**2008 S2**

**Q1** a) *Why best estimate assumption is still used for accumulation method?*

* Loss recognition testing still needs to be carried out even if the accumulation method is used. The determination of a Best Estimate loss ratio is required to determine if losses need to be capitalised (i.e. to determine if a deficiency reserve is required).
* The reserve for Incurred But Not Reported (IBNR) and Reported But Not Admitted (RBNA) claims needs to be determined based on best estimate assumptions of expected claims and best estimate assumptions of projected patterns of claims run-off.
* For the claims in payment under the Group Salary Continuance (GSC) cover, best estimate assumptions are required for the projected termination rates for the calculation of reserves for claims in payment.

1b) *Impact on profit from IBNR estimation*

* The reporting of profit is affected by the level of reserves adopted from period to period. Ultimately this only affects the timing of recognition of profit (i.e. the profits from a block of business are solely determined by the net cashflows arising from that business)
* Mis-estimation of this year’s IBNR will eventually emerge as part of future reported profits, but will not affect total profit over the life of the business
* The historic pattern of claim payment based on the experience of SLL as well as the use of published industry averages can help reduce likelihood of significant mis-estimation of the actual amount of IBNR clams.

1c) The apparent discrepancy could arise from **errors** such as:

* Error in the unearned premium reserves at the start of the period
* Error in the unearned premium reserves at the end of the period
* Administrative error(s) in the receipting or recording of premium payments
* Error in the data underlying the statistical premiums in-force

The apparent discrepancy could also arise for **legitimate reasons** such as:

* A large block of business written and exiting within the period (adding to earned premiums but not affecting statistical premiums at the start and end of the period)
* Timing differences between the receipt of premiums and the recognition of premium income
* Catch-ups / corrections of historic premium miscalculations or errors that have been recognised in the current year

Possible checks/investigations include:

* Reviewing unearned premium reserve calculations on a scheme by scheme basis
* Ensuring completeness of UPR calculations for all schemes
* Co-ordinate a review of reconciliations of premiums received
* Reviewing accuracy and completeness of data underlying statistical premiums in-force
* Analysing the effect of any timing differences between receipt of premiums and the recognition of premium income
* Confirming historic premium errors that have been corrected and recognised in the current year

1d) i. *Increase in “to age 65” benefit period schemes*

* Future Claims In the Course of Payment (CICP) reserves should grow relatively quickly as more long-term claims come on to SLL’s books. However this would not necessarily reduce future reported profits provided the schemes were adequately priced
* There is the potential for increased volatility of reported profits for the next two years arising from this as there is greater uncertainty in estimating the cost of these long term claims
* The shift to longer benefit periods will increase the duration of the CICP reserves, which may lead to greater asset / liability mismatch. If so this may increase the volatility of reported profits over the next two years
* Moving to age 65 benefit period may add to claims expenses which may reduce profit. This increase in claim expenses may be due to the **longer average term** of the claim (more administration required), possible need to **upgrade claims systems** / processes and the likely greater focus on **rehabilitation programs** (early intervention is likely to result in significant cost savings for long term claims)

ii. *Recession*

* In a recession insured lives may have reduced incentives to come off claim (e.g. due to unemployment). This may lead to a decrease in claim termination rates over the next two years and an increase in CICP reserves
* In a recession insured lives may be more likely to claim (e.g. due to unemployment).
* This may lead to an increase in CICP reserves.
* The deterioration in claim termination rates would most likely reduce future reported profits unless the effect was adequately anticipated in pricing the GSC schemes when SLL took them on.

**Q2** a) *why ILL must include the value of P/h’s investments on the liability side of the balance sheet, and the assets backing those investments on the asset side of the balance sheet?*

* **Life insurance accounting standard AASB 1038** requires that Life Investment Contract liabilities are to be treated as financial instruments and recognised at fair value
* Life insurance accounting standard AASB 1038 requires that assets backing Life Investment Contract liabilities be shown at fair value
* The AASB takes this view as the assets are held within the life legal entity and hence must sit “on the balance sheet”, while investment management firms typically have assets in separate trust structures (where the assets sit on the balance sheet of the trust rather than the balance sheet of the manager)
* Consequently the fair value of policyholders’ funds are included on the liability side of the balance sheet, and the assets backing those funds are shown on the asset side of ILL’s balance sheet. The treatment between assets and liabilities needs to be consistent in order for the balance sheet to present a valid picture

