**2015 S2**

**Q1** a) **Short term:**

* Adviser will have incentives to churn for those policies after responsibility period to earn the high initial commission which will not exist after the reform.
* In short term we’d expect to see increase in churn (the practice whereby advisers encourage policyholders to replace their existing policies with a similar policy so that they can collect the initial commission again) as advisers look to churn while they can.
* We might also expect to see increase in sales of upfront commission policies while advisers look to take advantage of higher upfront commissions.
* Generally might expect to see an increase in sales so that advisers can get in before the 3 year responsibility period starts.

**Long term:**

* They will have less incentive to churn as the responsibility period will extend to 3 years.
* In the longer term we’d expect to see less churn because of the longer responsibility period (the adviser can only churn policies that have been in force for 3 years or more) and reduced financial incentive (most they can get in year 1 is 60% versus 120% previously).
* Sales that would have previously be sold with upfront commission are more likely to be sold with hybrid commission going forward, rather than level commission, as advisers seek to move to the closest commission model.
* We might also see some advisers exit the market if they believe that will get higher remuneration in another industry (e.g. general insurance).
* If all life companies are operating on the same commission structure, then advisers can no longer use this as a factor when deciding which product to advise their client to buy (this should result in a better outcome for the client). They’ll look for other factors (e.g. premium, benefits, customer service) to distinguish between life companies.

1b) Key financial reporting metrics of the business that will be impacted by the changes in Adviser behavior include sales, expenses, commission, lapses, claims, profit, capital position, value of new business & value of in force business.

**Sales**

* The level of sales is impacted by policy counts and average premiums of new business.
* In the short-term, policy counts for Salt & Pepper are likely to increase (as advisers look to write as many policies before the commission structure change).
* In the long-term, policy counts could increase or decrease due to a combination of the following factors:
  + Assuming no change in share of adviser market & reduction in overall adviser market due to advisors exiting the market, would expect Salt & Pepper sales to decrease as Salt & Pepper only sells through adviser.
  + Sales would decrease due to decreasing churning activities.
  + Sales to increase, assuming increase in share of adviser market due to being competitive on non-commission factors & non change in overall adviser market.
* Average premiums may increase as Advisers seek higher net worth policies to increase their revenue – this could lead to an increase in sales.

**Expenses**

* Variable expenses are linked to the sales volume and therefore will be affected by the change in sales volumes.
* Fixed expenses are reasonably independent of sales volume and therefore should be unaffected by the change in sales volumes.
* Expenses will generally be influenced by the commission structure change (any change costs money) but should be largely unaffected by the adviser behavior.
* There may be more emphasis on flat sponsorship payments to dealer groups instead of volume driven incentive arrangements (assuming these were also no allowed following the changes) and hence an impact on the expense assumptions (albeit overall outgo may be unchanged).

**Commissions**

* Initial commission will reduce & renewal commission will increase to reflect no longer selling upfront business (and replacing this with hybrid/level business).

**Lapses**

* In the short-term, lapses for Salt & Pepper are likely to increase (as advisers look to churn while they still can).
* In the long-term, we'd expect to see lower lapses as a result of less churn.

**Claims**

* Would expect no change in claim experience unless there was a change in mix of business as a result of the change in commission structure.
* However, the change in the level lapse rates would impact on claims due to the impact of selective lapsation. In the shorter term, customers moving to other providers due to increase churn activity would be the healthier lives in order to get through the underwriting process. The lives remaining would thus be less healthy and hence lead to an increase in claims experience.
* Lower lapse rates in the longer term should mean a reduction in selective lapsation and hence less deterioration in claims experience from this effect.

**Profit**

* The overall impact on profit will depend on the interaction of each of the items above. There is likely to be a reduction in profit in short term due to the increase in lapses but over the longer term there should be an improvement in profitability as lapse rates reduce to a lower level than before the implementation of the reform package.

**Capital**

* The lower upfront commissions should lead to make writing new business less capital intensive.
* If reinsurance support is providing capital relief, then there is less need for this type of reinsurance going forward.

**Value of Inforce Business**

* Given that there are no assumptions or pricing changes, there will be no immediate impact on VIF. In the short term, there may be some reduction due to increased lapsing.

