2019 PART III EXAMINATIONS

Subject Title: C2A Life Insurance

Date: Friday, 26th April 2019

Time: 10:00am – 10:15am
(Planning Time)

10:15am- 1:15pm
(Examination)

Time allowed: Three (3) hours and fifteen (15) minutes including planning time.

Instructions: Type your answers to the questions using Microsoft Word and ensure that there are no links to spreadsheets.

In your answers, include your candidate number in the header and footer on each page of the document.

You must submit your Excel answer file(s) and save your work regularly.

Number of Questions: Three (3)

Question	Marks
1	30
2	30
3	30
Total	90

Candidates are required to answer ALL questions. This paper has **NINE** (9) pages (including this page).

MK

QUESTION 1 (30 Marks)

You are a product actuary at Close Call Life Insurance ('CCLI'). CCLI manages a portfolio of life insurance investment-linked business.

CCLI uses a 'forward-pricing' approach; applications to buy and sell units are exercised based on unit prices which are calculated at the end of the day the application is made. The alternative is a 'backward-pricing' or 'historic' approach, where the buy/sell prices are specified before the application is made (e.g. based on the previous day's closing price).

a) Suggest reasons why CCLI may have chosen a forward-pricing approach compared to a backward or historic pricing approach. **(2 marks)**

Today is the 26th April 2019. CCLI have just discovered three-unit pricing errors:

1) An error in the calculation of the expense provision meant the day-end Net Asset Value (NAV) on 8-April 2019 was overstated by $10m.

2) On 11-April 2019, a cashflow which was manually keyed into the administration system was entered incorrectly causing the Net Asset Value to be understated by $12m.

3) A system glitch on 16-April 2019 meant that customers withdrawing units on that day did so at the previous day's closing unit price.

As these errors have just been discovered, none of them have been corrected. In all cases, the errors were carried forward into subsequent NAV and unit pricing calculations.

CCLI intends to rectify these issues in line with its approach for previous errors:

- Customers will be restored to the position they would have been in, had the error not occurred.
- Cash payments (restitutions) will be made to customers who withdrew money from their accounts and were disadvantaged by the errors. Along with the restitution amount, interest will be included, at a rate of 8% p.a. (i.e. approximately 0.02% per day) from the date that the error first occurred.
- CCLI will not seek to recover money from customers who withdrew from the fund and were advantaged by an error.

A spreadsheet ***(C2A_Sem_1_2019_Questions_CCLI Pricing Error.xlsx)*** has been provided which shows NAV and unit movements from 3-April 2019 until 26-April 2019.

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In completing this question, you should assume that:

1) Members would have **purchased the same dollar amount** regardless of errors,
2) Members would have **withdrawn the same number of units** regardless of errors,
3) The assets / reserves not reflected correctly in the NAV have earned the same daily investment return rates as the remainder of the portfolio,
4) CCLI uses a fixed buy spread but has no sell spread or transaction costs,
5) Restitutions will be paid on 26-April 2019, and;
6) You can ignore tax in answering this question.

Note:
The spreadsheet associated with this question contains two sheets:

Data: *Where the data needed for the question is located*

Cells shaded yellow are only shown as values (the formulae for their derivation have been removed).

To answer the question and receive full marks, you will need to derive/ recreate the formulae for these cells and/or state how you would do so.

You may assume that all other cells / formulae are free of errors and do not need to be recreated or amended to answer the question.

***Template**:* *Contains the required layout for your answers.*
Once completed, candidates are required to copy and paste this sheet into your Word answer document

As candidates are required to show all working and state any assumptions made, the calculations spreadsheet must also be submitted with your Word answer document.

To assist with identifying the stages of the working related to each part of the question, candidates are asked to make a copy of their Data/working sheet by using "Move or Copy…" (right click on the tab) after each data correction has been made.

b) Calculate what the restated unit prices between 3-April and 26-April (inclusive) would be after the errors are rectified in line with CCLI's stated approach above. **(10 marks)**

c) Calculate what the cost of the errors would be to CCLI. Your answer should show all working and should include each of the following items:

i. The amount CCLI would need to pay in restitutions (including interest) to customers that withdrew funds. **(2 marks)**
ii. The total cost to CCLI of paying restitutions and reimbursing the fund for withdrawal overpayments and lost investment returns. **(3 marks)**
iii. A breakdown of Q1(c)(ii) that shows the incremental cost of each error. **(3 marks)**

CCLI has an operational risk Incident Register to capture errors like those identified as having occurred recently. The Incident Register breaks operational risk related incidents down into specific categories (fraud risk, product risk, system / IT risks, business disruption, people risks, process risks, etc.). It includes details about how the incident occurred and what actions should be taken to minimise the potential for future impacts arising from similar issues. You've been asked to enter the three-unit pricing errors into the Incident Register.

d) For each of the three incidents, categorise them into one or more of the operational risk categories in the Incident Register. Then, suggest ways that CCLI could mitigate, minimise, or avoid such errors in the future. **(7 marks)**

e) A product manager working at CCLI has questioned why CCLI doesn't attempt to recover funds from advantaged customers following errors. Provide reasons why. **(3 marks)**

END OF QUESTION 1

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QUESTION 2 (30 Marks)

Note: There is no accompanying spreadsheet for this question.

