2018 PART III EXAMINATIONS

Subject Title: C2A Life Insurance

Date: Wednesday, 10 October 2018

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).

CJW AB

QUESTION 1 (30 Marks)

There is no spreadsheet accompanying this question.

CafeSuper is an industry superannuation fund which operates in Australia. The fund's key market is employees of the food and beverage industry, in particular café and restaurant workers.

Approximately 3,000 new accounts are opened each year, although just as many accounts closed. As a result, total membership has been steady at approximately 100,000 members for the last 5 years. Total funds under management is currently $0.6bn.

Default Death, Terminal Illness and Total & Permanent Disablement (TPD) cover is provided to all members on an opt-out basis. A summary of the insurance portfolio and product design is provided below:

<table>
<tr><td>1</td><td>Premium Rate</td><td>$1.00 per unit per week for all members</td></tr>
<tr><td>2</td><td>Default Cover</td><td>4 units of cover</td></tr>
<tr><td>3</td><td>Automatic Acceptance Limit ('AAL')</td><td>4 units of cover</td></tr>
<tr><td>4</td><td>Sum Insured</td><td>1 unit of cover provides Death and TPD cover as per the scale below:
<table>
<tr><th>Age Last Birthday</th><th>Death</th><th>TPD</th></tr>
<tr><td>< 35</td><td>$ 50,000</td><td>$ 50,000</td></tr>
<tr><td>35 – 39</td><td>$ 40,000</td><td>$ 40,000</td></tr>
<tr><td>40 – 44</td><td>$ 32,000</td><td>$ 32,000</td></tr>
<tr><td>45 – 49</td><td>$ 25,000</td><td>$ 25,000</td></tr>
<tr><td>50 – 54</td><td>$ 18,000</td><td>$ 18,000</td></tr>
<tr><td>55 – 59</td><td>$ 10,000</td><td>$ 10,000</td></tr>
<tr><td>60 – 64</td><td>$ 5,000</td><td>$ 5,000</td></tr>
<tr><td>65 – 69</td><td>$ 5,000</td><td>Nil</td></tr>
</table></td></tr>
<tr><td>5</td><td>Eligibility</td><td>Cover automatically commences for a member when their employer first makes a Superannuation Guarantee ('SG') contribution into the member's account.</td></tr>
<tr><td>6</td><td>TPD Definition</td><td>The TPD definition requires that the member is permanently incapacitated due to ill-health (whether physical or mental) such that the member will be unlikely to engage in gainful employment for which the member is reasonably qualified by education, training or experience.</td></tr>
<tr><td>7</td><td>Expected Claim Loss Ratio</td><td>85%</td></tr>
<tr><td>8</td><td>Average Age (last birthday)</td><td>Average age of membership = 30
Average age at claim = 45</td></tr>
</table>

CJW AB

a) Based on the information provided, estimate the following:

i) Current in force annual premium. **(1 mark)**

ii) The total number and amount ($) of claims incurred per year. **(3 marks)**

State any assumptions made and explain your working.

b) Given the nature of the fund's membership and eligibility requirements, describe what other terms or conditions you would expect to see included within or used in conjunction with CafeSuper's TPD definition. **(3 marks)**

c) In terms of the premium, sum insured, and default cover structure as summarised above:

i) Identify and explain any other issues you can see with CafeSuper's design from either an insurer's or a member's perspective. **(6 marks)**

ii) Suggest amendments that would mitigate the issues you have identified. For each amendment, comment on the impact your suggestion may have on members of the fund. **(4 marks)**

Note: You may suggest multiple amendments / impacts for a given issue.

CafeSuper regularly checks for duplicate accounts and sends regular communications to all members and employers about account balances and the need for members to review their insurance cover. Despite this, however, the trustee is concerned that insurance premiums are eroding the accounts of inactive members and those with low salaries.

CafeSuper's current premium guarantee period is due to expire in 6 months and the trustee is considering changing the eligibility criteria such that:

- Only members with account balances over $6,000 will be automatically provided insurance cover.
- New members joining the fund can request within 90 days of joining for their default cover to commence immediately or on the receipt of their first SG contribution, otherwise they would be automatically provided cover once their account balance reaches $6,000.
- Any member whose account balance falls below $6,000 would have their cover automatically removed unless the member confirms they want to keep it.
- The existing AAL would remain in place.

d) For each of the following items, explain what the impact of the changes above might be on:

i) In force premium immediately after the change. **(1.5 marks)**
ii) In force premium 1 year after the change. **(1.5 marks)**
iii) Claim loss ratios. **(3 marks)**
iv) Premium rates. **(1 mark)**

Include estimates of the impact along with your explanation for answers (i) and (ii).