2b) *Difficulties in valuing the underlying assets of the trust.*

* The actuary would need to consider whether the asset valuation to be included in the financial statements is appropriate (and in particular if the assets are included at fair value). Any adjustments considered necessary would need to be reflected in both the Life Insurance Contract Liability as well as in solvency / capital adequacy requirements (where these are published as part of the financial statements)
* The actuary would need to consider whether the valuation unit prices, which are dependent on the valuation of the underlying assets, are an appropriate reflection of the fair value of the Life Investment Contract Liability
* The actuary would need to consider whether the difficulties in valuing the trust have created distortions in unit pricing. If so, it may be necessary to consider whether policyholders (both in-force and exited) have been equitably treated. It may be necessary to establish a provision to compensate policyholders if this has been the case.

2c) *Floor guarantees.*

* The ongoing management fee income received by ILL during the period would flow to the profit and loss account
* The one-off option fee is paid by policyholders in return to access a put option on their investment. As this is not an Establishment Fee offsetting acquisition costs as defined in LPS1.04, this fee would also flow to the profit and loss account
* There will also be a profit and loss impact in relation to the Life Investment Contract Liability element of the policy liabilities for this business as this embedded derivative must be valued and allowed for as required by LPS1.04. Note that although the option may be “out of the money” at the moment it very unlikely to have a nil value. Consequently the option value should be recognised as part of the Life Investment Contract Liability
* The third potential effect would be in relation to any costs incurred by ILL in administering and hedging the option (which may or may not be the same as the additional fees charged)

2d) *Issues to be considered before entering into a hedging contract with an investment bank.*

* The protection will come at a cost to ILL, most likely to be significant given the poor investment results of ILL’s investment linked products over the last year. ILL would need to weigh up the investment bank’s proposed charges against other alternatives
* The terms and conditions of the arrangement would need to be carefully scrutinised to test whether the instrument would be effective in protecting ILL against all likely adverse scenarios. If not, ILL would need to consider either additional capital to cover scenarios which aren’t protected or consider alternative risk management strategies
* The treatment of the instrument under Solvency and Capital Adequacy Standards would need to be considered, in particular to ensure that the instrument is effective in reducing statutory capital requirements under these Standards
* There should also be consideration of the impact of the financial instrument on the level of Target Surplus held by ILL
* The credit standing of the investment bank should be considered, as the instrument could become of considerable value in the event of further adverse market movements (i.e. an environment where the investment bank itself may be more likely to run into difficulties)
* The potential for a large exposure to the investment bank and consequent inadmissible assets reserve requirements should be considered.

**Q3** a)

* Higher costs would, all other things being equal, reduce the total profit emerging over the life of the business
* Under MoS, the policy liabilities for life insurance contracts allow upfront commission costs to be deferred and amortised over the life of the contracts. Future reported profits should therefore reduce to the extent of the higher amortisation charge arising each year from the higher commission costs.
* The only exception to this would be if the higher upfront commission costs cause the portfolio to move into a loss recognition position. In this case, at the time of **loss recognition**, there would be a one off decrease to reported profit
* Initial capital strain on writing new business would materially increase following the increase in upfront commissions. There may also be further strain from increased volumes of new business arising from increased agents’ activity.
* “Second order” effects may include triggering a spiral of increasing commissions in the market or increased churn activity, change in dividends which would have further effects on profitability and capital requirements.

3b) *The key items requiring the Appointed Actuary’s (AA’s) consideration are as follows:*

* The financial stability / security of GEL should be the AA’s primary consideration in considering this issue. If the higher dividend rates threaten the solvency / capital adequacy of GEL then the AA must not recommend these rates
* Ability to access additional capital for GEL should the need arise
* The size of any **Investment Fluctuation Reserves that may have built up historically** which could subsidise a higher cash dividend this year
* Whether alternative management action (such as expense reductions) are available to mitigate any losses that may arise
* In addition, the reasonable expectations of policyholders would need to be considered in setting the dividend rate (including any disclosures made by agents). If expectations of policyholders of cash dividends are in the order of 9%, the policies may need to be repriced to ensure that the 9% cash dividend is sustainable going forward
* The degree of equity between policyholders needs to be considered. In particular, a one-off increase in the cash dividend paid out to all policyholders from the retained surpluses which have been built up over a number of years, may not be fair as new policyholders (who will have not contributed much to the surplus) will receive the same return as policyholders who have funded the surplus for a number of years

