

EXAMINERS REPORT

April 2007

Subject ST2 — Life Insurance Specialist Technical

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.

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Chairman of the Board of Examiners

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Comments

These are given at the beginning of each question.

- 1** *This question was generally well answered. A number of candidates spent time describing the calculation of asset share, rather than just listing the deductions from asset share as required by the question.*

The cost of any benefits will be deducted. For example this may be the cost of providing life cover to the extent that any payment made is in excess of the asset share itself. These may be taken on a smoothed basis or based on actual costs

Expenses will also act to reduce the asset share. These include internal company expenses (initial/renewal/overheads) and the impact of any commissions payable

The cost of capital set aside in reserves to support the policy may also be deducted

Tax may be deducted from the investment return for some product types

Specific deductions may also be made to cover the actual or expected cost of any guarantees or options embedded in the contract, for example guaranteed maturity values.

There may be deductions to make a contribution to free assets to assist in the smoothing of bonuses or build investment freedom

If the company is proprietary there will also be deductions in respect of profits payable to shareholders.

Miscellaneous losses e.g. on surrender and losses from without profits business

- 2** *Overall this question was not as well answered as it might have been given that it was relatively straightforward. In part (i) a number of candidates showed a poor understanding of actuarial funding. There was a lack of detail in part (ii). In part (iii) some candidates did not understand that the suggested contract was an alternative to actuarial funding rather than one on which actuarial funding could be applied.*

- (i) Actuarial funding allows the life insurance company to hold a lower unit fund value than if actuarial funding were not used by taking advance credit for the higher annual management charges

Actuarial funding takes into account, however, that it is not necessary to hold this fully funded unit value at all points in time, since the unit fund liability is contingent on certain events.

e.g. the full value of the unit fund is only required to be paid out if the policyholder dies during the term of the policy.

Only part of the charge applied to capital units is required to cover future renewal expenses

The remainder is available to create additional capital units to ensure that the full face value is available by maturity.

Hence at any point in time the company can hold a lower unit fund, defined as:

$$UF_t A_{x+t:n-t|}$$

Where UF_t represents the fully funded bid value of units at time t

.....and $A_{x+t:n-t|}$ represents the actuarial funding factor, where the endowment assurance function is calculated on a suitable basis.

... and n is the original term of the contract

The interest rate used in the calculation of the actuarial funding factor is usually the difference between the annual management charge charged on the capital units and the annual management charge charged on the accumulation units, i.e. in this case 4%.

- (ii) The criteria that must be satisfied in order for the company to be able to use actuarial funding is as follows:
- There must be a unit related charge on the unit fund.
 - This is required so that if less than the fully funded value of units is held i.e. fewer units are purchased in the early years.....
 - the unit related charge in excess of that used to meet ongoing expenses will be exactly sufficient to purchase the additional units required in later years.
 - Since the charge is unit related, both the unit fund and the charge will grow at exactly the same rate, the fund growth rate.
 - Practically, the company must have a product design where in the initial years, capital units are purchased that have a higher fund management charge than the fund management charge on the accumulation units bought in later years.
 - Strictly speaking, actuarial funding could be used where there are only accumulation units with an annual management charge of say around 1% if not all of the 1% is needed to cover future renewal expenses, but in practice this is not common.
 - Actuarial funding can be used where the residual charges (from, for example, annual management charges or policy fees) not used to fund additional units are sufficient to cover ongoing maintenance expenses
 - A surrender penalty is needed on the policy if actuarial funding is used.
 - The surrender penalty will dictate the maximum actuarial funding factor that can be used, such that the minimum unit fund held at any time equals the surrender value of the policy.
 - In addition, the surrender penalty must be defined in terms of a percentage of the bid value of units.

- Actuarial funding must be permitted under the appropriate legislation
 - The non unit reserve must be sufficient to cover the death benefit available
- (iii) The advantage of this product design is that the initial charges taken by the company (through the low allocation percentages in the first 2 years) could be set to exactly match the incidence of the high initial expenses suffered by the company in the first 2 years.

e.g. the company could recoup from these charges the high initial costs of setting up the policy, including underwriting, paying initial commission, setting up the non-unit reserves required in the supervisory solvency regulations and so on.

