

EXAMINATIONS

September 2004

Subject 402 — UK Fellowship Life Insurance

Paper One

EXAMINERS' REPORT

Introduction

The attached subject report has been written by the Principal Examiner with the aim of helping candidates. 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.

M Flaherty
Chairman of the Board of Examiners

7 December 2004

This paper contained a number of difficult questions requiring application of a candidate's knowledge to the particular situation. As a result, some candidates struggled to complete the questions in the time allocated. Nevertheless, the good candidates performed well in these questions and were able to demonstrate their ability. The relative difficulty of the paper was taken into account in determining the pass level.

- 1** The basic equity principle states that the transaction should not affect the unit holders who are not involved in that transaction.

The company would consider whether the withdrawal is large enough compared to the size of fund to merit special treatment e.g. the transaction may be deferred because assets may take time to sell. Whether in practice a company would actually switch between offer/bid basis will depend on the company position and the nature of the underlying assets.

The company will consider the overall cash flow position of the fund after allowing for the withdrawal over the coming, say, week. If the company runs a larger box then it is less likely to have to switch as a result of this transaction

Start with the mid-market value of assets at the next valuation point. If the cash flow position is positive, then the fund is expanding, units are therefore being created and the price should allow for the costs of purchasing assets. If the cash flow position is negative, then the fund is contracting, units are being cancelled and the price should allow for the costs of selling assets.

The tax position of the fund should be considered. The allowance for tax may have assumed significant deferral of realisation of gains. If the withdrawal accelerates capital gains tax then the company should consider whether the fund has been charged enough tax.

Policyholders' expectations must be taken into account. The policy literature and PPFM will set out some basic rules regarding the calculation of unit prices.

This question was reasonably well answered, although some candidates did not discuss the specifics of the question and suffered as a result.

- 2** Investigations into the supportability of bonus rates:

This involves finding the reversionary bonus rates supportable by the current asset share allowing for expected future experience and target terminal bonus. The investigation should be split by e.g. term to run, new / exiting business, life / pensions, or conventional wp / unitised wp. If the rates differ by cohort then, in theory, the reversionary bonus will tend to move from the rate supported by mature business to that supportable by the newer business. The sensitivity of the supportable bonus rate to different future conditions would also be considered

The supportable bonus rate will be the ultimate desired level of reversionary bonus but the other factors discussed may lead to an answer that differs from this. For example:

- Smoothing policy
- PRE on smoothing which will be set by past practice and marketing literature, as well as PPFM
- The company's principles and practices of financial management (which will set out principles about smoothing practices and reversionary bonus declarations)
- The company's principles and practices of financial management (which will set out principles about smoothing practices and reversionary bonus declarations)
- Current bonus rates

The size of the surplus is also important. This is assessed via the statutory valuation and sets an upper bound for the distribution.

The source of the surplus this will indicate the most suitable method for distributing that part of the surplus. For example, if the source is a one-off feature such as large project expense, or unsustainable such as large capital gain then reversionary bonus would not be appropriate.

Current and projected future free asset ratio is important; higher reversionary bonus will increase reserves and reduce free asset ratios which might lead to future solvency problems.

Other issues to consider are:

- Whether the company has a strategy that, for example, looks to augment or wind down the estate through reversionary bonus enhancements / deductions.
- Competitors bonus rates (as bonus levels may impact new business)
- Asset allocation ; more fixed interest will generally be consistent with higher reversionary bonus since these assets are less volatile than equities
- Any recent legal judgements about surplus distribution

This was a fairly straightforward question that was generally well answered.

- 3** (i) The proposed method should produce reasonable results when the outstanding term is reduced substantially if the asset share is close to the surrender value since the terms offered will be consistent with the normal SV for conversions to short terms to run, which is a desirable feature.

By crediting the policyholder with the earned asset share, the company will have made no profits on the policy up to the date of alteration, so profit will tend to be less than for unaltered policies.

At early durations the asset share might be negative in which case the policyholder may lapse and re-enter, although this is unlikely given that new

premiums are likely to be more expensive given the recent fall in interest rates.

In practice the earned asset share is unlikely to be readily available for a without profits policy. If not, then the current SV might be a suitable proxy. For policies at an early duration, the surrender value will be greater than the asset share and the company could make a loss from using the surrender value. At later durations, the surrender value may be less than asset share so as to allow for profit up to the date of surrender. It may therefore be more appropriate to use in alterations as it would allow for profits on altered contracts to be consistent with those on unaltered contracts.