CJW AB

You are a product actuary within an Australian life insurer that writes group risk business and is tendering for the insurance of the CafeSuper scheme. The request for tender document from CafeSuper has asked life insurers to comment in their submissions on their proposed changes to the eligibility criteria listed above.

e) The manager preparing your company's tender submission has asked you to assist with the section dealing with the proposed changes. Write a memo to the manager addressing the following items:

i) A list of risks that the trustee should be aware of in implementing the changes. **(3 marks)**

ii) Your view on whether the proposed changes will materially improve the issue of erosion of account balances for CafeSuper's members. **(2 marks)**

iii) Suggest alterative terms or changes that could reduce the risks in the list provided to the trustee and/or better address the erosion of balances. **(1 mark)**

END OF QUESTION 1

CJW AB

QUESTION 2 (30 Marks)

You are a pricing actuary working at the Happy Reinsurance Co (HRC), a life reinsurance company with a registered office in Australia. HRC's primary focus is on income protection insurance sold through financial advisers (i.e. Retail IP).

You have been approached by BankInsure, a bank-owned insurer, to reinsure their IP portfolio.

Unlike your other clients, BankInsure's products are general advice products sold by bank staff with no personal advice provided. The products also have minimal underwriting. They are upsold to customers entering into short-term (3-5 years) personal loans.

The policies are designed to suit BankInsure's personal loan portfolio:

- Policyholders can insure up to 80% of their salary at the time of sale.
- The policies are 'Agreed Value' in nature; the full monthly benefit is payable net of other income received while on claim.
- The benefit period is linked to the personal loan period. Policies cease when the loan is paid off or the account closes (any open claims will continue until the life insured is no longer disabled or the benefit period ends).
- Three years ago, an additional feature called the 'Loan Closure Benefit' was added to the policy. The Loan Closure Benefit pays an additional amount equal to 3 months of benefits if the claimant still meets the disability definition at the end of the benefit period. The benefit was added at no extra cost to all policies (both new and existing).

BankInsure have requested HRC to provide a quote on a surplus reinsurance arrangement with a retention of $2.5k per month.

Lacking any experience for direct-sold business, you have decided to price the business by starting with the standard pricing assumptions you use when pricing retail IP products.

a) Explain the difference between medical and financial underwriting and how each is used to mitigate risk in selling IP cover. **(2 marks)**

b) List the product terms, underwriting, or other protections you would expect BankInsure to be implementing in selling its direct-sold IP product. **(3 marks)**

c) Suggest reasons why BankInsure may be seeking reinsurance for this portfolio. **(2 marks)**

d) For each of the following items, describe the adjustments you might need to make to your existing retail assumptions before applying them for this quote:

i) Lapse assumptions. **(2 marks)**
ii) Claim incidence rate assumptions. **(4 marks)**

CJW AB

BankInsure have provided some data on their termination experience to help you develop your reinsurance quote.

A junior analyst in your team has cleaned the data and performed some analysis on it. They have saved this in the attached spreadsheet '***C2A_Sem_2_2018_Termination_Analysis_2012_2017.xlsx***'.

NOTE:

The spreadsheet has three tabs:

- *The 'Analysis' tab includes a cleaned copy of the termination data (columns A:J) and the analysis conducted by the junior analyst (columns K:AQ).*
- *The 'Data Dictionary' tab provides a description of the data on the 'Analysis' tab.*
- *The 'Example Submission' tab provides the standard retail basis (cells B4:C13) along with the analyst's proposed assumptions (cells D4:D13 and H4).*

You can assume that the underlying claim data and the formulae written by the junior analyst have been tech reviewed and are free of errors. However, the analyst is inexperienced, so you should peer review their approach and make amendments as necessary.

It may be helpful to note that the 'Analysis' tab has a column called 'Claim Count' (column K). This is referenced by all summary calculations throughout that tab. You can remove individual claims from the analysis by setting the value in this column to 0, or reduce the weighting on these claims by setting a value between 0 and 1.

