EXAMINATION

September 2007

Subject SA2 — Life Insurance Specialist Applications

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

Comments on individual questions are given in the solutions that follow.

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(i) **Realistic Assets**

This is the sum of:

- Admissible assets available for with profits business.
  - This is defined as the regulatory value of total assets in the with profits fund minus the statutory reserves for the term assurance business.
  - The assets should generally be valued at market value.
- Excess inadmissible assets.
  - This is the market value of assets in excess of market risk and counterparty exposure limits.
- The present value of future profits on the term assurance business.
  - Calculated on a market consistent basis, and includes release of LTICR and RCR if these have been deducted from the admissible with profits assets above.

Realistic Liabilities

This is the sum of:

- With profits benefit reserve.
  - May use a retrospective (aggregate asset shares) or prospective method.
  - Must be consistent with the firm's PPFM (or the equivalent in country Z) and reflect the firm's policy on miscellaneous surplus and any other enhancements/deductions made in the past.
  - If a prospective method is used, it must at least take account of all guaranteed benefits and the need to meet TCF, and the projection period must be long enough to capture all "material cashflows" arising from the contracts being valued.

- Future policy related liabilities, which includes:
  - Cost of maturity and any other guarantees on the with profits business.
  - Cost of the guaranteed annuity options.
  - Cost of smoothing.
  - Cost of planned enhancements, i.e. the additional 5% uplift on maturity benefits.
  - Cost of any non-contractual commitments such as mortgage endowment promises.

  The above should all be calculated on a market consistent basis. The preferred method of valuation is stochastically, but market cost of hedging or deterministic projection with probabilities can also be used if justifiable. Assumptions other than economic would probably be set at best estimate.

  The projections would include allowance for management actions, such as dynamic bonus rates or investment switching. These management actions must be consistent with PPFM (or equivalent) and TCF.

The liabilities would also include other long-term insurance liabilities, e.g. tax, mis-selling compensation, the value of future shareholder transfers, and realistic current liabilities.

Risk Capital Margin

This is the additional capital required to cover the impact of a series of prescribed stress tests:

- Fall or rise in equity values of between 10% and 20%, depending on the average level of the FTSE All Share Index (or equivalent index in this country) over the previous 90 days relative to its current level.
- Fall or rise in property values of 12.5%.
- Fall or rise in fixed interest yields of 17.5%.
- Increase or decrease of 32.5% in assumed lapse rates.
- Widening in credit spreads in accordance with a formula linked to current spreads and credit rating.

Working Capital

This is defined as realistic assets less realistic liabilities before allowing for the Risk Capital Margin. The balance sheet also shows realistic excess capital, which is defined as realistic assets less realistic liabilities after allowance for the Risk Capital Margin.

This question part was well answered by those candidates who had learned and understood the Core Reading, and who were able to apply it to the specifics of this particular company. Areas where candidates showed lack of understanding included:

- *The method by which allowance is made for future profits on the term assurance business.*
- *How the without profits statutory reserves impact the realistic assets.*
- *The difference between "costs" and "charges".*
- *The nature of guarantees within with profits funds (many candidates mentioned only the guaranteed annuity options).*
- *Inclusion of a liability for "cost of capital".*
- *The type of fund to which the realistic balance sheet is applicable (i.e. with profits fund only).*

(ii) (a) **Charges for guarantees**

Realistic assets are unchanged.

With profits benefit reserves are unchanged if retrospective (if prospective then they would reduce). The present value of future guarantee charges on existing with profits business can then be included as a new "liability". This will be a negative "liability", i.e. will reduce total realistic liabilities.

If the guarantee charges are to be deducted regularly (e.g. annually) from asset shares then there will be a secondary impact on future policy liabilities (e.g. cost of maturity guarantees) due to lower projected asset shares. This will be similar to the potential impacts outlined under (e) below.

Overall working capital increases.

The RCM calculation can also allow for this additional negative liability in the stressed scenario. It may also allow for increases to the guarantee charges under stressed conditions if the charges have been defined in this way.