- (ii) The fact that the original premium basis is used should mean that the terms offered appear fair to policyholders, and future profits and guarantees will be consistent with those for the original policy. In particular, if the change in term is small, then the revised premium will appear consistent with the original premium.

The company may no longer have a record of all historic premium bases. If not, then the suggested approach is not possible. Even if it does have a record of these, they may not be held on the admin system. It would be time consuming and expensive to look the historic rates up manually, particularly if rates have changed frequently.

If existing premium rates are more favourable than historic rates, then policyholders could surrender and re-enter. Given the historically low interest rates, it is unlikely that existing premium rates are more favourable than historic rates, reducing the lapse and re-entry risk. The only policyholders who would effect an alteration therefore may be those for whom the original terms are more favourable than the company would now offer, such as those in ill-health who would be rated if they surrendered and re-entered.

Under the proposed method policyholders are effectively being charged twice for initial expenses and commission since these will be reflected in both the asset share and the premium rates for the revised benefits. Although alteration expenses will be incurred, these are likely to be less than the initial expenses and commission in the premium basis, particularly if the outstanding term is long (since commission allowance is higher). The premium basis should be adjusted to reflect this.

The reductions in interest rates since the policies were originally written mean that the original premium basis may no longer be appropriate. This would mean that losses would occur post alteration, and hence losses would occur over the total duration of the policy since earned asset share is being credited to the policyholder. As the policyholder has chosen to alter the original contract, the company is unlikely to want to continue to offer benefits based on the original premium basis in these circumstances.

Although the future losses would be no greater than on an unaltered policy, the increase in asset value resulting from a fall in gilt yields would not be being credited to policyholders with unaltered policies and would act to offset the future losses

In general, the suggestion would be better if current premium rates were used.

This was a tricky question that was relatively poorly answered. Most candidates identified that there was no profit accrued to date if the asset share was used but few considered administration difficulties. In part (ii) there was again little discussion of administration difficulties, the double counting of expenses, or the consistency for small changes.

- 4** (i) The accounting concepts that a life insurance company must adhere to in calculating the profits that have arisen during the year are as follows:

The “going-concern” principle — where profits are calculated assuming that the company will continue to exist in the future.

The “accruals” principle, where the company recognises revenue and costs as they are incurred, rather than when money is received, unless this is contrary to the prudence principle.

The “consistency” concept, where like items are treated similarly both within the reporting period in question and from one reporting period to the next.

The “prudence” principle, where revenue and profits are not anticipated in advance of them arising, and provisions are made for all known liabilities.

- (ii) **Going concern**

The main item in the basis affected by the “going concern” principle is the expense assumption used to calculate the PVFP of the existing business. The company will project its future expenses, assuming that it stays open to new business. The expenses will be spread over both the existing book of business and any new business that the company expects to write. However, in line with the prudence principle, the company will take care not to over-estimate the volumes of new business it expects to write. If this were to occur, then it could lead to the company allocating less of the future expected expenses to the existing book of business than is prudent.

The company will allow for the inflation of expenses assuming that the company remains open to new business.

The allowance for future tax will be based on the assumption that the company stays open to new business since closure to business can affect tax status. Similarly, closure can affect lapse rates and the persistency assumption will be based on an assumption that the company remains open to new business. The

assumption for the future asset mix, and hence return on these, will be based on the assumption that the company stays open to new business as will the assumption about future bonuses

Although the going concern concept might suggest that allowance is made for profits on future new business this is not done as it would contradict the accruals concept.

Accruals

The company will meet the accruals concept by projecting the cashflows according to when they are incurred as opposed to received. This means that premium income, investment income and so on will be projected based on when they are expected to be received rather than when actually received. Similarly, expenses would be accrued in the period to which they relate.

Again the company will not want to breach the prudence principle. For example, it would be imprudent to project 100% of the future premium expected, if the company in the past has had to write-off premiums due to non-receipt. This may particularly occur on group business, where an insurer may continue to provide cover even when the total premium is not received.

Although valuing future profits might be felt to contradict the accruals concept, this is not the case since the future cashflows relate to the activity of selling new business and it is this activity that is earning profit for the company.