**Value of New Business**

* Value of new business is the present value of future profits from sales during the reporting period. It is driven by sales (more sales equals' higher value of new business assuming the business is profitable), expense assumptions (more expenses equals' lower value of new business), lapse assumptions (lower lapses equals' higher value of new business) and mix of business (selling more profitable business equals' higher value of new business) and other assumptions (such as claim & economic assumptions).
* Because we're assuming no change in assumptions, the key drivers are going to be sales & mix of business. Sales have been covered above.
* Short term or long term impact to Value of New Business will likely to be different.

1c)

* **Changes in non-economic assumptions cannot change the policy liability**. So any change in BEL is offset by a change in present value profit margins so that the overall policy liability is unchanged.
* Different commission structures have different renewal commission. Although the overall lapse rate is unchanged, **the reduction in renewal commission (because less policies in force) for upfront business will be more than offset by the increase in renewal commission (because more policies in force) for hybrid/level business**.
* Another possible cause of the decline in the PVPM relates to the different level of outstanding deferred acquisition costs (**DAC**) for the three commission types. The Upfront and Hybrid commission structures have contributed to the DAC through their initial commissions. The expected recovery of this DAC will be impacted by the change in lapse rates. **The small increase in the lapse rates of the Upfront business means that the recovery period is shortened causing a reduction in future profit margin**. However this reduction will be offset by the Hybrid business where the larger reduction in lapse rates has extended the recovery period and thereby increased future profit margins. The degree of offset will also depend on the current DAC balance noting that this has been impacted by past lapse experience.

1d) Tax for VNB!!!



VNB = [PV Premiums – PV Claims – PV Renewal Expense – PV Renew Comm – Initial Comm – Initial Expenses]\*(1-30%)

* VNB has reduced as a result of the introduction of the new commission structure. This is because the reduction in Initial Commission is more than offset by the increase in PV Renewal Commission (so while we’re paying lower initial commission we’re paying more renewal commission in the long term) where all other assumptions remain equal.
* This result is sensitive to the choice of PV Factor for Renewal Expenses. If the PV Factor is reduced below a certain level then the VNB in 2016 would be higher (all else being equal).
* If we also changed our lapse rate assumptions (to use different lapse rates by commission structure) we might expect overall value to increase as the aggregate lapse rate reduces (the lapse rate for upfront is significantly higher than for hybrid & level). A positive VNB means that we’re making profits off this business and reducing the lapse rate would mean we expect to make profits for longer (therefore increasing value).

**Q2** a) see spreadsheet

2b) i. see spreadsheet:

set PL=0 at the end of year 3 since it’s recognized as a new policy. This means DAC is not being recovered.

2b) ii. To: CFO, Fork & Knife Life

From: Life Insurance Valuation Actuary, Fork & Knife Life

RE: Impact on emergence of profit over the life of the policy resulting from a cancel-replace.

Dear CFO,

As part of our annual lapse investigation work, a noticeable increase in the number of policies that are being cancelled and replaced has been observed.

These policies have the following characteristics:

* A change in policy terms & conditions were requested by the policyholder resulting in the policy being cancelled and a new policy being issued.
* No upfront commission is paid again.
* As such, the cancellation of the old policy results in higher recorded lapses and higher recorded sales

**Impact on profit emergence**

* I have performed some analysis of the impact based on a typical policy, assuming the cancel replace to happen at the end of policy year 3.
* As a result of the cancel-replace, the policy has a loss at the end of year 3, reflecting the upfront commission costs not being recovered.
* From year 4 onwards, the profit emergence pattern is similar to that of a level-commission policy, with a higher profit margin (24.8%) compared to the original policy (10%).
* In other words, a loss will be recorded at the end of year 3, followed by high profit levels in the remaining 7 years.

**Impact on present value of total profits**

* Total present value of profit is equal to the present value of profit margin release plus **interest on DAC asset**.
* **Cancel and replace activity (*after all, no assumption being changed*) has no impact on the present value of profit margin release as policy cash flows are not affected and profit margin will reset.** The present value of total profit emerging from profit margin release would stay the same. ($947 in this example).
* However, the PV of interest earned on negative policy liabilities would reduce (by $200 for a typical policy), reflecting the deferred acquisition costs being written-off at the end of year 3. As a result, the PV of total profit would reduce (by $200 for a typical policy).