Note that the company would have to consider the TCF implications arising from the introduction of guarantee charges.

(b) **Purchase of interest rate derivatives**

Overall there will be no change to realistic assets, because they will reduce by the amount of cash used to purchase the derivatives and increase by the market value of the derivatives. There may be a small reduction due to dealing costs.

Realistic liabilities will be unchanged, as will working capital.

The RCM calculation can allow for the increased market value of the derivatives under stressed interest rate conditions. There may be a small offset from widening of any credit spread in the RCM scenario, but overall it is likely to reduce the RCM (assuming the derivative moves broadly in line with the GAOs).

(c) **Reinsurance of mortality risks**

Reinsurance on immediate annuities has no impact on the realistic balance sheet as these policies are not written in the with profits fund.

Reinsurance of mortality risk on term assurance business will probably reduce the present value of future profits on this business, due to profits ceded to the reinsurer. This may be offset to some extent if it is possible to reduce the mortality rate assumption given the reduction in risk. However, overall realistic assets are likely to be reduced.

Realistic liabilities will be unchanged, since there has been no change to the with profits business, therefore overall working capital is likely to reduce.

The RCM does not include a mortality stress and so will be basically unchanged.

(d) **Switching out of corporate bonds**

Sale and purchase will be done at market price so there should be no material change to the overall value of realistic assets. However, it is likely that dealing costs will be incurred so total assets will reduce. The extent of the

impact depends on the relative size of the corporate bond portfolio. Note that it will not be impacted by any corporate bonds backing immediate annuities, since these are not written in the With Profits Fund.

Since the market consistent valuation approach does not capitalise yields in excess of risk-free rates, a move away from higher yielding bonds has no direct impact on realistic liabilities.

The duration of the bonds is unchanged and so the underlying volatilities should also be broadly unchanged. However, the removal of credit risk might reduce the overall volatility of these assets. This would reduce realistic liabilities.

Therefore overall working capital could be broadly unchanged.

However the RCM will be lower, since it will no longer include the credit spread widening stress capital.

(e) **Outsourcing administration**

Higher future expenses will reduce the present value of future profits on term assurance business. Other assets are unaffected and hence overall the realistic value of assets will reduce.

It is assumed that ABC would reflect the new expenses in its asset share calculations. With profits benefit reserves would therefore be unchanged, however future projected expenses would be higher than at present, meaning that projected asset shares will be lower.

Therefore the cost of future planned enhancements will be reduced (5% of a smaller amount at maturity). But the cost of guarantees will be increased because it is now more likely that the guarantees will bite. The cost of smoothing should be broadly unchanged as smoothing should be neutral over time. However, there may be a secondary impact if the cost of smoothing includes a current glidepath and the lower asset shares mean that it takes longer or shorter to achieve the target level. The cost of guaranteed annuity options will reduce, because the guarantee will now be applicable to a lower fund at maturity.

Overall the impact on working capital depends on the relative size of each of the above components.

RCM will be broadly unchanged, since it does not include an expense stress.

(f) **Operational risk management system**

There may be some initial set-up costs which would reduce realistic assets to the extent to which they are deemed chargeable to with profits policyholders.

The system may also result in an expectation of higher future ongoing expenses being incurred, e.g. a new operational risk team. If this is the case and these are deemed to be chargeable to with profits policyholders then the impact would be as for (e).

Otherwise there would be no impact on the realistic balance sheet, since operational risk is not part of the capital assessment under Pillar 1.

This question appeared to differentiate well between students who had simply learned the bookwork and those who had spent some time understanding it. Some candidates erroneously assumed that all actions must improve realistic surplus. The question only asks for impacts immediately after the actions have taken place, so marks were not awarded for what is expected to happen in future balance sheets. In particular, many candidates stated incorrectly that the retrospective with profit benefits reserve (asset share) would reduce if guarantee charges were introduced or expenses increased.