You are the chief pricing officer working at Simply Life Insurance Ltd. ('SLI'), a life insurer operating in Australia.

SLI is a relatively new company to the market which offers a simple, non-intermediated Yearly Renewable Term ('YRT') Death only product and a funeral insurance product. Customers are able to purchase online or over the phone, with both methods providing no-advice product information and the opportunity for customers to have any questions answered. SLI uses a range of focused advertising on day-time television and radio to generate awareness of both ways to purchase their products.

To make the purchasing process as quick and straightforward as possible, SLI avoids detailed underwriting. To achieve this, the sales process employs a short-form underwriting approach (i.e. five simple yes/no questions rather than collecting a detailed medical history). They also restrict sum insured to a maximum amount per age and include a Pre-Existing Condition Exclusion ('PECE') amongst other product terms and conditions.

The CEO has approached you with a desire to expand the product line to include a Trauma / Critical Illness product. In an email to you, they noted:

"Trauma is popular in the retail market, but it's too complicated. There are too many claimable conditions included nowadays and it's becoming overly costly and confusing for the average customer.

A little bit of research suggests that more than half of all trauma claims are related to cancer. I believe that a cut-down trauma product which pays only on cancer alone and is provided as an acceleration rider to our Death only product would meet most customers' needs and be way more affordable."

a) In the context of the Australian market, explain what customer needs a Trauma / Critical Illness product is designed to meet. **(2 marks)**

b) The FSC's Life Insurance Code of Practice provides a set of minimum standard medical definitions for cancer, heart attack, and stroke – but there is still a lack of consistency in terms of the exact definition of what is and what isn't covered by Trauma products across the major life insurers in Australia. In some other countries (e.g. the UK) critical illness definitions are standardised across all life insurers such that there is little difference between coverage offered by different life insurers.

Provide pros and cons for both the "minimum requirements" and "standardised definitions" approach from a customer's perspective. **(5 marks)**

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c) Compare how SLI's direct-sales approach would differ to an advice-sold product in terms of selling a Trauma-style product:

i. What questions asked during the sale / underwriting of advice-sold Trauma products are unlikely to be asked currently by SLI? Why are these important? **(3 marks)**

ii. How would the approach to underwriting differ, both medically and financially? **(3 marks)**

iii. How does commission / sales remuneration generally differ between these channels? How might this impact on SLI's lapse experience compared to an advice-sold Trauma product? **(3 marks)**

d) Do you agree that the product the CEO is suggesting will be more affordable and better meet customer's needs than the average retail product for SLI's customers? Provide reasons why / why not. **(6 marks)**

e) The CEO expressed an interest in understanding the risks to SLI of launching this product, specifically related to its cancer-only approach. Write a memo to the CEO listing the risks. For each risk, provide a possible mitigation. **(8 marks)**

END OF QUESTION 2

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QUESTION 3 (30 Marks)

Note: There is no accompanying spreadsheet for this question.

You are a pricing actuary at LotsaLife Ltd, a medium-sized Australian life insurer. LotsaLife has two main portfolios of business:

1) A Group division which predominantly insures corporate schemes, but does include a small number of medium-sized industry superannuation schemes, and;

2) A legacy book of retail insurance business which is closed to new business.

LotsaLife are currently participating in a tender for BigOne Super (an industry superannuation scheme). The tender covers BigOne's Death and TPD insurance offering. BigOne's product design is typical of an industry superannuation scheme in that premium rates are expressed per unit of cover, with a sum insured scale dictating the sum insured provided by each unit of cover. Both premium rates and the sum insured scale differ by member age.

The scheme is around 10 times larger (in terms of claims and members) than the largest scheme in LotsaLife's current portfolio. The client is requesting a quote, based on their current product design, with pricing expressed as a multiple of the current premium rate shape (e.g. a flat x% increase in rates).

a) List three key pieces of data / information you would expect to receive in the Request for Proposal ('RFP') document or attachments that you would need to be able to price the scheme. Briefly explain why this information is important. **(3 marks)**

LotsaLife has a standard process for quoting on corporate schemes. It involves estimating expected claims for the new scheme based on a standard incidence rate table multiplied by an uplift factor that reflects the scheme's credibility-weighted historical experience. The rates in the incidence table are derived from the experience of LotsaLife's current inforce portfolio of corporate superannuation schemes, and provide rates based on a member's age, gender, and their occupation (grouped into four main classes).

b) Do you think Lotsalife's standard pricing process as described above will be appropriate for the BigOne quote? Why / why not? **(3 marks)**

c) List changes or amendments to the standard process that you would suggest making in this case. **(3 marks)**

Three years ago (on 1st April 2016), BigOne's premium rate and sum insured scale was adjusted alongside other changes to the product terms and conditions, including the wording of the TPD definition. The scale and rate changes differed by age, such that at certain ages default cover reduced and at other ages it increased.

