

EXAMINERS' REPORT

November 2012 examinations

Subject F101 — Health & 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

Many candidates stated incorrectly that worksite marketing is a distribution channel. This is actually a distribution strategy that theoretically could be performed by any of the four distribution channels stated below. There were also a number of candidates that mentioned tied agents sell products from a number of insurers without explicitly qualifying that, if this is the case, they are usually complementary and not overlapping.

For part (ii) if a list of theoretical points were provided that were not linked to the context of the question, no marks were awarded.

1. Independent Financial Advisors

Adv:

- Knowledge & professionalism should be high which means the customers get good explanations especially on a complex product such as CI
- No infrastructure cost to insurer
- Only pay them for what they sell
- They have more experience in the market and will be able to market to their existing base which would be useful to the insurer

Disadv:

- Paid commission upfront which is a financing burden for the company
- No control over their sales approach/ 'mis-selling risk'
- Will be competing against other companies for the IFAs sales
- Price competitive
- High churn very likely

2. Tied Agents

Adv:

- Under insurance companies control
- Only sell the insurers products / Non-competitive

Disadv:

- Will require some support from the insurer
- Need to be trained by the insurer

3. Own salesforce

Adv:

- Even more under the insurance companies control than tied agent
- Should provide better quality sales with lower churn

Disadv:

- Usually salaried or part-salaried which might be a disincentive to sell
- Will require training and management by insurer
- Cost of setting up own sales force can be high
- New company so don't have existing relationships to difficult to sell to people already in insurance market

4. Direct

Adv:

- No commission payable so theoretically cheaper

Disadv:

- Need some form of database to market to
- Not targeted
- Lapses are generally much higher
- Easier to sell less complex products through this channel and CI is relatively complex and the definitions may need explaining which isn't easy in a direct sales environment

(ii)

- Salary is difficult to define uniformly across all employers
- Eg does it include variable allowances and commission?
- Extra administration arising from job movements
- How is it defined for self employed
- Insurable interest for critical illness cover is not necessarily linked to salary
- Can be medical expenses which are not salary dependent
- Can be linked to loans
- Can be for lifestyle adjustment (also not linked to salary)
- Or just for compensatory purposes
- Salary information needs to be verified (eg tax returns)
- Can have multiple salary sources
- There may also be an issue with multiple policies – would need to check aggregation
- Collecting salary information may delay the sales process

Question 2

In general part (i) and (ii) were answered reasonably well. Part (iii) and part (iv) were poorer - in part (iii) candidates did not write enough to get 6 marks, in part (iv) many candidates glossed over how the number of payment runs would actually effect the reserving.

- (i) Unearned Premium Reserve – the balance of premiums received in respect of periods of cover not yet expired – important if premiums are annual and not monthly
Unexpired Risk Reserve – in respect of UPR where it is felt that the premium basis is inadequate
Outstanding claims reserve – claims notified but not yet settled (or not yet fully settled)
Incurred but not reported – arisen but not yet notified
Incurred but not enough reported
Equalisation/catastrophe reserves – if the current year is considered to be atypical
Claims in transit – claims reported but not assessed
Mismatching reserve – if assets and liabilities are mismatched
Statutory solvency requirement – may be a requirement to hold a reserve over and above the items listed separately.

No marks were given for merely listing the types of reserves.

(ii) Possible reasons for fluctuations:

- Methods used to calculate reserves (for example B-F more stable than BCL)
- Inconsistent number of payment runs not accounted for in the method
- Change in basis
- Data errors e.g. the incorrect recording of a claim amount
- Data omissions e.g. due to processing delays
- Data distortions such as:
 - External influences such as inflation, claiming behaviour
 - Internal influences such as changes in processes
 - Changes in the type of business sold such as changes in volume/mix, demographic changes, product design changes
 - Random fluctuations or large claims (will be exacerbated if the risk pool is small)

Checks:

- Data checks (quality, credibility, grouping)
- Checking model and testing alternative methods
- Backtesting model - Comparison of previous estimates with actual experience
- Checking for outliers
- Qualitative checks on processes
- Check estimates against previous estimates

Note: the question wording was changed to include the words “short term and long term”. This opened up the question beyond the original solution without any adjustment to the mark allocation.

No marks were given for mentioning claims seasonality without sufficient explanation – this would only cause fluctuations in reserves if not allowed for appropriately, or if seasonality patterns have changed.

(iii) The chain ladder method uses development ratios weighted by the cumulative claims values. The basic chain ladder applies to unadjusted paid claims using a treatment cohort whilst the inflation adjusted method applies an inflation index to past claims to bring them in line with the latest year and to projected claims to the expected year of payment.