Very few candidates realised that the interest rate derivatives would not change the market consistent value of the liabilities. Some candidates failed to note that the annuity business does not impact the realistic balance sheet, since it is written outside the with profits fund. Very few candidates appreciated that the statutory reserves for the without profits business are held as a deduction to realistic assets, and so assumed that the realistic liabilities would change with reinsurance.

The question explicitly asks for the impact on the "components of" the balance sheet, and not just on the overall surplus; candidates who considered in turn each component from part (i) generally gained higher marks.

(iii) **Advantages**

Not all risks are included in the RCM assessment within the "twin peaks" framework (e.g. expenses, mortality, operational risks). The ICA covers a wider range of risk areas.

Unlike the RCM, the stress tests in the ICA are not prescribed and should be selected as being most appropriate to the specifics of a particular company. It can therefore be considered to be more flexible and relevant. For example, not all companies have the same exposures to market risk: some may have very high equity exposure and so should arguably hold more capital against extreme equity events than suggested by the RCM. The ICA approach is therefore more equitable between companies.

The realistic balance sheet calculation applies only to certain with profits funds. The ICA extends the concept of capital requirement assessment to without profit funds and companies. Overall the ICA therefore gives a more comprehensive and relevant assessment of capital requirements than the existing realistic balance sheet regime.

The calculation can help companies to raise the profile of risk management processes internally and embed risk management into their business at all levels. It should also improve protection for policyholders. If the calculation can be disclosed to investment analysts, the information might help to support share prices.

The calculations can be integrated into other parts of the operation, e.g. product design and pricing, calculations of shareholder value (allowance for frictional cost of capital).

The ICA calculation is an existing framework that has already been implemented in another country, so there is no need for country Z to spend time and money developing its own. The regulator can also liaise with the UK regulator to benefit from their experiences.

Disadvantages

The framework is relatively new in the UK and practices are still emerging, so it might be more useful to wait a few years before adopting the same approach.

The lack of prescription and rules means that a wide range of different approaches might be taken, and it could take some time before the standard of calculation is consistent across all companies.

The company might prefer to wait until the introduction of Solvency II, which might result in changes to the UK regulatory regime.

Some components of the ICA calculation are difficult due to lack of credible data and are therefore subjective. This is particularly the case for the assessment of operational risks.

ICA calculations are confidential, so companies in country Z would not be able to look at UK companies' results for peer comparison.

The calculations would require additional resource and time for the insurance companies to complete. Systems changes might be required, particularly for the inclusion of risks, funds and companies not already covered by the realistic balance sheet calculations. Overall, this would increase costs to the company, which could be passed onto consumers in the form of increased product charges.

Companies might find that they are "insolvent" on an ICA basis, or have materially less spare capital, requiring them to raise additional capital.

The proposal would also place a significant burden on the regulator of country Z, which would need to review all ICAs and issue Individual Capital Guidance (ICG) to each company. If introduced for all companies at the same date, there may therefore be a considerable delay between submission of ICAs and receipt of ICGs. The additional costs incurred by the regulator could be

passed onto consumers in the form of increased taxes. There might also be a burden on companies' management in having to deal with the regulators to discuss the ICG allocations.

The regulator might find it helpful to have a consultation period before implementing any change.

Some candidates interpreted this question as "Describe how an ICA is calculated" and did not address the question that had actually been asked: effectively, is the suggestion to introduce an ICA a good idea or not? Similarly, detailed description of how different types of risk could be assessed was not a good use of time. Discussion of decisions that would have to be made regarding the form of the ICA was also not relevant, given that the question indicates that the Assessment will be identical to that in the UK.

Many candidates who answered the question as written did cover a reasonable range of points, including both technical and practical considerations.

(iv) **Charges for guarantees**

As described in (ii), this would reduce the realistic reserves for the with profits business.

The ICA might also reduce if it is possible to increase the level of charges in adverse conditions. However, the capacity to take guarantee charges could be limited in the extreme scenarios that ICA considers (e.g. if the charges are taken as a percentage of asset share). TCF principles and the PPFM (or equivalent) might also place limits on the company's actions. Similarly the guarantee charge is of no benefit if the guarantee exceeds the asset share in extreme conditions.