Consistency

The consistency principle will be met in a number of ways:

- The assumptions used in calculating the PVFP should be consistent with one another e.g. the investment return assumption and the inflation rate assumption used for inflating expense will be chosen to be consistent with one another.
- Similarly, if the PVFP is calculated using dynamic assumptions, then the relationship between assumptions will be maintained as the assumptions vary. E.g. if investment returns increase, then it is also likely that inflation rates will increase and vice versa.
- The assumptions used for calculating the PVFP in this period should be consistent with the assumptions used for calculating the PVFP in the previous period. If the PVFP has been calculated using long term deterministic assumptions then it would be expected that the assumptions would not vary greatly from one period to the next.
- The exception to this may be if there has been a one-off shift in the market that is not expected to be corrected in the future.

- The assets and liabilities should be projected using consistent bases and methodology. For example, if dynamic investment return assumptions are used for projecting the investment returns expected on assets, then the same returns should be used to derive a suitable rate at which to discount the liability cash flows, at each future time period.
- There should be consistency in the bases used to calculate the future cash flows and the statutory reserves at each point in time in the future. For example, the assumptions used to calculate the statutory reserves at each future time period should be more conservative than the assumptions used in the PVFP at that point in time. This will be achieved by adding a margin to the key assumptions for the required level of prudence. For example, this could mean assuming a higher rate of mortality in a term assurance basis (give mark for any sensible example).

Prudence

The prudence principle will be met by:

- Reserving for all known liabilities. This includes reserving adequately for the cost of guarantees and any options that may be exercised by the policyholders.
- Choosing assumptions that are realistic but not optimistic — the PVFP on an existing book of business is usually calculated as part of an embedded value calculation and the company will want as realistic an assessment of the value of the company as possible.
- The company will add some margin into each elements of the basis though the margin will be less than that which would be added if the company were performing the statutory valuation.
- Plans for reducing expenses in future would only be taken into account if the reductions are reasonably certain e.g. staff have actually been told they will be made redundant.

Part (i) was bookwork and well answered. The candidates who performed well on part (ii) were those who considered each concept in turn rather than describing the calculation method and mentioning whichever principle they felt to be relevant for each part of the method.

In general some candidates focussed too much on the detail of the calculation method rather than addressing the question asked. A number of candidates discussed the modified statutory basis which was not asked for by the question. The general level of discussion on consistency and going concern was poor, tending not to go beyond consistency from year to year, and between investment assumptions for the former, and expense assumptions for the latter.

- 5** (i) $\text{UWP Reserve} = \max(\text{bonus reserve value}, \min(\text{PRE surrender value}, \text{unadjusted SV}))$

The bonus reserve value (BRV) is the discounted value of future benefits at the valuation rate of interest but allowing for future reversionary bonus consistent with PRE under the valuation assumptions.

The unadjusted SV is the amount that would be paid on surrender disregarding terminal bonus and market value adjustments but allowing for standard surrender penalties.

The PRE surrender value is the amount that would reasonably be expected to be paid on surrender having regard to the representations of the company in the event of a significant level of policy discontinuances.

As the rate of interest increases, the BRV reduces although once the supportable bonus rate exceeds 0, the rate of reduction will reduce since the total assumed unit growth rate will also increase with the valuation rate of interest. However, $\min(\text{PRE SV}, \text{unadjusted SV})$ will not vary with valuation rate of interest.

The BRV is therefore more likely to form the reserve at lower rates of interest. At these interest rates the reserve will reduce as interest rate increases. Once the BRV falls below $\min(\text{PRE SV}, \text{unadjusted SV})$ the reserve will no longer change with any change in interest rate.

- (ii) The comparison of BRV with PRE SV and unadjusted SV is done on a policy by policy basis. The reserve for different policies may therefore be affected in a different way, depending on which part of the above comparison forms the overall reserve.

BRV

If equities fall in value then the yield on these equities will normally increase although the impact of the increase in equity yield will be limited by the maximum reinvestment yield that applies in the UK. Thus, if equities are notionally apportioned to these liabilities, the BRV part of the above formula will reduce. So, for those policies where the BRV forms the reserve, the reserve will reduce.

The reserve will also be affected by the fact that the fall in value will mean that extra assets with a potentially different yield will also have to be allocated to the liability when determining the maximum valuation yield.

PRE SV

The PRE SV is the amount that would be payable in the event of a significant level of policy discontinuances. In these circumstances the company will be

likely to remove or reduce any smoothing of SVs relative to asset shares that is currently being applied through application of a market value adjustment, although it is necessary to ensure that reduction in smoothing is consistent with PPFM.