3c) To: CEO, Grand East Life

From: Actuary

Re: Retention Dividend

*I refer to your request for my response regarding the special “one-off” retention dividend that has been suggested to you. I have a number of concerns regarding this suggestion:*

**[undermining financial security]** First, declaring a higher cash dividend would have led to a significant deterioration in GEL’s financial strength. The cash dividend actually declared is much more in line with what GEL can actually afford to credit to policyholders this year. The payment of a retention dividend would effectively partially reverse this.

**[policyholder inequity]** Second, there are important issues in respect of policyholder equity in this suggestion. Effectively, only those who indicate they will leave GEL will get the retention dividend. It would seem unreasonable for this sub-set of policyholders to benefit whilst those who intended to stay with GEL do not. Apart from the intention to leave there is nothing differentiating these two groups of policyholders, and therefore no basis for what would effectively be differential cash dividends.

**[potential ineffectiveness of proposal]** Third, given the cash nature of our dividends, there would appear to be nothing to stop policyholders accepting the retention dividend and then leaving GEL anyway. This would only serve to increase our costs without any benefit in terms of customer retention.

**[possible abuse]** Alternatively, retention divd could be open to abuse by agent at GEL’s expense.

Finally, the special dividend may be interpreted or misunderstood by customers as a permanent feature of GEL’s dividend policy which may create unrealistic expectations in future.

*There would appear to be a number of alternative options available to GEL in order to manage customer retention including:*

* In our marketing, focus on our prudent financial management and financial security as a selling point rather than just the amount of cash dividend (which may place some of our competitors in financial difficulty)
* Implement internal processes to suggest alternative GEL products to customers who wish to exit
* Only allowing policyholders to receive cash dividends after having a policy for a minimum number of years (as people who have their policies for a short period are generally loss making and hence take away from the funds that can be distributed to other policyholders). It should be noted this may be difficult to sell to the market if it is not used to having restrictions placed on the payment of cash dividends
* Amendment of agent remuneration structures to provide greater incentives to improve customer retention, rather than just a pure focus on upfront commissions

I would be happy to discuss this issue further.

Regards, Actuary

**Q4** a) *AA to consider before setting BE assumption:*

* Review the pricing basis / assumptions for the changes
* Review any experience that may have emerged to date on the new benefits (although noting this may not be credible)
* Compare against any experience / information that may be available from MLL’s reinsurers
* Examine the way that the new features are being used by IFAs in deciding to recommend MLL’s products, to see if there is any potential anti-selection risk

4b) *i. Trend of adding new benefits:*

* Over time this trend would be expected to erode the profit margins in future new business written (all other things being equal) by increasing expected claims costs. Consideration would need to be given to this “margin squeeze” effect on future new business and what allowance should be made in the VNB
* Consideration should also be given to additional anti-selection effects arising from these new features over time on the future profitability of new business
* These effects may be potentially offset by improved new business volumes (as MLL’s products maintain / increase competitive position in the market). Consideration would need to be given to how much credit could be given to this given other competitors could make similar changes to their products

*ii. Level commission:*

* The cost (or benefit) from the shift in commission structure itself would need to be considered.
* As the **VNB is calculated using a risk discount rate higher than the investment earnings rate**, a more level commission structure would reduce the funding cost associated with higher upfront commissions. This should be reflected in the VNB calculation.
* The changed commission structure may have an impact on lapse experience by affecting the behaviour of IFAs. In particular, there may be reduced incentives to “churn” business which may improve lapse experience (but also reduce new business volumes).
* The overall attitude of IFAs to the change should be considered when assessing future new business volumes and growth

4c) To: CEO, Mercy Life Limited

From: Actuary

Re: Potential AV Impact of Development of New Distribution Channel(s)

The development of new distribution channel(s) for MLL to reduce its reliance on IFAs could affect MLL’s Appraisal Value (AV) over the next three years in several ways.