Overall it is likely that the capital required would be reduced, reflecting the company's ability to recover some of the costs of guarantees. The reduction in total capital required might be similar to that in part (ii).

(b) **Purchase of interest rate derivatives**

The interest rate derivatives would payoff in the extreme low yield scenarios in which the guaranteed annuity options bite, therefore the ICA and total capital required would be reduced. This might be offset to some extent by the additional risk arising from potential default of the derivative provider.

(c) **Reinsurance of mortality risks**

Unlike for the realistic balance sheet, reinsurance of the annuity business now has a direct impact since the ICA calculation covers all funds of the company, not just the With Profits Fund.

Realistic reserves for both types of without profits business (term assurances and annuities) would increase following reinsurance, as the present value of future profits would likely reduce due to the costs of reinsurance.

The ICA would also need to allow for the additional credit risk, i.e. the risk of reinsurer default. Together with the change in realistic reserves, this would increase the total capital required.

However the allowance within the ICA for mortality risk would be reduced, both for the term assurances and annuities. This is likely to be more significant than the increases noted above, and so overall the total capital required would be expected to reduce. Note however that any benefits of diversification between these different types of mortality risk would also be reduced if reinsurance was purchased.

(d) **Switching out of corporate bonds**

The allowance for credit risk on corporate bonds would no longer be required, therefore the ICA and total capital required would reduce.

Note that, unlike for the realistic balance sheet, the impact would also include the credit risk capital reduction in respect of any corporate bonds backing annuity business.

(e) **Outsourcing administration**

Realistic reserves for without profits business will increase due to higher future expenses.

The allowance for expense risk within the ICA (the risk of admin expenses increasing faster than anticipated) is reduced due to the guarantees in the outsourcing contract. There is additional risk due to reliance on a third party (e.g. fraud, default). Overall however, the ICA and total capital required would be expected to reduce.

(f) **Operational risk management system**

Impact on realistic reserves could be as for (e) if future expenses are higher in order to maintain the system.

The formal risk register will assist considerably with assessment of the operational risk element of the ICA, both in terms of frequency and severity of these risks. This may result in more "accurate" assessments being possible, thus potentially releasing margins from the estimate. However, it should be noted that there is a lack of available data on historic events on which to base these assessments.

The existence of the risk mitigation committee may mean that estimates of potential severity can be reduced, on the basis that mitigating actions and risk controls will be put in place. This action should therefore reduce the

operational risk component of the ICA and thus result in a lower ICA and lower total capital required.

However, it could be the case that the more accurate assessment identifies risks that had not previously been recognised, and/or increases the estimate of other risks now that they are better understood. So the ICA might in fact increase.

It could also be noted that the ICG might well be lower as a result of this action, since the regulator should have more confidence in the company's risk management processes.

Like part (ii), this was a good differentiator between candidates. Some candidates only considered the additional risks that are included in ICA (relative to the RCM) and didn't consider the impact of the proposed actions on the market risk measures. Some candidates considered only counterparty and operational risks, and did not cover insurance risks. Some erroneously compared Pillar 1 and Pillar 2 capital requirements, rather than Pillar 2 capital requirements before and after the specified management actions as required by the question. Some stated that they were only going to consider ICA in this part, since realistic reserves had already been covered in part (ii), apparently not realising that part (iv) now also covers realistic reserves for without profits business (for which the impact can differ).

2 (i)

Persistency

The value of in force business (usually the most significant part of the embedded value) represents the present value of future income less costs from the in business in force. The income is entirely dependent on the policies remaining in force so is directly impacted by persistency.

Persistency also impacts per policy expense assumptions; if off rates are higher than expected then fixed costs will have a proportionately greater impact.

Persistency is likely to give rise to the most significant variances. In addition persistency can vary significantly over time, e.g. as economic conditions fluctuate, so can give a material difference in particular years.