Contract may be more capital efficient for company (e.g. new business strain reduced) — assuming the reduced allocation in the first 2 years is sufficient to repay initial costs.

The new proposed design is generally much simpler than one involving capital units:

- The design is more transparent, thus policyholders are likely to find it easier to understand
 - Any regulatory requirements for easy to understand contract designs and no hidden charges are likely to be met
 - It will also be easy for the sales agents/other sales channels to explain to potential customers.
 - No need for two types of units under the new design and all premiums would be invested in accumulation units with a low annual management charge
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- There will no longer be the need to impose surrender penalties, making it easier for customers to understand and to implement from a system perspective.
 - The additional literature that would have been required to explain the concept of the capital units etc will no longer be required, making marketing and sales literature more streamlined and customer friendly.

However, the main disadvantage of this approach is that, as a result of the product design being very transparent, potential customers may view the initial charges as too high and difficult to justify — and hence they may not find this product attractive.

This is especially true in relation to alternative forms of investment that may be available, such as investment in mutual funds/unit trusts where the allocation rates would be much higher.

Hence customers may in this instance choose to invest in unit trusts directly and purchase the insurance cover separately (e.g. via a term assurance product) rather than suffer these heavy up front fees.

There will now be two different designs of the contract resulting in legacy systems and products that need maintaining.

Systems implications need to be considered — whilst there is now no need for capital units, there is a requirement to include reduced allocation rates for certain periods

The actions of competitors would need to be taken into account — capital units may no longer be offered by other companies.

There is a need to consider the extra costs of developing the new product design — e.g. costs of additional training of staff and additional profit testing required

- 3** *This question was heavily based on bookwork and was generally well answered. In part (ii) candidates concentrated on the splitting up of expenses, and there was relatively little discussion around the conversion of these expenses into expense allowances.*

- (i) List of assumptions required:

Mortality
Initial administration expenses
Ongoing administration expenses
Claim expenses
Investment expenses
Expense inflation
Initial commission
Renewal commission
Clawback of commission
Surrender/Paid Up rates
Investment return
Tax
Reserving requirements
Solvency margin requirements
Rate of re-insurance recovery
Profit criteria e.g. IRR
Or profit margin at specified risk discount rate
Average case size
Volumes of business
Business mix,
e.g. age / sex etc

- (ii) The company would need to agree the period to which expense analysis will relate.

It would want the period to be short enough to ensure homogeneous data but long enough to enable it to have sufficient data such that results are credible.

It would need to gather data subdivided into:

Direct expenses: Expenses that depend on volume of NB or level of in force

Overheads: Balance of expenses e.g. those that relate to general management and service departments not directly involved in NB or policy servicing

In addition the company would want to split expenses into initial, renewal, termination and investment expenses

The company would also want to split expenses between single and regular premium policies

The company would also want to split expenses into those that are per policy, per premium or per sum assured

Commission would be excluded from the investigation and allowed for as paid

The main costs are likely to be Salary and Salary related

Such expenses would be split by department/function.

The company would need to identify those departments that are directly involved in servicing policies, and those that are overheads

Those departments that are obviously linked to non linked whole life can be allocated to that product line

Those obviously linked to other product lines can be ignored

It would need to split time by process undertaken e.g. policy servicing, policy set up or claim settlement

Where a function works on a variety of processes/products then the expenses can be split using a timesheet analysis

Those departments that are identified as pure overheads (e.g. HR, Legal, Accounting, Actuarial Valuation) can be split pragmatically across other Departments e.g. HR could be split in proportion to number of staff in each direct area.

Underwriting costs

There may be costs relating to the company's underwriting process, for example the cost of doctors reports or medical examinations
These would be directly allocated to new business

Property Costs

Property costs that relate to buildings occupied by the life company can be split by using notional rents and then allocating by floor space occupied by departments, and then expenses allocated as per salaries above

Computer Costs

Allocate to departments by computer usage

Costs of purchasing new computers could be amortised over useful lifetime and then added to ongoing computer costs

Investment Costs

Directly allocated to investment expenses
Split directly by product line based on funds under management

One off capital costs

Any relevant costs would be amortised over expected useful lifetime and treated as part of overheads and spread by department
Exceptional Items that are unlikely to recur will be excluded from the analysis

Expenses would need to be inflated from the period of investigation to the period for which they will be used

They may also be adjusted for any known changes in expense levels, e.g. benefits from recent cost saving programmes

These would then need to be converted into allowances per policy using:

- Number of new policies for new business expenses
- Average number of policies in force over analysis period (for renewal expenses) Average number of claims over analysis period (for termination expenses)
- Investment expenses are likely to be expressed as a percentage of funds under management so that they can be treated as a deduction from earned investment return.