The most significant effects will likely be in the **Value of Future New Business (VFNB)** component of the AV. The following areas should be considered which impact on VFNB:

* The first area to consider is the likely impact on future new business volumes. Particularly in the early years there is a risk that new sales volumes from the new distribution channel(s) **would not be sufficient to replace any lost IFA sales**. If this is the case there would be a negative effect on VFNB. The overall AV will also grow more slowly over the next three years if sales are lower than in previous years.
* The second area to consider is **longer term new business volume growth**. The relativity between the growth available via the new distribution channel(s) in the longer term versus the “natural” growth available from IFAs will be a key determinant in whether the Value of Future New Business is increased or decreased.
* A third area to consider is the relative costs of the alternative distribution channel(s) compared to the IFAs. The ultimate “cost per sale” relativity between the two will be affected by MLL’s effectiveness in developing the new distribution channel(s)
* Finally, the development of new distribution channel(s) may necessitate a change in MLL’s product suite to suit the new channel(s). The relative profit margins in the current products versus any new products will also impact on the VFNB.

In addition to the above the following additional factors may arise that would impact on the

AV over the next three years:

* The shift may lead to a one off or short term “shock lapse” effect on MLL’s business, if IFAs place their business with other life insurers. Such a shock lapse effect would reduce the Value of In-Force (VIF) component of the AV
* The lapse experience of business sourced through other distribution channels may be different to that of business sourced from IFAs. Over the next three years this would be reflected in the lapse assumptions used to determine MLL’s AV

In summary, whilst further detail and analysis is required to assess the impact of the change in distribution strategy on MLL’s AV, there are a number of very important areas listed above that could have a material bearing.

I would be happy to discuss this memo further at your convenience. Yours sincerely, Actuary

**Q5** a)

* Capital **margins on the termination value** (i.e. capital requirements in excess of the termination value) would be a significant component of the MCR Reserve for SF1. The margins on the termination value typically range from 10% upwards
* The resilience reserve for SF1 is also likely to be sizeable relative to the termination value and other liabilities. This is because these are likely to be short term liabilities, whilst a significant proportion of assets are held in growth asset classes
* The MCR Reserve for SF2 would most likely be dominated by the investment linked margin, which is a relatively small % of the termination value compared to the margins on risk business termination values

5b) *Fall below target surplus, restore capital position immediately?*

* The intention of Target Surplus is to reduce the probability of breaching MCR requirements to a level acceptable to the Board
* From time to time it should therefore be expected that adverse fluctuations in experience can lead to ELL’s capital position falling below Target Surplus
* Target Surplus should therefore not be seen as a second minimum capital level (above the MCR) that ELL should always seek to maintain. As a result, it is not necessarily the case that immediate action to restore ELL’s capital level is required

5c) *Capital injection*

* This would result in a short-term improvement in ELL’s capital position and is an appropriate response to the catastrophe event
* However, as it does not address some of the underlying drivers of the deterioration (high expenses and investment earnings volatility) it may not be a solution to ELL’s future capital position

*Liquidate shareholder investments to cash*

* In the short term this should result in a reduction in ELL’s resilience reserves which would improve its capital position
* This would significantly reduce investment earnings volatility for ELL, which should result in improved stability in ELL’s future capital position

*Price increases*

* The price increases themselves will increase ELL’s revenues. **However, it will take time for this to have a significant effect on ELL’s capital position.**
* Such a price increase may result in a “shock lapse” event for ELL which would in turn lead to a short-term improvement in ELL’s capital position as capital is released from this business. However, ELL may be selected against as those lives that will more likely accept the premium increase are likely to be the less healthy lives (who may be unlikely to be accepted for equivalent cover elsewhere), which will have adverse longer term consequences
* It may also reduce ELL’s competitive position in the market, dampening sales growth but thereby **reducing capital strain arising from writing new business**
* The outlook for ELL’s capital position would depend on whether the price increases offset the loss in business volumes