The Bornhuetter-Ferguson method combines the estimated loss ratio with a projected method (like the basic chain ladder). Adds stability. Makes use of additional information. This method is based on a Bayesian approach, and is based on the principle is that the past development for a given origin year does not necessarily provide more information for future claims than the loss ratio. Will be influenced by the choice of loss ratio.

(iv) Method is very sensitive to the amount of claims paid in development month 0. Where there are weekly pay runs there will be some months with 4 runs and some with 5 runs. The total claims in a 5 payment month will be higher (more time to

process claims) – without adjustment the reserve will be higher because of this.

The estimate would “correct” with an additional months data – this could account for the variability observed.

Question 3

The question was well answered. Many candidates did not adequately distinguish their responses to part (i) and part (ii) in that part (i) required a general approach while part (ii) was more applied to the case study. Part (iii) was a numerical answer and candidates that worked logically through the layers of cover performed well.

(i)

- They may be launching a **new product** which they don't have any experience in.
- They may require access to the reinsurer's **expertise**, actuarial, claims, or underwriting.
- They may be thinking about launching a product in an **overseas** country, and need international experience.
- They may have had a few very large claims, and need reinsurance to **smooth the results**
- They may be testing out the reinsurance market to see if they can get **cheaper risk rates**.
- There may be **regulatory arbitrage** reasons why it makes sense to reinsure.
- There may be **tax** reasons why it makes sense to reinsure.
- They may be in need of capital want to assess the option of **financial reinsurance**.
- They may be concerned about a one off **catastrophe** impacting their results.

There may be some other answers, but they must be justified.

(ii)

The answer for this is very much “it depends”. The student needs to show that different types of reinsurance are relevant for different reasons. The student can't just say “surplus because they are a large company”. The answers to (b) should tie up to the reasons in (a).

Expertise, new product, overseas product

- Could either be quota share or surplus. They would need to provide the reinsurer with enough premiums to justify getting the service.

Cost

- If the reinsurance is “cheap”, then could choose quota share or surplus, depending how much risk the insurer wants to keep.
- It is also possible for the quota share rates to be cheap, and surplus to be expensive, or visa versa.

Smooth results

- Surplus or individual excess of loss.

Regulatory arbitrage and tax

- Probably quota share, but could be surplus.

Catastrophe

- Catastrophe reinsurance.

Financial reinsurance

- Would usually be quota share. You need a high volume of premium.

(iii)

The candidate should show their workings, broken up into each stage. Workings are necessary for full marks. Insurer pays R96m. Reinsurer R94m. Workings in table below.

Claims	Cost of claim	Insurer per claim	Reinsurer per claim	Insurer total	Reinsurer total	Total
30	1,000,000	900,000	100,000	27,000,000	3,000,000	30,000,000
30	2,000,000	1,800,000	200,000	54,000,000	6,000,000	60,000,000
20	3,000,000	2,000,000	1,000,000	40,000,000	20,000,000	60,000,000
10	4,000,000	2,000,000	2,000,000	20,000,000	20,000,000	40,000,000
Total claims before cat cover				141,000,000	49,000,000	190,000,000
catastrophe xs point				50,000,000		
potential cat claim				91,000,000		
but capped at				50,000,000		
insurer pays 10% in layer, reinsurer the rest				5,000,000	45,000,000	
insurer pays retained cover in excess of cat capacity				41,000,000		
insurer also has to cover first R50m				50,000,000		
				96,000,000	94,000,000	190,000,000

Question 4

Part (i) - Most candidates did not answer the question based on the information provided and missed the primary points about the impact of the regulation. The second part of the question about the impact on price was answered better than the first part, however for this candidates focused too much on sourcing data rather than the price impact itself. A number of candidates also attempted to localise the question hence making conclusions or comparisons that were not relevant.

Part (ii) - Candidates generally did well for this question providing a range of relevant management approaches for these benefits. Marks were not given for suggestions stemming from the insurance environment such as no claim discounts and exclusions.

(i)

- Effect of product:
 - The minimum benefits are all out of hospital care
 - Currently covered through the savings account
 - Will need now need to cover some out of hospital treatment from “risk” benefits
 - Eligibility for post traumatic events needs to be defined (i.e. what type of events)
 - Ante-natal care needs to be defined as number of visits and scans (i.e. protocol)
 - Will increase the cost of the product
 - Benefits will previously have been paid from savings so more savings available for other benefits
- Pricing
 - Use existing claims data for
 - Incidence of traumatic events (admissions)
 - Incidence of maternity cases (admissions)
 - Counselling paid from savings
 - Ante-natal paid from savings
 - Dental paid from savings
 - Need assumptions for increased utilisation especially dental
 - Price the treatment plan for ante-natal care
 - Can also price the treatment plan for post traumatic counselling
 - Combine incidence and price