Members who were in force at the time the changes were implemented had their units of cover adjusted to ensure their sum insured did not decrease upon implementation of the new scale.

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Note:
To analyse claims experience over time for a scheme that has had changes in its benefit design, you need to 'rescale' the historical experience. That is, you need to adjust the historical claims and premiums amounts to estimate what would have been paid if the current product design had applied at that time.

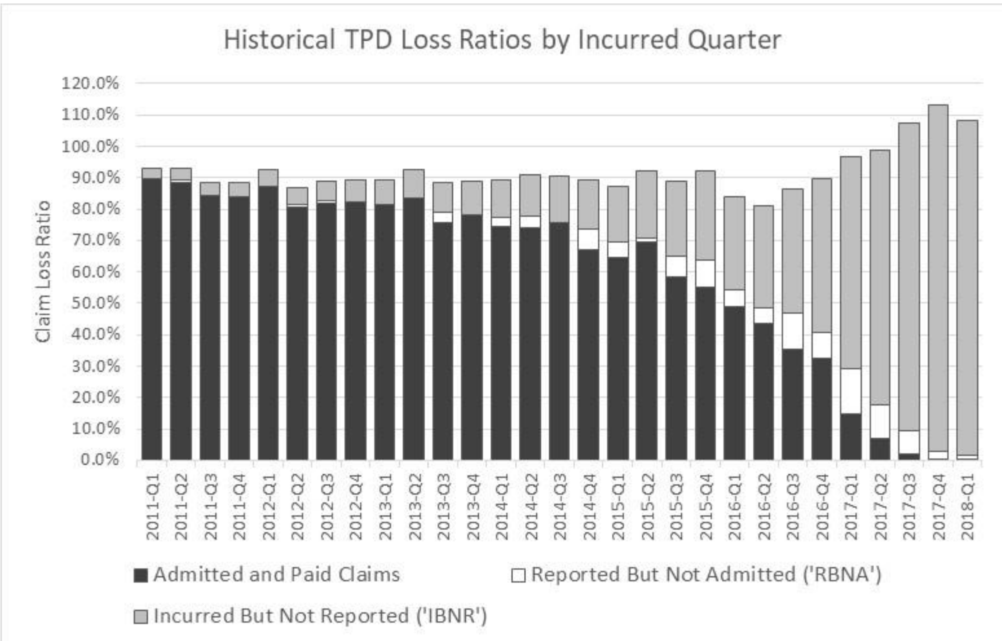
d) Describe the steps you would take to rescale the premiums paid over the history of the scheme. That is, how you would go about estimating the total annual premium the scheme would have paid in each of the years prior to 2016 had the post-April 2016 design been applicable.

Assume that you have the old and new premium and sum insured rates available for this exercise, as well as a detailed list of members that were in force for each year you want to estimate this for.

Note any sense checks you might perform as part of this process to ensure that the output is reasonable. **(4 marks)**

You've just finished analysing the scheme's historical experience and have produced a graph of the claim loss ratios over the last 7 years. For this exercise, you've based all of the assumptions off the scheme's historical experience without adjustment for product, sum insured, or premium changes (i.e. before rescaling). A simple chain ladder methodology was used to estimate incurred but not reported (IBNR) reserves using all available claim data.

The TPD loss ratio graph is shown below:



As the graph shows, a trend in loss ratios appears to have emerged in recent years.

e) Provide a list of reasons why you might be seeing this trend emerge. **(4 marks)**

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f) For each of the reasons you provided in Question 3 (e), suggest how you would investigate and confirm/rule out these potential causes. **(7 marks)**

The Head of Marketing comes to see you about the scheme. They are very keen to win the business given how large it is compared to the remainder of the portfolio.

They have suggested that you price the scheme on a marginal expense basis. That is, that you should only include the additional expenses incurred in taking on the scheme rather than including an allowance for overheads and fixed expenses already incurred by the company as you would do for other schemes.

g) List the likely main sources of marginal expense for the BigOne quote. **(2 marks)**

h) Provide arguments for and against the approach suggested by the Head of Marketing. **(4 marks)**

END OF QUESTION 3

END OF EXAMINATION

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