The PRE SV is therefore likely to reflect unsmoothed asset share. So, assuming that the asset share is partly backed by equities, the PRE SV will reduce on a fall in equities, as will the reserve for those policies where the PRE SV forms the reserve. Assuming that there is a significant % of equities backing the asset shares, the PRE SV will tend to be more sensitive to changes in equity levels than the BRV.

Unadjusted SV

For those policies where the unadjusted SV forms the reserve, there will be no change in reserve when equities fall in value.

When considering the impact on the block of business as a whole we therefore need to consider how likely it is that BRV, PRE SV, or unadjusted SV will form the reserve for these policies:

Valuation Interest Rate < unit growth rate (4% guarantee + supportable bonus):

BRV > unadjusted SV so the latter will not form the reserve for any policies

The extent to which PRE SV exceeds BRV depends on how much of historic investment returns have been distributed in the form of reversionary bonus. The more that has been distributed, the higher the value of units relative to asset share and the more likely it is that the BRV will bite. In general PRE SV is more likely to exceed BRV late in a policies life when a terminal bonus cushion is more likely to have built up. BRV would also be more likely to form the reserve than PRE SV for policies with a long term to run since we would effectively be multiplying the bid value of units by $((1 + \text{guaranteed rate}) / (1 + \text{val interest rate}))^{\text{term to run}}$ when comparing with PRE SV.

Valuation Rate > unit growth rate:

Although BRV < unadjusted SV, it could still form the reserve if PRE SV < unadjusted SV.

At early durations, PRE SV might be less than unadjusted SV since, if it is consistent with PRE, it may be based on the high initial expenses rather than the level charges applicable for this contract. This is because the PRE SV is paid in the event of a significant level of policy discontinuances. In these circumstances, the company could no longer afford to cross-subsidise early leavers from maturities (as it is doing on an ongoing basis with this charging structure). The company would need to be sure that its marketing literature

and other communications allowed such an adjustment in this situation so as to make it consistent with PRE and PPFM.

The factors driving the comparison of BRV and PRE SV are essentially the same as when valuation rate of interest < unit growth rate as discussed above. The one difference is that, all other things being equal BRV would be more likely to form the reserve for policies with a short term to run since we would effectively be multiplying the bid value of units by $((1 + \text{unit growth rate}) / (1 + \text{val interest rate}))^{\text{term to run}}$.

Summary

Thus, the extent to which reserves reduce when equities fall depends on the % of the portfolio that has only been in force a short time, the valuation yield, the average outstanding term of the business, and the extent to which past investment returns have been distributed as bonus. It will also depend on the proportion of the assets backing the policies that are invested in equities.

This question was very poorly answered even though the question concerned a basic contract type. A significant number of candidates made no mention of PRE SV, and only mentioned unit reserves and non-unit reserves. This restricted the number of marks that they could obtain.

Few candidates got the marks which were available for the description of the impact on BRV, PRE SV, and unadjusted SV in the first section of part (ii) – fewer still got many marks for the latter section of part (ii) which was challenging.

6 (i) Mortality

For the deferred annuities the mortality risk will be small if the value of the fund is returned on death. If the return is restricted to a refund of premiums, possibly with interest, there will be a surplus or strain on death, but the amount will still be small.

For the immediate annuities longevity will be a major risk. Annuitants living longer than expected in the premium basis would be a significant source of strain. Future mortality experience for annuitants will depend on medical advances not yet foreseen so is very difficult to estimate.

Investment

The immediate annuities will have been priced on the basis of interest rates available at purchase, and if appropriate matching assets could have been purchased at the time there will not be a significant risk. For annuities with a long duration, such as joint life or escalating annuities, matching assets may not be available.

There will be credit risk if assets other than gilts are used.

For the deferred annuities, the with profits nature of the contract can absorb differences between actual and expected investment return through the bonus structure. However, there is a risk that the guaranteed benefits on retirement are greater than the asset shares at that date e.g. due to past bonus declarations being high relative to current asset share levels.

Since the company appears to have little interest in maximising the return on the assets, the investment return earned for wp policyholders might be poor.

Expenses

For both contracts the risk is that the contract cannot be administered for the margins assumed in the pricing basis. There are a large number of reasons why this might be the case:

- Inefficient administration
- Additional requirements of government or regulators
- Computer systems that need a major upgrade
- Inflation

For the deferred annuity expense strains can be absorbed in the surplus distribution strategy, subject to any restraints due to meeting PRE.

