EXAMINERS' REPORT

November 2011 examinations

Subject F101 —Health and Care Fellowship Principles

INTRODUCTION

The attached report has been prepared by the subject's Principle Examiner. General comments are provided on the performance of candidates on each question. The solutions provided are an indication of the points sought by the examiners, and should not be taken as model solutions.

Question 1

Part (i) of this question was generally poorly answered. Many students wrote insufficient points for 6 marks. The generic answer of funding lifestyle changes etc. was repeated verbatim by the students and in some cases students mentioned taxation planning which is irrelevant to the scenario. Credit was given for points relevant to the low income market. Many students missed the consequences of a payout linked to annual salary which will be insufficient income protection if the insured is incapacitated.

Parts ii and iii were generally well answered

(i)

- Proposed cover is for core conditions
- So cost will be low because low probability of a claim
- For low income market will not address need of covering medical expenses
- Also does not cover disability from other causes
- Low income market may not understand defined conditions
- Will be a problem if people become disabled and are not paid due to other cause
- Reputational risk
- Level of cover of 1x salary will not replace income
- Particularly if young
- Ceasing at retirement age keeps costs down
- Probably not appropriate for low income market
- Should at least add total permanent disability as a catch-all
- High risk of unemployment - waiver of premium benefit?
- The distribution channel is generally for higher income/financially astute individuals
- Probably not a suitable marketing channel to reach target market, although worksite marketing would be feasible
- Keyman cover (appropriate justification needed to be given here)
- These individuals probably have bank accounts so using tied agents through banks maybe a more suitable option
- Individuals may not understand that no payment will occur if death occurs in the deferred period
- This channel may help 'sell' the product as conditions covered (and not
- covered) need explanation

(ii)

- No initial underwriting will save initial costs
- Also makes sales process much simpler
- Only underwriting when a claim occurs
- Low prob of claim means affects only a small number of policies
- But need to ensure that the definition of a pre-existing condition is properly communicated
- Low income policyholders unlikely to understand
- Will depend on how product is distributed
- Repudiation of a claim will lead to loss of confidence in cover
- May cause others to lapse

- Limited underwriting (medical questionnaire rather than tests etc) probably better.
- Reduces new business strain
- Misselling will only be picked up at claims stage
- Underwriting at the time of claim will cause delays in payment
- Low income market may not have means to have had tests to be aware of pre-existing conditions
- It is difficult to establish at the claims stage what was pre-existing

(iii)

- Initial expense will increase capital required for the product
- Will encourage brokers to sell the product – higher volumes
- May cause misselling – already a risk with the structure of the policy and low income target
- Lapses likely – expense risk especially if there is a cooling off period
- Will need to have clawback mechanism
- Will create credit risk with brokers
- Ongoing commission more appropriate to encourage communication with policyholders
- matches effort of broker as most of the effort will be at policy inception
- may encourage churn

Question 2

Many students failed to include any analysis of the cashflows in part (i) of the question and so the reasons provided were generic to reinsurance rather than considering the scenario presented in the question. Part (ii) was generally well answered. In part (iii) students needed to consider the perspective of the regulator and what information they would require for inspection. Many students were unable to apply their answers to the regulator's perspective rather than that of the reinsurer or insurer.

(i)

Cashflows:

Net premium (ignoring interest) is R1.9m so benefit depends on level of recoveries

- No Claims over 3 year period means insurer gets profit share of R1.8m so net cost of R250k over 3 years
- Recoveries of R1.25m means break even.
- Recoveries of more than R1.25m mean a net recovery

So insurer would get value if expects recoveries to exceed R1.25m.

Protection against a larger than expected number of large individual claims

May enter into the arrangement for financial reinsurance to manage tax position, solvency.

(a)

- Role of the regulator is to ensure insurers operate on a financially sound basis
- Also concerned about fair treatment of customers
- Need to ensure that contract is reasonable and fair
- And that reinsurer has adequate capital to cover the risk
- May require insurer to obtain alternative quotes to prevent collusion
- Also will consider reasonable contractual terms such as duration, notice period

- And levels of commission
  Ensure that there is a genuine transfer of risk and reinsurance not being used for regulatory or tax arbitrage

(b)
- Details of risk to be covered
- Analysis of claims experience to demonstrate need (stochastic modeling of claim frequency and claim size)
- Alternative quotes
- Independent actuarial report
- Contractual terms
- Declaration of any links between parties / conflict of interest
- Solvency information on reinsurer

Question 3

Part (i) was well answered although students need to be careful to suggest that reinsurers would provide data without an associated reinsurance contract. Most students discussed the different markets under part (ii) but did not conclude that different pricing would be required. Reasonable attempts were made for part (iii) and (iv) but part (v) was poorly answered due to students not applying their responses to the scenario i.e. rapid business growth and its associated risks. Parts (vi) and (vii) were reasonably answered although many students did not identify that the prescribed asset is similar to a corporate bond.