Based on this analysis, they have concluded that your standard retail termination rate basis is a surprisingly good fit for the portfolio. As such, they've proposed that you base your reinsurance quote on the following assumptions:

- Termination rates = standard Retail IP basis (table below)

Months since Disability	Retail IP Basis (termination rate per month)
1	0.0%
2	20.0%
3	15.0%
4	10.0%
5	9.0%
6-11	7.5%
12-17	5.0%
18-23	4.0%
24+	3.0%

- Payment ratio = 75% of monthly benefit for all claims

  The 'payment ratio' is defined as the proportion of sum insured that is actually paid (i.e. payment ratio = 1 – offset ratio). The actual paid amount in this case can be lower than the sum insured due to partial disability, statutory offsets, or similar items.

CJW AB

Perform your own analysis of the termination and payment ratio experience, then:

e) Propose a termination rate and offset assumption that HRC should use for the BankInsure quote. **(2 marks)**

HRC's pricing model can only project termination rates and payment ratios that are multiples of the standard basis. As such, your submission must be in the format specified on the 'Example Submission' tab; termination rates can be multiples of the basis split by months since disability, and the payment ratio must be a flat assumption for all claims.

Put your proposed assumptions in the yellow cells and copy this into your submitted word document. You should also submit your spreadsheet, inclusive of any working that you did, along with your word document.

f) Justify your proposals based on the analysis you conducted. Where relevant, comment on the experience (e.g. suggest potential reasons for observed experience). **(10 marks)**

g) Suggest other analysis (specific to incidence, termination, or partial payment experience) that HRC should conduct before pricing this business. You should explain why the additional analysis is important and what data you would need to be provided to conduct this analysis. **(5 marks)**

END OF QUESTION 2

CJW AB

QUESTION 3 (30 Marks)

There is no accompanying spreadsheet for this question.

The Australian government is interested in building a retirement income system. Rather than rely on the aged pension, they want individuals to seek protection against longevity risks, and want to ensure that retirees have sufficient options available to them to enable this.

You are a consulting actuary with experience in longevity markets outside of Australia. You have been approached by a client looking to develop a lifetime immediate annuity product for members of a large retail superannuation fund.

The client has proposed the following high-level design:

- Single upfront premium based on age and gender.
- A discounted premium is offered to members that use at least 60% of their super balance or $500,000 (whichever is lower) to fund the annuity.
- Benefits are paid until the death of the life insured.
- Monthly payments indexed annually at CPI (subject to a maximum of 7% p.a.)
- Upon death, a lump sum payment is made to the life insured's estate. The payment is equal to (50% of initial premium) less (total payments made over the policy). If this is negative, no benefit is paid.
- The annuity can be cancelled – either partially or fully – at any time. Upon cancellation, a lump sum payment equal to 80% of the applicable Death benefit is paid. This provides an option to withdraw lump sum amounts from the annuity over time if necessary.

The intention is for members to sign up for the product via the super fund's online portal. Direct telemarketing will be used to encourage members close to retirement to sign up for the product. Telemarketers will be remunerated via salary but will have bonuses linked to the volume of successful referrals.

a) Explain the roles of ASIC, APRA, and the ACCC in regards to regulating this product. Suggest areas of concern each would have. **(3 marks)**

b) Suggest a high-level investment mix (i.e. % of total assets held for each asset type) that would be suitable for this product. Explain why this mix is appropriate for the specific liability risks this product faces. **(4 marks)**

c) Evaluate the product from a new business perspective.

i) Identify the needs for the customer that this product is targeted at. Does the policy meet these needs? **(4 marks)**

ii) What issues do you see with the distribution model for this product? **(3 marks)**

iii) In your opinion, will there be a high take up for this product? Why? **(2 marks)**

CJW AB

d) Describe the process you would take when pricing this product. Your answer should include:

i) The key assumptions required for pricing, including why the assumptions are important for this product specifically. **(4 marks)**

ii) What measure of profitability would you use when pricing this product and why? **(2 marks)**

iii) How you would determine the discount to offer to members who use over 60% of their super balance / $500k to fund the annuity. **(3 marks)**

You have been asked to comment on how expense assumptions would be derived for the product. The list of cost centres is provided below:

1	Call Centre
2	Sales & Marketing
3	Policy Administration
4	Claims Management
5	Finance and Actuarial
6	Client Services
7	Investment Management
8	IT and System Costs
9	Other Overheads (General Management, Rent, etc.)
10	Product Development Costs

e) Outline how you would incorporate the expenses into your pricing. Your answer should include:

i) How you would categorise the expenses in your analysis. **(3 marks)**

ii) How the expenses would be applied in the model (e.g. as a % of premium or otherwise). **(2 marks)**

For both (i) and (ii), include an explanation for why you would take the approach you have outlined.

END OF QUESTION 3

END OF EXAMINATION

CJW AB