The company would then want to compare its resulting assumptions to those derived from previous exercises and ensure that it understands any significant variations

The company may then want to include prudent margins within the allowances

4 *Whilst part (i) was generally well answered, many candidates only discussed the merits of convertible term assurance rather than discuss why other products may not be appropriate. In part (ii) a significant number of candidates did not demonstrate an understanding of the relative costs of the different options; those that did understand this tended to perform better. A lack of detail within the answers to part (iii) tended to cause candidates to score poorly on this.*

- (i) At this point in their life, their main need would be to provide for the financial needs of the family in the event of the death of one or other of the parents.

Primarily, it is the death of the salary earner that would cause the greatest financial hardship to the family.

Given that they have just moved into their first house and have young children, their disposable income is likely to be low.

This means that investment products are unlikely to be their highest priority.

This means that an endowment assurance or whole of life assurance are likely to be an unnecessary expense for them at present.

The same could be said for pensions, although the salary earner may be part of a company pension arrangement.

A term assurance is, therefore, likely to provide the financial protection that they need at a cost they are likely to be able to afford.

A decreasing term assurance may be appropriate if they are only concerned with repaying any loan/mortgage they have taken out to buy the house.

However, a level term assurance is more likely to be required to enable the surviving parent to be financially secure, even after the loan has been repaid.

One of the risks that the couple will take is the risk of inflation.

The benefit payable by the policy may not be sufficient at the time it is paid due to the effects of inflation.

The convertible term assurance gives the couple an option to effect a further policy without underwriting at the end of the original term assurance.

This would enable them to effect a larger policy in the future, hence mitigating the inflation risk, when their disposable income may be greater, irrespective of their state of health.

The convertible term assurance is flexible if the needs of the couple change in future.

Alternatively, they could effect a with profits endowment or whole of life. The benefits from these policies would increase as bonuses are declared, giving some protection against inflation.

(ii) Joint Life First Death

Joint Life First Death provides the most cover and meets the needs of the couple.

This provides benefit to help fill the need if the salary earner dies.

But also provides benefit to help pay for childcare should the other parent die.

However, for a given level of benefit this is the most expensive option.

Single Life

They may choose to compromise and select the single life option on the life of the salary earner.

Or they may select a lower benefit and the joint life first death option.

This will depend on their circumstances (for example, if their parents live near by, they might be prepared to help with childcare).

Also, the decision may be affected by whether the salary earner is part of a group life cover arrangement provided by the employer.

Joint Life Last Survivor

The low cost option would be joint life payable on the second death.

Whilst the size of the premium might be crucial, this basis for the life cover is unlikely to meet the family's financial needs if the salary earner was the first to die.

Although, this might be deemed acceptable if the other parent expects to return to work in the very near future.

(iii) Mortality

The major risk is that the experienced level of mortality of the lives covered by this contract is significantly worse than assumed when pricing the product.

This could be exacerbated if the mortality of those with abnormally large sums assured was worse.

There is a risk that the loading for the convertibility option is insufficient to meet the cost of the option.

There is scope for anti-selection by the policyholder both at the start of the policy and at the time of conversion.

The two main ways to mitigate these risks are underwriting and reinsurance.

Underwriting ensures that the health of potential customers is, across the portfolio, in line with that assumed in the pricing. Underwriting would need to take into consideration mortality after the conversion date, so over a longer period than the original term.

Reinsurance would protect the company from general mortality risks. Either by reinsuring all lives to some extent or by reinsuring the large cases.

The pricing for conversion options is difficult; advice from the reinsurance company should be sought.

Reinsurance introduces a further risk, that the reinsurer defaults, which can be mitigated by carrying out due diligence on the credit rating and financial standing of the reinsurer, or by using more than one reinsurer.