(i)
- Industry data: If available, this may need to be adjusted to take into account any differences expected in the lives your product would be targeting.
- National Population Statistics: If available, this would need to be adjusted to allow for the target market and for any effects of underwriting and selection.
- Data from other operations within the organization: This would need to be adjusted to be more country specific but may give a guide on how to adjust the local industry or national population statistics.

(ii)
There are effectively two different target markets, rural and urban, with different needs.
Possible that the company would only want to sell to one target market
If looking at selling in both urban and rural communities, would need to price each product separately
Every assumption would need to be separately considered for the two different target markets
If only one set of assumptions used, the business mix assumption would become extremely important and would require appropriate sensitivity testing.

(iii)
The national health scheme is likely to lead to greater access to healthcare for citizens of Smindia. This could have the following impacts.
- Decrease in claim inceptions: If people get better treatment, they may well be fully recovered by the end of the deferred period.

- Increase in claim inceptions: In the past, people may have died during the deferred period and therefore would not have claimed. However, with better access to healthcare, the claimants may live for longer and be able to claim.
- Decrease in length of claims: Similar to the point above, some claimants may recover and return to work sooner than they would have without access to health care.
- Increase in length of claims: With greater access to health care, some claimants may live for longer but still be unable to work. This would increase the length of time for which some claims may be paid.
- No change: If the company is only targeting the wealthy urban population, the clients may already be in possession of very good private healthcare which may not be impacted by the national health insurance scheme.

(iv)

- Reinsurance: Original terms or financing reinsurance could be used to reduce the reserves held by the company as well as to reduce the cashflow strain from paying out initial expenses and initial commission.
- Set limits on the future new business that will be accepted e.g. only accept the first x amount of cover written each year
- If the strain is a result of large amounts of upfront commission, the company could consider changing its commission structure
- Raise capital by asking the global company for additional capital or even considering a partial listing on the local stock exchange

(v)

- Business Mix not in line with assumptions: Assuming that the appropriate information was recorded for each policy, analyse the amount of business from the wealthier urban population compared to the less wealthy rural population. If the mix of business is different to that assumed when pricing two options are available:
    - Change the assumption in the pricing to the mix that has been sold, allowing that this could increase the price and drive the better risks away
    - Change the commission structure or incentives to ensure more of the profitable business is sold.
- Pricing assumptions incorrect resulting in unprofitable business:
    - Analyse morbidity experience and compare to pricing assumptions. After only one year, it is unlikely that there will be sufficient data to do a full morbidity investigation.
    - Compare actual expenses (renewal and initial) to those allowed for in the pricing basis. If the expenses are significantly higher than priced for, change your pricing assumptions.
- Insufficient staff to properly underwrite and administer policies and assess claims
    - Analyse the number of backlogged policies in each of the various stages and determine how long it is taking to perform the necessary services.
    - Audit a random sample of policies that were underwritten as well as some that were not underwritten to determine if the underwriting was appropriately done. Similarly audit a sample of the claims which have been assessed.
    - If the above 2 analyses point to inadequate underwriting, claims assessment or too long backlogs additional staff may need to be hired. An option would be to ask your reinsurer to help out with experienced staff on a temporary basis.

- Systems may not be able to cope with such large volumes and as a result data may not be complete and accurate
    - Compare the number of policies being underwritten each month to the volumes of new business being shown on the administration system.
    - Your analysis of backlogs may indicate that a large proportion of policies have not been captured on the system.
    - Ensure all the details are captured accurately on the system, by checking sample policy application forms to the data on the system.
    - If systems are not adequately coping, additional staff could be hired or a new system may need to be investigated for future implementation.

(vi)

Active lives reserves

- Benefits are guaranteed and increase in line with salary inflation. However, the reserves are relatively small.
- Would consider real investments i.e. property and equity with some gilts as well

Claims in payment

- Benefits guaranteed and increasing in line with salary inflation
- Where possible match liabilities with assets of appropriate terms
- Would generally invest in government bonds as well as index linked gilts, if available.
- Would also consider highly rated corporate bonds

(vii)

The infrastructure projects could effectively be structured to be corporate bonds. There may even be some that could provide returns that are inflation linked.

Depending on any government guarantees provided, these projects could be rated highly enough to be able to be included in the claims in payment reserves.

However, it is likely that the company will invest their free assets in the infrastructure projects as this is a new asset category and future returns are more uncertain. If the free assets are not able to contain the full investment, the rest of the investment would need to be made by the policyholder funds.