Persistency

Overhead expenses attributable to the sub-fund will have to be shared amongst the number of policies in the fund. Thus the number of policies directly impacts the expense performance. The following will directly affect this:

- The rate at which deferred annuities are transferred or surrendered. It is assumed that the immediate annuities cannot be surrendered.
- The rate at which the option to transfer to another insurer at vesting is exercised.

If lapses pre vesting are higher than expected and surrender values exceed asset share then there will be a strain on the fund.

Other

The business may also be subject to regulatory or compliance risks, depending on the regulatory environment in the territory concerned.

There is always a risk with a sub-fund that the ring-fenced nature will break down for example:

- more capital may be needed to support the fund and might not be available

- the payouts may exceed asset share and the smoothing policy does not allow payouts to reduce quickly enough for payouts to average out at asset share over time
 - the guaranteed benefits may exceed assets in the rest of the business, even with no distribution of surplus, in which case the sub-fund's surplus may be used to the rest of the business.
 - there may be other demands on the fund to cover e.g. mis-selling compensation payments
- (ii) The company will need to decide how to distribute any free assets. In doing this, it will aim to treat different generations of policyholders equitably.

The primary issue affecting the surplus distribution strategy is that the deferred annuities will necessarily cease to exist long before the immediate annuities. This will be the case whatever method is used to distribute surpluses.

At the end, the sub-fund will consist entirely of without profit policies. The key issue will be how much surplus is necessary to be retained in the sub-fund once the with profits policies expire, in order to retain prudence in the valuation basis to limit the risk of the ring fencing breaking down to an acceptable level.

If a low probability of breakdown is chosen, this will increase the free assets needed to manage the annuities in payment, and hence will reduce the bonuses that can be distributed to the with profits annuitants. Alternatively, if the bonuses to the with profits annuitants are maximised, it will be necessary to make it clear to the shareholders and policyholders outside the sub-fund what risk they are taking.

If the bonus distribution method uses a guaranteed and a non-guaranteed element of bonus, the non guaranteed element could be increased at the expense of the guaranteed element. This will assist in managing the increasing uncertainties as the fund runs down. Whether this can be done depends on the expectations given to policyholders in marketing literature, by the company's past actions, or by general practice in the industry. Expectations will also have been set when the sub-fund was acquired.

With a closed with profits fund there is the potential for the tontine effect — the last remaining with profits policyholders receive unjustifiably large distributions of surplus (or there is not enough surplus left to give them a fair distribution). It will be necessary to determine who is entitled to surpluses in the sub-fund once it has no with profits policies. This may need to involve an approach to the regulator or the courts.

An alternative would be to start offering with profits annuities in payment. This will then give a destination for surpluses and also a means of dealing with strains through the bonus system. But introducing a new type of contract

to address this issue will be expensive in contract design and marketing, particularly for a closed and diminishing fund.

Another approach would be to reinsure the annuities in payment, either to the rest of the company outside the sub-fund, or to a reinsurer outside the company altogether. The former retains any scope for profit (and loss) within the company, but gives difficulties in determining a fair “arm’s length” price for the reinsurance. The latter approach has the reverse advantages and disadvantages.

The company will need to decide on what investment strategy is appropriate for a declining fund where outgo exceeds income.

This was a challenging question but the general standard of answers was high. Good candidates identified the key issues, were able to expand on these, and were able to offer potential solutions. Credit was given for sensible answers not covered in the standard solution. Those who did not perform well on this question tended not to address the specifics of the question, or didn’t cover a broad enough range of risks in part (i). Some candidates discussed the risks to the shareholders, rather than the sub-fund.