The risks associated with the conversion option can be further mitigated by limiting the conversion options to specific events or to specific times

Expenses

There is a risk that future levels of expenses (renewal and termination) and expense inflation may be higher than assumed in the pricing.

Levels of commission and initial costs should be reasonably predictable, if sales volumes are in line with plan.

Rigorous cost control should be pursued and monitored regularly.

Action should be taken as soon as they move significantly from the assumed level.

Withdrawal

The company is at risk from early withdrawal, as premiums are unlikely to have covered the initial costs, and from selective withdrawals.

A prudent allowance for withdrawals should be assumed in the pricing. The key to this is to ensure that the product is appropriate for the customers and is affordable.

The sales process should be checked to ensure that these issues are addressed, and commission clawback processes can be introduced to encourage intermediaries to check affordability and need of product at outset.

Withdrawal experience should be monitored and re-price if significantly worse than assumed.

When introducing new rates, there is always the risk of lapse and re-entry if rates are cut.

In practice there is not much that can be done. If it is expected to be significant, then any expected loss arising from the lapsing policies would need to be offset potential profit from sales in the decision process.

Mix of business

If the mix of business is significantly different from the model points used to profit test the rates, then any cross-subsidies between rates for different ages and terms will lead to a different level of profit.

Volume of Business

Too much business leads to excessive new business strain and capital problems or admin capacity issues.

Need to carefully monitor actual volumes against plan to ensure remain within acceptable limits.

Too little new business could mean that the Company doesn't recoup development costs.

Need to carry out market research pre-launch to ensure that appropriate demand exists.

In general, the risk of profit being less than target could be reduced by increasing any margins in the premiums charged .

Other general risks e.g. regulatory, tax, competition

5 *This question was not as well answered as expected by the examiners. In many cases candidates described all risks of writing annuities, rather than concentrating on the additional risks of writing annuities in a new territory. Many candidates failed to mention the requirement to understand the market and competition. Answers were often highlighting an issue without demonstrating a real understanding of the difficulties the insurer would face.*

(i) Legal/Regulatory

- The insurer may have lack of knowledge of local legal framework or a lack of knowledge of life insurance regulations
- The insurer would need to consider potential taxation issues (e.g. withholding tax)
- It would also need to consider possible capital requirements — it may be required to hold resources in local currency/assets
- It would need to consider different political risks — e.g. government may have monopoly and discourage new entrants

Data

- The insurer will not have any data initially on which to base current assumptions,
- It will need to ensure sufficient data collected when contracts written
- There may be legal barriers to asking for certain data

Mortality/Longevity

- There may be a lack of data on past local mortality experience or a lack of data on which to adequately reflect future mortality improvement trends
- There might be different types of mortality risk or more volatile mortality than in the current territory
- The level of medical advancements within territory will impact longevity

Expenses

- The company is exposed to local inflation (assuming staff are employed in local branch); these may be higher than “normal” (e.g. due to higher admin costs)
- There may need to set up new distribution arrangements which may be expensive
- There may be limited pool of skilled employees may lead to employer having to “buy” people in at higher salaries
- Given the limited knowledge of the territory, estimates of development costs and new business volumes may be less certain, increasing the risk that development costs are not recouped

Systems

- There may be a lack of system infrastructure
- The company will need to consider whether its current administration systems cope

Competition/Market

- There may be a lack of knowledge of local market — who are competitors - and no brand currently in territory
- There may be insufficient demand for this product. For example, is the state benefit/pension adequate such that market for annuities doesn't exist
- The company will need to consider how competitive the market is and consumer attitude to foreign companies

New Business

- The company will need to assess mix/size of new business ; there is a risk that it does not do this accurately given its lack of experience in the market
- It will also need to understand distribution systems in new territory

Investment

- The company may require capital resources within territory which may be of relatively low credit rating or of limited availability
- There may be a currency risk arising from mismatching of assets and liabilities or a currency risk on repatriation of profits to parent company
- There may not be suitable assets in territory to back liability e.g. insufficient fixed interest stocks of suitable term

Fraud

- It may not be possible to verify that annuitants are alive

Other

- reinsurance may not be available or very expensive; or it may only be available from low credit rated reinsurers
- The company may not be able to find suitably experienced staff & management
- There may be practical issues and risks around language and time differences.

