It is unlikely that the premium will reduce so much as to make the altered policy non-qualifying.

Part (i) was very well answered, as expected from a standard piece of bookwork. Adopting the principles to the UWP contract in Part (ii) was not answered well. Very few candidates came up with a reasonable approach to the conversion in part (iii).

6 (i) The valuation should confirm to generally accepted actuarial methods and principles and allow for all benefits and options.

The structure of a unit-linked contract is such that the company's liability is denominated partly in terms of units and partly in monetary, i.e. non-unit terms.

This leads to a requirement for a unit and non-unit reserve.

The company is required by legislation to match the units it has actually allocated as closely as possible. In practice companies are expected to match exactly, except in exceptional circumstances.

Even where mismatching is permitted, typically in the case of index-linked contracts, the legislation requires that the assets held have a value which matches that of the unit liability "as nearly as maybe". If the unit liability is mismatched, an appropriate reserve should be established.

Hence in either case the unit reserve can be taken as the value of the allocated units. This would normally be using a "bare" unit price with no allowance for buying or selling costs.

The non-unit reserve is the amount required to ensure that the company is able to purchase units in accordance with its funding plan, pay claims and meet its continuing expenses without recourse to further finance.

The product design often includes factors that can generate marked discontinuities, such as:

- Unit allocation percentages with specified variations
- Management charge fluctuations due to movements in the value of the unit fund
- The allocation of "bonus" units at certain times
- The conversion of capital units to accumulation units.

It is necessary, therefore, to consider the year-by-year incidence of the various components of the cash-flows for each policy to determine if and when a non-unit reserve is required. Hence a discounted cash-flow method needs to be used.

It is necessary to check that the sum of the unit and non-unit reserves is not less than the surrender value. Subject to this condition being met, it is permissible to hold a negative non-unit reserve under a contract. In aggregate, however, the non-unit reserves may not be negative.

Aggregate reserves need to be restablished if the valuation basis is not strong enough to withstand changes in investment conditions (resilience) or if there is significant mismatching on assets and liabilities on a cash flow basis

Other reserves, for example, for any maturity guarantees or to cover any potential future liability for tax on currently unrealised gains can also be held in aggregate.

(ii) Unit growth rate 6-8% gross, depending on assets in the fund

Non-unit interest rate	3-5% gross, reflecting returns on fixed interest assets
Expenses	£20-30 pa depending on results of recent expense analyses and allowing for possible closure in 12 months Plus 0.1% investment costs escalating at 4-6% to be consistent with investment assumptions
Tax rate	20-23% based on current assessment of the tax position of the office
Mortality	not core assumption, based on recent analyses AM80 ult – 3 years either explicit AIDS allowance or margin in basic mortality assumption.

Withdrawals 0% as nil lapse assumption is likely to be the most conservative.

(iii) In the following year the inflow comes from the 1% AMC, thus approximately assuming a 7.5% gross growth rate or say 6% net for half a year

$$10{,}000 * 0.01 * 1.03 = 103$$

outgo is expenses net of tax relief

$$(20 + 10.3) * .8 = 24.24$$

Thus there is massive positive cashflow

In following years fund will probably grow faster than expenses so future cashflows will all be positive.

This means that if there is a non-unit reserve, it is likely to be negative. This is possible as there is a surrender penalty.

The surrender penalty allows a negative reserve

However, if this is typical, then no policy is likely to have a positive reserve.

As a result no negative reserve can be held as an offset to a positive reserve.

The non-unit reserve is likely to be zero.

The first two parts of the question were well answered. Part (iii) required a very simple numerical demonstration which few candidates achieved.

7 (i) The estate will vary in line with the investment return earned on the assets in which it is invested.

The mix of assets may be that underlying the with profits fund. Alternatively, the company may allocate different assets to its estate than to its with profit policies.

In addition, the estate will change in value to reflect differences between actual experience and that assumed when calculating asset shares.

This includes differences between the pay-out in respect of a policy and the corresponding asset share.

These may be due to:

- The smoothing of pay-outs at maturity.
- The decision to set maturity values above or below asset shares, either to reflect items of a non-investment nature or to distribute part of the estate to policyholders.
- A policy of setting surrender values below the underlying asset share.

There may also be differences between actual expenses and the cost of mortality and the levels assumed in the premium basis, on which the asset shares are based.

These may be because the premium basis loadings are unrealistic, or because of exceptional items, such as compensation payments.

The value of the estate will also reflect financial strains and releases arising from business outside the with profit fund.
These include:

- New business strain on the unit-linked endowment assurances.
- Valuation strains from the immediate annuities, due to differences between the premium and valuation bases or changes in the valuation basis (e.g. due to revised mortality assumptions).

- Mismatching profits and losses from the immediate annuities, due to investing the premiums in assets other than fixed interest securities of appropriate term.

- Mortality and expense profits and losses from both the unit-linked endowment assurances and the immediate annuities.

Because the starting point for the calculation of the estate is the total net assets shown in the Supervisory Returns, the value of the estate will also be affected by the presence of any inadmissible assets.

Finally, the company may make transfers from the asset shares underlying with profit policies to the estate, to reflect the enhanced investment freedom the estate permits.

(ii) One or more of the following factors could cause the estate to become negative:

- The excessive overpayment of maturity values, either through smoothing or as part of a deliberate policy.

- The requirement to fund a high level of new business strain, due to rapid growth.

- Large expense overruns, allocated to the estate.

- Exceptional items, such as compensation payments or guarantees, which it is decided should not be deducted from policy asset shares.

- Large financial strains from the unit-linked and without profit business, due to an onerous valuation basis.

- Large financial losses from mismatching the immediate annuities.

The implications of a negative estate are potentially serious.

It implies that the company's total net assets, excluding those required to meet the liabilities under other types of business, are below the total asset shares underlying with profits policies.
This could have important consequences for future pay-outs and hence PRE, which is normally based around paying asset shares at maturity.

The negative estate could also have an impact on the company's free assets and hence on the investment freedom underlying its with profit fund.

The precise response depends on the cause of the shortfall. In particular:

- Whether it is a permanent loss, due for example to overpaying on maturities, or a temporary one, due for example to cashflow timing differences, which can be expected to vanish before significant numbers of policies mature.

- Whether the loss is real, such as mismatching, or illusory, such as a valuation strain.

- Whether the loss is one-off, such as a single large compensation payment, or ongoing, such as an expense overrun.

It will therefore be necessary for the company to investigate the cause and, if necessary, take remedial action. This might include seeking additional capital, either through financial reinsurance or by demutualisation. Alternatively, it may be considered acceptable to rebuild the estate by including an explicit contribution to it in the calculation of asset shares.

(iii) Subsidising new business may be a legitimate use of the estate, if it is carefully controlled and part of a credible business strategy.

An example might be maintaining a presence in an important market for the company, while it reduces costs to finance the improvement on a longer-term basis.

There is however the danger of depleting the estate below an acceptable level. This depends on the size of the estate relative to the strain likely to be placed on it.

It would have implications for the level of the company's free assets and on its ability to adopt a suitably unconstrained investment policy in respect of its with profit business.

It is important therefore to consider the PRE of existing policyholders and the possible alternative uses of the estate.

There was a wide range of answers to this question, with the successful candidates gaining high marks and the poorer candidates finding very few of the relevant points.