- 7** (i) On PMA92C20 at 4%, $adue_{70} = 11.562$ and $adue_{71} = 11.136$

Liability at year end 2002 = $500,000 \times 11.562 \times 1.005 = 5,809,905$

Assets at year end 2002 = 5,809,905

Surplus at start of year = zero

Liability at year end 2003 = $530,000 \times 11.136 \times 1.005 = 5,931,590$

Assets at year end 2003 = 6,100,000

Surplus at year end = $6,100,000 - 5,931,590 = 168,410$

Hence surplus arising during 2003 = $168,410 - 0 = 168,410$

- (ii) (a) Investment surplus = actual earned investment income less expected investment income

Actual investment income

= increase in assets less cashflows in (premiums) plus cashflows out (expenses and annuity payments)

= $6,100,000 - 5,809,905 - 575,000 + 3,000 + 17,250$
(= $575,000 \times 0.03$) + $500,000 + 50,000$

$$= 285,345$$

Expected investment income

$$= 0.04 \times \{\text{start year assets plus cashflows in less cashflows out}\}$$

(NB all cashflows occur on 1 January)

$$= 0.04 \times \{5,809,905 + 575,000 - 3,000 - 17,250 - 500,000 - 50,000\}$$

$$= 232,586$$

$$\text{Investment surplus} = 285,345 - 232,586 = 52,759$$

- (b) Expense surplus = expected expenses less actual expenses, accumulated to year end at expected (i.e. valuation) interest rate
- $$= \{0.005 \times 500,000 - 3,000\} \times 1.04$$
- $$= -520$$
- (c) Mortality surplus = expected less actual death strain
- $$= \text{expected less actual year end liability}$$

For existing business:

$$\text{Expected in-force annuity at year end 2003} = 500,000 \times \{1 - q_{70}\}$$

$$\text{Actual in-force annuity at year end 2003} = 530,000 - 50,000 = 480,000$$

$$q_{70} = 0.013605$$

Mortality surplus on existing business

$$= \{(1 - q_{70}) \times 500,000 - 480,000\} \times 1.005 \times 11.136$$

$$= 147,702$$

Mortality surplus on new business

$$= \{(1 - q_{70}) \times 50,000 - 50,000\} \times 1.005 \times 11.136$$

$$= -7,613$$

- (d) Other new business surplus = new business net cashflow accumulated to year end at expected (valuation) rate of interest, less expected year end liability in respect of new business

$$= \{575,000 - 17,250 - 50,000\} \times 1.04 - (1 - q_{70}) \times 50,000 \times 1.005 \times 11.136$$

$$= -23,911$$

Check total	Investment surplus	52,759
	Expense surplus	(520)
	Mortality surplus existing business	147,702
	Mortality surplus new business	(7,613)
	Other new business surplus	<u>(23,911)</u>
	Total surplus	168,417

Agrees total from (i) (may differ slightly allowing for rounding)

- (iii) (a) Since the valuation rate of interest has not changed, we can assume that markets have not moved significantly over the year, so actual investment returns should be roughly in line with the yield on the underlying fixed interest investments. Receiving a positive investment surplus is therefore not surprising.

It includes the release of normal prudence margins in the valuation rate of interest and any returns achieved on higher yielding corporate bonds in excess of the “risk-free” rate.

- (b) A small strain has arisen due to actual expenses exceeding those in the valuation basis. Since the latter should include a margin of prudence, this may be cause for concern.
The company should investigate the reason for the over-run and establish whether it is a one-off or can be rectified, or whether it is likely to continue longer term. If the last of these, the company should revisit both the valuation assumption and the expense assumption used in pricing the annuities.
- (c) A large mortality surplus has arisen from existing business due to there being more deaths than expected, or perhaps due to the death of an annuitant with a relatively large annuity amount.

The tranche is relatively small and therefore more sensitive to random variability. So the company should not expect to continue to receive these surpluses in future. The mortality basis should not be weakened based on this year's results alone but experience should continue to be monitored.

As no deaths were observed within the new business group, a small mortality strain arose. However, there are even fewer annuitants within this group (probably less than 1 expected death) and the same conclusions can be drawn as above.

- (d) A small strain arose on the writing of this new business. This is most likely to be due to the pricing of the annuities being based on a higher yield than the prudent 4% p.a., and hence the liability exceeds the accumulated premium.

Although this was a fairly standard analysis of surplus question, it is always difficult to attempt these in exam conditions. Given this, the quality of solutions was reasonably high. In the numerical parts the quality of the answers deteriorated as the question progressed; nearly all candidates calculated the total surplus correctly, most calculated the investment surplus correctly, but fewer calculated the mortality surplus correctly. When calculating the expense surplus, credit was given to those who included the initial expense surplus within this element, although this would not normally be included here.

In part (iii), marks were given for a valid interpretation to a wrong answer from an earlier part as long as the comments made sense in the context of the financial information available. For example, if a candidate calculated a large investment loss and then said that this implied that market values had fallen then no mark was given since this was not implied by the information available.

END OF REPORT