(ii) Market/Competition

There is a need to ensure that market research is conducted to gather suitable information on the local regulations and market.

This could be done by gathering information from the local market using publicly available info, regulatory returns, reinsurers, or auditors/consultants/local experts

There is a need to ensure that the brand and company are suitably promoted prior to launch in the territory, and that product design is suitably innovative

Data

Data regarding mortality and trends may be more difficult.

Reinsurers should be able to assist, although regulatory returns may detail reserving and/or pricing bases

Assumptions

In pricing the product the company needs to build in prudent margins for all assumptions notably mortality improvements and expense inflation

The company will want to project cashflows from the business using various scenarios to indicate the sensitivity of the profit to key assumptions.

Mortality

The company could mitigate mortality risk by writing other products in the territory for which profits would increase if people lived longer (e.g. term assurance)

It may make use of reinsurance if available. This would limit risk to insurer initially

It could spread across more than one reinsurer or use highly rated reinsurer

It will need to regularly review experience of this branch to assess if mortality experience is as assumed

Expenses

It should maintain a strict budget and monitor expenses closely against this.

It could hedge expense inflation using local index linked bonds if available

Systems

The administration systems would probably use the main administration systems of the home country — thus avoiding excessive expense of new systems, and also benefiting from all controls already built in.

Investments

To avoid currency mismatch there is a need to invest in assets that match the currency (as well as the term) of the liabilities.

To reduce currency risk in repatriation of profits it could use derivatives

New Business

It will want to build in various new business scenarios, including different volumes and mixes of business

It could use local intermediaries or set up a partnership with an existing company in that territory (e.g. for distribution)

It may require a higher return on capital or charge higher premiums to manage risks

It should monitor sales regularly and act quickly on any noticeable trends

Other

It needs to build in processes to verify annuitants are still alive

If risks were deemed unacceptable by the company then it could decide not to proceed with the project.

- 6** *This was felt to be the hardest question in the paper and was relatively poorly answered. There was a lack of detail in candidates' solutions in part (i), especially in explaining the impact of a movement in yields on particular assets and the expected impact on liabilities. In addition many candidates included reasons in part (i) that were not investment strategy related (e.g. bonus declarations, new business volumes, expenses, regulatory changes). In part (ii) many candidates failed to separate out the short and long term options, which was asked for in the question.*

- (i) Factors that may have contributed to the fall in the free asset ratio include:

The life insurance company may have been holding a mismatched investment position, where the assets held by the company did not match the liabilities of the company, either by nature, term/duration and/or currency. As a result of this the company may have had to increase reserves by holding a significant mismatch reserve

The impact of this would be that the value of the assets of the life insurance company and the value of the liabilities of the life insurance company do not change in the same way (either in direction or in magnitude) as a result of, say a fall in value of a particular asset class.

For example, the company may have been holding a proportion of its assets denominated in overseas currencies (e.g. by investing in overseas bonds or overseas equities), which may have fallen in value, whilst the liabilities that these assets were backing may have been denominated in a different currency and hence, the value of the liabilities may not have fallen.

The fixed interest assets held may have had a shorter duration than the liabilities. If the yields on fixed interest assets fell, this would mean that the liabilities would increase by more than the assets (or vice versa)

If the yields on fixed interest assets decreased in the last three years, this is likely to have led to a reduction in the valuation rate used to value the guaranteed liabilities of the life insurance company. This would increase the liabilities.

So, even if the assets increased by the same amount, the free asset ratio would reduce

If valuation yield is based on yield of equities then there may have been a reduction in this yield, causing liabilities to increase and reducing the ratio

This reduction in valuation yield may have been caused by a fall in dividends or earnings, in which case asset values would be unaffected and there would be no change to the top line in the ratio and the ratio would fall. It may have been caused by a rise in equity values without a corresponding increase in dividends and earnings, in which case the ratio would be less likely to fall

The company may not have been holding a sufficiently high proportion of fixed interest assets to meet all of the guaranteed benefits for with profits business.

For example, the company may have been holding a large proportion of its assets (including any free assets) in real assets such as equities.

Equities have volatile values and may have fallen in value in the last few years, whilst the value of the liabilities that the equities are backing may not have fallen.