Question 4

Generally candidates made a good attempt at part (i) of this question. Marks were lost for not stating the mortality and morbidly basis as well as failing to state that premiums are only waived when the benefit becomes payable (i.e. not during the deferred period).

Part (ii) was answered poorly by most candidates. Very few candidates identified the different types of reserves that are required at different stages (i.e. depending on whether the lives are healthy or claiming), and most answers rather focused on the different reserving methods depending on the purpose of the reserves and how assumptions would be set, which is not what the question had asked for.

Part (ii), answers were relatively poor as they lacked application. Many candidates simply listed the generic mechanisms of managing the risks associated with options without applying them to the question. Additionally, most candidates explained the assumptions that are

needed for the Conventional or North American methods instead of explaining that the cost of the option is the probability of a claim incepting after age 60 and the additional cost of the benefit payments being extended.

For part (iii), most candidates failed to mention that the North American method could be the best method in this instance as one would need to model more serious claims. Many candidates also repeated the answers that were given in part c) whereas this question was testing application in a different scenario.

(i)

Let net premium = P

Let salary = S

$$P\left(\bar{a}_{x:\overline{60-x}|} - \bar{a}^{HS(1/all)}_{x:\overline{60-x}|} \right)$$

$$= 0.85\,\bar{a}^{HS(1/all)}_{x:\overline{60-x}|} - 0.25\bar{a}^{HS(3/all)}_{x:\overline{60-x}|}$$

x = age

Premium waiver does not include the deferred period.

Gross premium = $P/0.8$

Pricing basis for mortality and claims.

Premium expressed as % of salary

(ii)

- Reserve for policyholders who have yet to claim
  - Calculated with reference to pricing basis
  - Include policy and claim expenses
  - Formula (1.5)

$$S\left[0.8\bar{a}^{HS(1/all)}_{x:\overline{60-x}|} - 0.2\bar{a}^{HS(3/all)}_{x:\overline{60-x}|} \right]$$

- Reserve for claimants in deferred period
  - Claim may not incept
  - Allow for claim expenses
  - Formula (1)
  - Ignoring recovery in deferred period

- $S\left[0.8V^{t-\overline{ss}}\bar{a}_{x+t,0} - 0.2V^{2+t}\bar{a}^{\overline{ss}}_{x+2+t,2}\right]$

- Reserve for claimants in initial 2 year period
    - May have different basis (mortality) but lighter more conservative
    - Greater probability of recovery in first 2 year period
    - Provide for expenses
    - Formula (1)
    - t = period since claim incurred/diagnosed in the first period:

- $S\left[0.8\bar{a}^{\overline{ss}}_{x,1} - 0.2V^{2-t}\bar{a}^{\overline{ss}}_{x+2-t,2}\right]$

- Reserve for claimants after initial 2 year period
    - Heavier mortality and lower recovery more realistic
    - Provide for expenses
    - Formula (1)
    - t = period since claim incepted/paid

- $S\left[0.6\,\bar{a}^{\overline{ss}}_{x,2}\right]$

- Other reserves
    - IBNR for policyholders in deferred period who have not yet notified insurer
    - Contingency reserves (including Catastrophe Reserves) for variations in experience, changes in environment
    - Solvency reserves for statutory requirements
    - UPR and URR reserves if this policy is sold as a Group policy

- General
    - Reserves and assumptions should be prudent (Note: Reserves should NOT be calculated on a more prudent basis than the pricing basis)
    - Starting point is the basis of the previous valuation – ensure consistency

(iii)

- Key risk is selection by lives expecting to claim between age 60 and 70
- And additional cost of benefits if claim incepts earlier
- Probability of claim increases significantly in the period
- Option would mean increase in premium
- Can manage risk by underwriting for health risk
- Maximum age at which option can be taken up (eg by age 50)
- Requirement to be actively working when claim incepts
- Could have reduced cover between age 60 and 70
- eg 75% of benefit at age 60 or 50% cover for claim incepting
- Option only applicable to Standard lives at policy inception
- Definition of disability may need to change at older ages (i.e. to Activities of Daily Living)
- can price using Conventional or North American method but unlikely to have data for North American method.