(ii)

Manage costs

- Use preferred providers
- Agreed tariffs and protocols
- Definition of benefits
 - Number of sessions by type of event
 - Number of visits and scans
 - Codes for dental claims
- Pre-authorisation – can add expense so need to ensure cost is justified

Question 5

Part (i) - Candidates that did well in this question recognised that the insurer already has some of the data that could be used for pricing and directly explored how this could be used in conjunction with other data. Most candidates however assumed that no data was available internally and produced lists of data sources which were often generic in nature, thus scoring very low marks. In particular, many candidates failed to state the obvious with respect to the information given in the question which specified the characteristics of the product.

Part (ii) - This question was generally well answered with candidates generating a significant amount of points on benefit structure and pricing that were relevant to the products at hand. Candidates that did poorly for this question did not focus on the benefit structure implications.

Part (iii) - Candidates generally did well in this question. Better answers elaborated on the characteristics of both the existing product and the new product and how the investment strategy would differ, while also noting the impact of the differences.

(i)

- PMI insurer will have data on medical treatment
- May not have data on need for custodial care
- For LTC element may need to look at other sources
- Such as industry data
- Published tables
- Information from care providers on their costs
- Or approach a reinsurer for assistance
- For Recuperation benefit can look at incidence of large health events in own data
- Should have enough volume for risk factors such as age and gender
- Need definition for what large event is

(ii)

Benefit structure

- Prefunded element needs eligibility definition
- Needs to be communicated to policyholders to manage expectations
- Will cover increase if severity of condition increases?
- Will cover be provided at specific facilities? Licensing requirements
- Other benefits can include: Durable medical equipment, home modifications, respite care, caregiver training
- For recuperative element large health event needs to be defined
- can defined amount per day be selected by policyholder?
- could be linked to income
- could include additional benefits for treatment like physiotherapy
- may sell on a unit-linked basis
- reduces risk of selective lapsation but increases costs

Assumptions required

- Transitional factors for care (initial)
- And to higher levels of care
- Cost of care per state
- Inflation in cost of care

- Incidence of large health events
- Cost of any recuperative treatment
- Inflation for benefit
- Initial expenses for underwriting and policy inception
- Policy management expenses
- Claim underwriting expenses
- Claim payment expenses
- Commission
- Overhead expenses
- Investment returns – linked to investment strategy
- Tax treatment of investments, proceeds, premiums

(iii)

- PMI insurer likely to have short-term time horizon
- depending on level of free assets
- key issue is liquidity
- so weighting towards cash and fixed interest investments
- for new product there is longer term element
- but also need for liquidity for recuperative benefits
- likely to have greater exposure to longer-term asset classes
- such as equity and property
- cashflow model can be used to determine an optimal investment strategy
- need to consider cost of different asset classes (justified by additional return?)

Question 6

Candidates needed to apply some common-sense principles to answering this question and many attempted to over-complicate the requirements.

- (i) Incidence refers to new cases of a disease, while prevalence refers to existing cases of a disease:

Incidence rate = # new cases/population

Point prevalence = # of existing cases/population

- (ii) Incidence rate = $173,770/292,287,454 = 5.95 \times 10^{-4} = 5.95$ in 10,000
Credit was given for calculations using an at-risk population (older than 40)

- (iii) Mortality rate = $160,440/292,287,454 = 5.49 \times 10^{-4} = 5.49$ in 10,000

- Mortality rate is high
- It is most often diagnosed in a very advanced (metastatic) state.
- Although early lung cancer is treatable,
- there are no good treatments for advanced lung cancer.

- (iv) Population over 40 = 48% x 292m = 140 160 000
(140,160,000) x (\$100) = \$14,160,000,000 = \$14.2 billion

Without: $173,770(.92)/292,000,000 = 5.47 \times 10^{-4} = 5.47$ in 10,000

With: $173,770(.15)/292,000,000 = 8.92 \times 10^{-5} = 8.92$ in 100,000

number of lives saved ($5.47 \times 10^{-4} - 8.92 \times 10^{-5}$) * 292 million = 0.133 million

number of years of life saved is number of lives saved * 18 = 2.4 million

So cost per life year saved = \$5 900

(v)

- Cost of underwriting needs to be justified by potential saving on lower claims
- so need to filter out cases where risk is low
- not likely to apply to applicants under 40
- may need to consider other risk factors for test to be a requirement
- for example smoker status, family history, PMA report
- need to determine sum assured level where test is required
- using a cost optimisation technique
- Ethical issue is that applicant may not know that they have risk and then get excluded
- Could exclude for critical illness benefit but still cover death if they are treated