*Close ELL to new business*

* The capital strain associated with writing new business would be diminished, leading to a short-term improvement in ELL’s capital position
* Whilst this would address the issues arising from rapid growth and high marketing costs, it is clearly a drastic course of action and effectively means **moving ELL into a run-off scenario. Under such a scenario, the ability of ELL to cover fixed overhead expenses given reducing premium volumes will become a significant issue**

5d)

* The capital forecast implies a longer-term capital position below ELL’s current Target Surplus policy. The Board would need to be advised that running ELL at this level of capital means the probability of breaching ELL’s MCR requirements is effectively higher than the previous Target Surplus level
* In order to assist the Board in making this decision, advice around the new probability of breach would be required and what this means in practical terms (e.g. scenarios that would lead to a breach of the MCR under the new Target Surplus level)
* The Board should also receive advice about **other management actions** that are available and the capital implications under these scenarios to provide a range of options for the Board

**Q6** a)

* The increases in credit spreads on SLL’s corporate bond assets during the year was higher than the increase in credit spreads applicable to the discount rate used to value the annuity liabilities
* A significant default event in SLL’s corporate bond portfolio
* Since SLL will need to hold total assets for this block of business in excess of the policy liability (i.e. Capital Adequacy requirement), a movement in interest rates (in this case an increase) can result in a greater decrease in asset values than the liabilities
* As the asset and liability cashflows are well matched, it is unlikely that changes in interest rates were a significant contributor to the investment experience profit

6b) *The question is effectively asking whether the immediate annuity portfolio can be combined with the investment linked product in respect of profit reporting:*

* The customer is the same, and there is a link between the annuity payments and the funds that would be invested in the investment linked product
* However, **LPS1.04 specifies that Related Product Groups be a grouping of products where those products are considered by the Actuary to exhibit benefit characteristics and pricing structures sufficiently similar as to justify grouping for the purposes of profit margin calculation, loss recognition or reporting**. Immediate annuities and an investment linked product do not meet this criteria for grouping.

6c) *Analysis of Profit*

* *[****Loss****: higher annuity payments during the year]* There would be more annuity payments made during the year than assumed. This should emerge as an experience loss in the analysis of profit
* *[****Loss:*** *higher liability for future annuity payments]* Lower than expected mortality means there would also be **a higher liability for future annuity payments** than expected. This should also emerge as an experience loss in the analysis of profit
* *[****Profit****:* *lower DAC runoff]* There would also be an offsetting experience profit as the implied DAC runoff would be better than expected with lower mortality
* The present value of future profit margins (PVFPM) **should increase from the previous valuation when calculated using the previous valuation assumptions and profit margins carried forward**, as the value of annuity payments will be higher than expected
* **If the annuitant mortality assumptions are revised downwards in light of experience, the PVFPM should decrease accordingly**

6d) *Recapture from the reinsurer the immediate annuity liabilities beyond 20 years’ duration, and to also cease reinsuring future new business:*

* The recapture will involve SLL assuming liabilities for annuity payments beyond 20 years’ duration. In return SLL would need to be paid by the reinsurer. The price to be paid by the reinsurer will be a critical factor in determining the viability of the recapture
* In recapturing these liabilities, SLL will retain significant annuitant longevity risk. SLL will need to consider whether it has sufficient capital resources to support this risk
* SLL will need to source appropriate assets to back the long term liabilities. Given the relative shortage of assets of suitable cashflow duration beyond 20 years, SLL will need to consider whether the higher yields currently available on assets are sufficient to offset the costs of any potential cashflow mismatch and / or reinvestment risk
* SLL will also need to consider whether the credit quality of available long term assets is suitable having regard to SLL’s capital resources
* SLL will need additional capital to support investment, credit and reinvestment risks on the liabilities to the extent matching assets are not available. SLL will need to consider whether it has sufficient capital resources to support this risk
* The much longer liability duration could potentially increase the volatility of reported profits, especially if close cashflow matching cannot be achieved. SLL will need to consider the impact of this increased volatility on its stakeholders
* There would potentially be an impact on SLL’s **Target Surplus policy** and level given the higher level of risk being undertaken
* **The impact on future annuity pricing would need to be re-assessed.** In particular, the cost of reinsuring the tail would need to be compared to the costs (**including capital costs**) of retaining the tail. Pricing may need to be amended to ensure adequate returns are generated on the new level of supporting capital