Please free to give me call if you wish to discuss further on this matter.

Kind regards,

Valuation Actuary

**Q3** a) *Issues to be considered and the risks involved in re-entering the lifetime annuity market:*

*Dear CEO:*

I am writing to you setting out the key risks and issues that need to be considered in re-entering the lifetime annuity market. These are set out below along with some suggested mitigations for each of the risks.

|  |  |
| --- | --- |
| **Risks** | **Mitigation** |
| [Capital] Given the liability would be expected to be very long, the required capital amount for the lifetime annuity could be high. The company needs to consider whether they have the ability to raise more capital to support the new business. | Enter into a reinsurance treaty which could reduce the initial capital strain as well as the capital required capital.  Part of the issue could be resolved by having the YRT business which could internally hedge the longevity risk arising from the annuity business. |
| [Expertise] The company may be lack of the expertises, such as underwriting team for the lifetime annuity and the sales force. | Coordinate with third party.  Hire external underwriting professions, say from the Cookies & Cream Life.  Hire independent advisers to sell the new product. |
| [Strategic risk: Profitability / Target Market] The company should consider its target market. Should it aim at the White Collar or Blue Labor? The embedded assumptions could be totally different. | Hire external consulting or reinsurance to understand the profitability of the lifetime annuity for each market segment. |
| [Legal risk] The term and condition of the new business should be in line with the APRA requirement | AA needs to sign off the product design before it being launched to the market. |
| [Mis-price] |  |
| [Longevity risks] This is the risk that people live longer than we have assumed when setting the premium rates | * Reduce the risk through reinsurance * Reduce the risk through product design. E.g. fixed term annuity/ term certain annuity with guaranteed benefits for a chosen term. * Longevity risk is a natural hedge against our existing term business (and we should consider cross-sell opportunities for the annuity product to our existing YRT policy owners). * Need to consider the demographic profile of the target market |
| [**Asset liability mismatch risks**] This is the risk that arises when the assets are mismatched with the liabilities. | * The asset selection needs to be carefully considered with matching the underlying liability duration in mind. * It may be difficult to **find sufficiently long dated bonds** to match the long tailed nature of the annuity liabilities |
| [**Operational/Administration risks**]  This is the risk that **errors occur due to operational or administrative issues. The existing process for administering the legacy book of lifetime annuities is manual and spreadsheet based**.   | * It is likely that we need to **invest and upgrade our administration system**. The cost may be prohibitive and hence need to a more comprehensive cost/benefit analysis. * There will be significant resourcing requirements both in the short term to develop the capability to develop the product, pricing and distribution of the new Lifetime Annuity business and to administer going forward. There is a risk that there isn’t sufficient resourcing and that management attention is diverted. * Need to develop a clear and achievable project management plan, and may need to seek external consulting support. * Critical to involve all relevant stakeholders early on to ensure concerns are addressed * Given that the existing Term Certain Annuity business already has a robust policy administration system, then this could be adapted to administer Lifetime annuity business going forward. |
| [**New Business and Expense risks**]  It may not be possible to get sufficient volumes of sales to support overhead costs and initial project costs.   | * Need to conduct a cost and benefit analysis. * Currently Cookies & Cream dominates the annuity market. We need to assess the likelihood of being able to compete for a share of the market (through competitive pricing or product differentiation). There is a risk that we don’t attract sufficient sales for this product to be viable. * **Success will also depend on a significant change to the legislative environment for annuities, in particular the tax treatment.** |
| [Risk Appetite/Capital Considerations]  Higher capital support will be required as lifetime annuities are exposed to longevity risk and asset liability mismatch risk and well as to fund the investment required to launch this product and build the systems to administer going forward | * The source of this additional capital will need to be determined. * Need to consider use of reinsurance to reduce some of the capital requirements. * **Capital projections and stress testing would be necessary and considered as part of a broader ICAAP considerations.** * Need to consider Steak & Kidney’s **Risk management framework and Risk appetite and engage with the Board** to consider how this proposal fits in with these. |

3b) [Diversification benefit] The required capital would be lower, as the company has YRT business in its portfolio. As a result, the longevity risk can be internally hedged.