This is because, although the running yield on equities would have increased thereby reducing the liabilities, the impact on liabilities may have been less than the fall in asset values

The company may have been taking deliberate action to improve its asset-liability matching and may have been gradually switching more of its assets into fixed interest type assets as opposed to those offering real returns. This may have resulted in the company making lower investment returns which are insufficient to cover new business strain

The company may have been holding assets that were not admissible under supervisory solvency calculations, and the relative value of these may have risen resulting in a fall in the free asset ratio

The company may be subject to regulatory requirements that limit the value of certain assets e.g. to book value, rather than full market value

The company may have just experienced poor investment performance on its free assets possibly including a high number of defaults on corporate bonds, and falls in the value of properties held

- (ii) There are several courses of action that the company could take to improve its free asset ratio further — both in the short term and long term.

Shorter Term

The company could improve its free asset ratio by reviewing the assumptions used in the valuation basis.

Overall the assumptions may be too prudent/cautious and it may be possible to weaken the valuation basis to improve the free asset ratio.

The actuarial team would consider the recent experience of the company with regards to mortality, morbidity, lapses and expenses etc., to determine whether a weakening of the valuation basis can be justified.

They would also need to consider the expectations of the regulator and the with profits policyholders, with regards to changes in the valuation basis and

the need for continuity from one valuation to the next without arbitrary changes.

The company could also improve its free asset ratio by taking actions such as cutting back on capital investment in new projects (e.g. new product development) or in reviewing the efficiency of particular distribution channels.

Investment in the less profitable channels could be reduced or in the extreme particular distribution channels could be discontinued (this should also be beneficial in the long term)

One of the simplest ways to enhance the free asset ratio of the company would be to either require the existing shareholders to inject capital into the company or to raise capital through securitisation or selling off blocks of business. Alternatively, the company could consider using financial reinsurance to reduce regulatory liabilities without having to make a corresponding reduction in the assets. However, raising capital just to enhance the free asset position, is unlikely to be viewed well by the market.

The company should ensure the level of assets that are not allowed for regulatory purposes (inadmissible assets) is kept to a minimum

The company could change its asset mix so that it invests in assets that increase the valuation yield

The company could move to a position that better matched assets and liabilities if this reduced any mis-matching reserve that is required to be held

Longer Term

If the company is currently not holding a well matched asset liability position, and it is thought that this has led to the erosion of the free asset ratio in the last three years, then the actuarial team could investigate the impact of moving to a more matched asset liability position and whether this would improve the free asset ratio. This will reduce the risk of a further erosion due to any mismatch

They would need to consider:

- The asset allocation required given the nature/term/currency of the liabilities.
- Whether a forced reallocation over a short period of time could result in the sale of equities at a time when equity values are thought to be low resulting in realised capital losses, hence the practical timing of when the move to the new asset allocation can be achieved would need to be taken into account.
- There may also be tax implications that the company would need to consider.

- The implications of switching to a more matched position, from a regulatory perspective.

The company may actually be holding too high a proportion of its assets in fixed interest type securities, and hence the company may not be sufficiently exposed to real assets offering a better rate of investment return in the long run.

Hence moving assets into asset classes offering greater levels of investment return may result in an improved free asset ratio over time.

This is especially true if the free assets of the company are being held in too conservative an asset class (e.g. could move to a less well matched position)

Similarly, the company may need to review its investment guidelines, since previous guidelines may have prevented investment in certain asset classes, such as property, which may actually offer good potential for long term investment returns.

Switching into such asset classes may lead to better investment returns and improvements in the free asset position in the long run, although care would have to be taken to ensure compliance with local investment regulations.

The company could also improve its free asset ratio by finding other ways to reduce expenses — this may be, for example, introducing more IT to improve the efficiency of operational processes, introducing a cost cutting programme to identify obsolete roles resulting in redundancies or identifying areas where costs can be saved e.g. property costs.

Reducing expected future expenses could have an immediate benefit through a reduction in expense reserves

In the longer term the company may be able to improve its free asset ratio by introducing new more profitable lines of business or reduce new business in less capital intensive products

An overall reduction in new business, or closure to new business, will improve the free asset ratio in the longer term

The company could consider reducing bonuses, or deferring bonuses, where appropriate, and where in line with treating customers fairly.

END OF EXAMINERS' REPORT