- may be difficult to obtain data on experience after 65
- price 2 components
- extension of benefit payment period to age 70
- claim can incept after age 60
- Cost of the option is calculated as the expected present value of the additional benefits and the additional premium is spread over policy duration and is charged at benefit inception

(iv)

- Significant risk of antiselection by claimants with more serious conditions
- 80% is a very high replacement ratio which disincentives claimants to return to work
- Premium would need to be a lump sum which could be prohibitive for some
- Offer is once-off at claim notification stage i.e. undertake to pay lump sum at end of deferred period if claim is accepted.
- May have proceeds from CI cover to claim
- May incur higher claims costs as claims assessment needs to be more rigorous
- Best to use North American method and assume more serious claims (can categorise experience by diagnosis) more likely to exercise
- credit was given for suggesting a formula for the additional cost of the option

Question 5

Answers to this question were disappointing as student failed to apply their minds to the specifics of the question. Most answers were generic in their consideration of risks and did not deal with the particular issues of travel insurance or the specific risk transfer described in the question. Some students did not pay attention to the specific parties in each sub question.

(i)

The advantages of the arrangement for the travel insurer are:

- They do not require specialist knowledge of the health insurance market – complexity of needing to validate and settle claims in multiple regions
- Some regions may require a health insurance license if they are settling health claims
- The health insurer is likely to have existing relationships with health care providers and may thus be in a better position to manage claim costs
- The health insurer will have a larger pool of healthcare risks and may be able to absorb random fluctuations in experience better

The disadvantages of the arrangement are:

- The travel insurer is likely to be passing on a profit margin to the health insurer
- Given the lack of expertise the travel insurer may not be able to assess the price of the health cover accurately
- Third party risk – travel insurer would still be liable for claims

(ii)

- The travel insurer pays a fixed premium across to health insurer – this premium may not be related to the risk factors of the policyholder. The health insurer would then exposed to the risk that the premium is inadequate and that the mix of business sold is worse than what was anticipated.
- The health insurer has no control over the regions to which people will be travelling. There is currency risk involved. The health insurer would be exposed to the risk of the mix of business by region being different to expected.
- Risk is likely to be concentrated with groups of travelers and travel within particular regions.
- The health insurer does not have control over the business sold and the resulting risk profile of policyholders
- The health insurer does not have control over the quality of initial underwriting
- It isn't clear how the underwriting of claims would be handled. The risk for the health insurer is that the travel insurer will approve claims and they will have to settle those claims
- Risk of catastrophes
- Risk of policy wording not being clear
- Risk of volume of business sold being lower than expected (so health insurer does not meet fixed costs associated with administering the contract) or higher than expected (strain on systems, staff and capital)
- Risk of claims occurring in regions where insurer does not have an office or any capacity

(iii)

The following tools could be used to manage the risks outlined above:

- Clear contracting: procedures around underwriting, claims assessment, disagreements over policy wording and sales should be negotiated and clearly documented
- Reinsurance could be obtained to protect the health insurer against catastrophes and concentration of risk
- Ensure that there are limits to benefits and these are in a single currency
- Negotiate premium that varies in line with basic risk factors such as age
- If possible, could negotiate reviewable rates
- Could negotiate a profit sharing arrangement to limit downside risk

Question 6

Many students missed the question altogether by only discussing the implications of the change to the reserving basis and not the body of the question being the rehabilitation program. Again most answers were straight bookwork answers without applying this knowledge to the specifics of the question.

- This is an income replacement product which is a long-term insurance product.
- Relevant reserves for this question will include:
    - Active life reserves√ (or prospective premium reserves) are typically the discounted value of future expected claims, expenses and future premiums
    - IBNR
    - Reserves for claims that have been reported and not yet fully settled
- Lightening the reserve basis has the immediate effect of lowering reserves; therefore increasing profit; and increasing and bringing tax liability forward; and that free reserves will be higher enabling higher new business rates with no new capital.
- For the active life reserves will need to take account of the reduction in future expected claims as well as the expected increase in expenses associated with the rehab program.
- If claim amounts are expected to reduce this will need to be taken into account in the IBNR calculation. Separation of claim numbers and claim amounts with just claim amounts adjusted.
- The rehab program will be expected to increase the claim termination rate.
- However, not all cases will be eligible for rehab √and rehab will have a differential impact on the termination rate depending on the characteristics of the claim (e.g. age of the claimant).
- Will thus need to have a sense of the eligibility criteria and the proportion of cases likely to benefit.
- Will then need to estimate the new claim termination rates for these cases. Likely that clinicians and those advocating the program will overstate the potential savings.
- Will not have historical data available.
- May be more suitable to use case estimates to adjust the reserves for claims that have been reported
- An experienced claims manager can adjust the case estimate to allow for the likely impact of rehab.
- The question is not clear whether the change is intended for statutory reserves or for management accounts so need to consider any regulations around how statutory reserves are calculated, and ensure that calculation of reserves is consistent.
- Will need to consider whether it is prudent to adjust assumptions without evidence of savings.

END OF EXAMINERS' REPORT