**Insurance Risk Charge Diversification**

Steak & Kidney future capital requirement will benefit greatly due to its natural hedge against the existing mortality risk which will result in less insurance risk charges as a result of the prescribed diversification matrix in LPS115 paragraph 42.

[NB] Given the company’s life annuity would be totally composed by new business, the capital strain will be more than the competitor.

[Price] As a new entrant, the price may be more competitive hence the capital requirement could be higher.

[DAC] A large upfront expense would occur since there is a need to build the new team, admin system. Therefore, the company’ capital would be affected by how much initial cost they can defer.

**Capital Base Synergy**

Steak & Kidney future capital base will be greatly enhanced as a result of selling both annuity and YRT business. This because:

* Both the YRT and annuity business are part of the **same product group (non participating benefits without entitlement to discretionary additions**) for capital calculation.
* Policy liability for annuity business will be positive due to large initial instalments
* Adjusted policy liability for annuity = max (CTV , RFBEL) according LPS 360 paragraph 10 (d).
* Policy liability for annuity business > its RFBEL (assuming positive profit margin), hence, result in an increase in capital base after allowing for the difference between policy liability and adjusted policy liability.
* LPS 360 paragraph 10 d) CTV for annuity cannot be less than RFBEL.
* Liability adjustment to capital base (reduction) from YRT will be offset by a liability adjustment to capital base (increase) from annuity. Large negative policy liability of YRT business will be offset by the positive policy liability from annuity business, hence result in capital benefits from selling both YRT and annuity business.

**Operational Risk Charge**

This depends on the premium growth in the reporting period. Given that we are introducing a new product, the **growth** would be expected to be large in the short term hence increasing the operational risk charge.

**Supervisory Adjustment**

Given that this is a new product, APRA may prescribe a supervisory adjustment to capture the business risks not adequately allowed for in the standard capital calculations, if it perceives the strategy as risky. This will increase the total capital requirement.

3c) The points to include in my response to the CEO are as follows:

* The Target Surplus methodology will need be reviewed in light of the introduction of lifetime annuity business. As the Board owns the Target Surplus policy, it is important to communicate the change effectively.
* There are many different views over the definition and evaluation of Target Surplus (Board vs management vs regulator vs industry). The revised policy and calculation method needs to balance each stakeholder’s interest.
* Steak & Kidney’s Target Surplus is currently defined as the amount of assets to be held within Steak & Kidney’s shareholder and statutory funds in excess of the Prudential Capital Requirement such that Steak & Kidney can continue to meet the Prudential Capital Requirement over the next 12 months to a confidence level of 97.5%. The management may want to revisit this definition taking into account the new risks to reassess what level of additional comfort is the Target Surplus intended to provide. The following factors will need to be considered:
  + The time period over which the Target Surplus is deemed to provide comfort to the company’s regulatory position.
  + Probability of sufficiency of continuing to meet the regulatory capital requirement over the defined time horizon.
  + What risks needs to be included
  + The ability of the Company to raise capital and the timeframes involved.
* The methodology should **consider the following risk** associated with selling lifetime annuity business: Longevity risk, administration/operational risk, asset liability mismatch risk, new business risk.
* **For longevity risk,** the target surplus should account for the impact of adverse changes to assumed level of mortality. Target surplus can be determined by stressing the regulatory balance and assessing the change in excess assets position over 12 months. The change in profits, the Capital Base, and Prescribed Capital Requirement (PCR) is modelled separately for the stressed longevity risk.
* **For administration risk**, the target surplus should allow for the impact of failure of the company’s new/old administration process on Lifetime annuity. Different scenarios of possible process failure should be considered, and assessed separately.
* **For asset liability mismatch risk**, it can be quantified in the same way as for the longevity risk. The severity of the stresses can also be determined in the same way as for longevity risk – that is by scaling down the LAGIC stresses.
* **For new business risk**, the target surplus should allow for the risk of required capital being higher than expected due to unanticipated new business sales.
* **Diversification between different risks** needs to be considered and incorporated appropriately. For example, having both mortality and longevity risks on the book. Allowance should be made for future mortality improvements, and how these will impact different cohorts of policyholders. The hedge between the longevity of the older age annuitants may not be a perfect hedge to the younger life insurance policyholders.