The presence of a surrender penalty in the first five years does give some protection against adverse experience but is unlikely to compensate for the loss of expected future revenues. It is also possible that significant surrenders occur at the end of the penalty period, and this may have been mis-estimated.

Expenses

Assumptions will have been made about the cost of administering the in force business. These may vary over time as servicing effort fluctuates with trends in client

contact, e.g. due to bad publicity or investment performance. Alternatively they may have been set aspirationally so actual costs may not be in line with assumptions. Or inflation (e.g. increases in staff salaries) might have been very different from expected.

Given the high average case size it is unlikely the cost of policy administration will give rise to a significant variance.

In addition development costs may be attributable to the experience variance. These may be quite volatile if particular projects related to the management of this product line are carried out in particular years. This may therefore give a more significant variance. There may also be other exceptional expenses that cause a variance, for example due to regulatory changes.

Investment return

If investment returns are different from expected the level of income from the annual management charge will vary. This will include the impact of any currency movements on overseas investments.

Variances will depend on the volatility of the returns on the assets held so will depend on the asset mix of the unit linked funds backing the product. Variances could be significant, particularly if funds are equity based and there are large rises and falls in stock markets.

Investment return may itself be impacted by variances in tax payments, for example due to changes in tax rates or tax regulations.

Mortality

Variances in mortality rates may cause small changes in emerging profits as there is a small strain on death, and death rates will also impact the receipt of future profits. However, given that this is only 1% of the unit value the impact is likely to be very small.

Although most candidates were able to identify the relevant assumptions and to explain how they impact the embedded value calculation, relatively few included observations on how volatile the different types of actual experience might be year on year – which is a key contributor to experience variation. Some candidates wasted time explaining other elements of an embedded value analysis.

(ii)

The experience assumptions used for future embedded value reporting should be a realistic estimate of future experience. The company would need to consider whether the experience in the last year was likely to be representative of future experience.

In determining this, the company would want to consider the length of time over which the experience been worse than the assumptions. If there has been a sustained

period of worsened experience this would give a stronger case for changing assumptions that if this was a one off.

The company would want to ensure it was happy the data in the analysis was sufficient such that the result was credible. It would also want to consider how statistically significant the result was. If it was felt to be a random variance not an indication the underlying experience had worsened it may not want the change the assumption.

In addition the company would want to look at a trend in experience over time before making a decision.

There may also have been events that may have caused an impact on the experience over this period that may not be repeated, for example poor stock market performance, customer service issues, poor media coverage of the company or industry.

The company could consider whether the experience is the result of a large tranche of business reaching its fifth policy anniversary and thus leaving the surrender penalty period. It should investigate persistency by in-force duration.

The company would also need to consider the comparability of business over time. It is possible that business written in different time periods may be subject to different policy conditions which may in turn lead to different persistency experience.

The company would need to consider the extent to which it is intending and able to implement mitigating action to improve persistency in future.

The company would also need to consider the financial impact of the change. An adverse impact of £10m in one year's experience is likely to have a much more significant impact if capitalised through a change in assumptions, perhaps of the order of £50–£100m.

Whilst the company should use assumptions it feels are reflective of future experience it would need to consider the impact of the changes on its perception by the stock market and ensure that it can communicate the rationale for these effectively.

The company should also consider the frequency with which it normally reviews and changes its assumptions, and how long ago they were last updated., and it should consider the impact of the experience information on other areas, such as assumptions used in pricing.

Most candidates were able to make some valid points to answer this question, although relatively few covered a comprehensive range of issues.

(iii)

First the company would want to try to understand the reasons for the increases in surrenders. It could also attempt to benchmark its experience against other companies to see whether it is an industry-wide occurrence or specific to this particular company.

The company should continue to monitor persistency experience carefully.

Customer relationship

It may introduce some form of questionnaire for customers leaving to ascertain the reasons why.

The company would want to try to improve the customer experience in order to improve their affinity with the company. It may try to improve its service levels to increase customer satisfaction, eg by acting to reduce turnaround times for particular tasks.

Alternatively it could consider outsourcing its administration in order to improve customer service levels. The company would need to consider the cost of making these changes and the time taken to implement them. If outsourcing is used then it must also consider quality control and legal issues.

The company may offer enhanced services for high value customers, e.g. those with bonds in excess of £100,000, in order to protect these customers. It may increase or try to improve its communication to customers to create more of a relationship with them, eg by developing periodic magazines.

The company would need to compare the cost of extra services to the capitalised value of the expected improvements in persistency to assess the case for such changes.

It may offer alternatives to customers who request a surrender, e.g. partial surrenders, free switches. It may introduce proactive calling to customers at key points in the policy lifetime, e.g. 5 years, in order to highlight the benefits of maintaining their policy. It would however have to be careful that it was compliant with FSA rules regarding giving advice.

If the experience is the result of a reputational problem then it should address that problem directly and/or improve its brand via PR activity.

It could consider introducing a wider range of products in order to increase brand loyalty amongst its customers.

Distribution

The company may also analyse surrenders by IFA to understand if there are problems with particular accounts. It may reduce commission levels on new business for IFAs with poor lapse experience, or it could cease to do business with certain IFAs.

Alternatively it may introduce trail commission on its existing business to give the IFA an incentive to keep business in-force. The company may however have to disclose this commission and may need to agree an approach with the FSA before implementation.

It would also need to consider the cost of the commission payments and whether the improvements in persistency expected from implementing the action would exceed this.

The company could introduce commission clawback.

Generally, it would also have to consider to extent to which changes to commission structure and/or level would impact new business volumes.

The company may also arrange visits with IFAs to discuss their experience. In particular it may put pressure on their compliance functions if it feels there is any active churning of business.

The company may also try to influence the actions of its own sales team that manage the IFA relationships, for example by including persistency measures in its sales team's remuneration. However, this may be difficult to execute and may require a change of culture in its sales division. It may be met with resistance and the company would need to think about the possible loss of some of its sales support staff unhappy with the change.

It should consider improving its sales training if there is any possibility that higher withdrawals are the result of mis-selling.

The company might consider changing its distribution channel (e.g. to internet or multi-tie) if it feels that there is an unacceptable level of churning activity in its current channel.

Product changes

The company may look to improve its product offering to current customers in order to reduce the exposure to adverse persistency experience. It may look to incentivise customers to keep their policy in force. For example this may be in the form of a periodic cash loyalty bonus, a reduced AMC after a certain number of years. The company would need to weigh the cost of such incentives against the expected capitalised value of the enhanced persistency before implementing this.

It may change its investment manager for any poor performing funds in a bid to improve investment returns. In addition it may increase the number of fund options to give the customer more choice and the ability to move from poor performing funds.

It may also make changes to its pricing of the product for future sales to alleviate the issues for future new business. In doing so, it could compare its product against those offered by competitors.

It may introduce upfront charging to alleviate the capital strain from commission paid at outset. Alternatively it may change the shape of its commission payments to a level commission stream paid each year for example as a percentage of AMC so it is related to the revenue received.

It may also increase or extend surrender penalties such that the company is immune to early lapses. Note that it is unlikely that many of these options (e.g. increasing surrender penalties) could be implemented for existing business. The company would also need to consider its competitive position and the impact on its ability to sell business if it made such changes to product pricing.

Ultimately the company would want to maximise its profits. It would want to ensure the impact on sales was not so great that its overall profitability was reduced. In this analysis it may wish to consider that some of its costs are in reality fixed and will still recur if no business is written.

This was generally reasonably well answered, with candidates covering a good range of ideas. However, some lost time by discussing possible causes of poor persistency rather than concentrating on the actions and their related issues, as required by the question. Many candidates mentioned extra costs as being an issue for several of the proposed actions, but relatively few discussed how this should be compared with the additional profits arising as a result of lower persistency. Most candidates covered fairly well a range of suggestions for changing the product, but few gained many marks from consideration of how to improve the customer relationship.

END OF EXAMINERS' REPORT