2019 PART III EXAMINATIONS

Subject Title: C2B Life Insurance

Date: Monday, 29 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	32
2	27
3	31
Total	90

Candidates are required to answer ALL questions.
This paper has **TEN** (10) pages (including this page).

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QUESTION 1 (32 Marks)

EZLIFE is an Australian life insurer whose only products are a stepped-premium retail lump sum risk portfolio (with Death and TPD covers). Its retail lump sum risk products are highly reinsured with large upfront reinsurance commissions that mostly offset the large upfront adviser commissions and initial expenses.

A new Chief Executive Officer (CEO) from one of Australia's largest life insurers has recently joined EZLIFE. The CEO's first initiative was an organizational review of EZLIFE's business strategy resulting in the following plans:

- recapture a large portion of its business;
- continue EZLIFE's rapid growth in the retail lump sum risk space; and
- consider opportunities to expand into selling other life insurance products (e.g. retail disability income products).

For the recapture, new reinsurance terms have been agreed where the changes are:

- 35% of the claims will be covered by reinsurance on a quota-share basis (reduced from current 90%);
- reinsurance premium rates will be 33% of the office premium rates (reduced from current 70%);
- upfront reinsurance commissions on new business will no longer be paid; and
- EZLIFE makes a one-off payment of $215m to the reinsurer, payable on 1 July 2019.

The new reinsurance terms will come into effect on 1 July 2019, and will apply to all existing in-force business and new business.

You are the Valuation Actuary reporting to the Appointed Actuary. Your role involves performing the monthly policy liability valuations and analysis of profit. EZLIFE has always adopted the accumulation basis for its policy liability valuation.

Note: The accompanying spreadsheet is titled "C2B_Sem 1_2019_Q1.xlsx".

a) Explain why the reinsurer would require the one-off payment from EZLIFE. **(2 marks)**

b) The Appointed Actuary has determined it is time to adopt a projection approach for determining the policy liabilities. He intends to recommend to management to adopt the projection approach from 1 July 2019 onwards.

Assist the Appointed Actuary in drafting a memo for this recommendation, addressed to the management team and to the Board of EZLIFE. The memo should cover the following items:

i. Justify why a projection basis would be more appropriate (than an accumulation basis) for the business from 1 July 2019 onwards. **(3 marks)**

ii. Explain potential implications of this shift in valuation methodology on the recognition pattern of expected future profits for the business. **(3 marks)**

iii. Outline the operational benefits that using a projection basis could bring to the business. **(3 marks)**

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c) The management team has accepted the Appointed Actuary's recommendation to adopt a projection approach for policy liability valuations. Referring to the accompanying spreadsheet, perform projections of the Policy Liability and its components on the projection basis:

i. Before allowance for the new reinsurance terms in sheet "Projection (Before Recapture)"; and **(8 marks)**

ii. After allowance for the new reinsurance terms in sheet "Projection (After Recapture)". **(2 marks)**

Note:

- For both sheets above, all cells in columns D to U which are highlighted in yellow must be completed.

  (Hint: Once you have completed the projection for sheet "Projection (Before Recapture)", you may copy across the formulae to sheet "Projection (After Recapture)" and change inputs/formulae as required.)

- In both sheets, you have been provided with the sum insured in-force ($55bn) and the premium amount received on 1 July 2019 ($200m), gross of reinsurance, in cells D11 and E11 respectively (i.e. cells highlighted in green).

- Sheet "Key Information" contains the valuation assumptions, profit carrier information, reinsurance ratio information, and the Policy Liability components (on accumulation basis) as at 1 July 2019.

- Ignore reserves for claims incurred prior to 1 July 2019 (i.e. IBNR and RBNA).

- Ignore tax.

d) The Appointed Actuary is preparing an update to the management team on the impact of the new reinsurance terms on the financials of the business.

i. Based on your projections in part c), determine the impacts of the new reinsurance terms on:

- Expected level of overall profitability of the business.
- Reduction in EZLIFE's profitability from a 10% increase in claims assumptions.
- Reduction in EZLIFE's profitability from a 10% increase in lapse assumptions.

Explain why each of these impacts are as you would expect. **(4 marks)**

ii. Explain how you would expect the Embedded Value of EZLIFE to be impacted from the new reinsurance terms. Also, considering these impacts from the shareholders' perspective, suggest arguments that the management team can put forward to shareholders for further capital injections to continue supporting EZLIFE's business strategy of continued rapid growth in the retail lump sum risk space and expansion into other life insurance products.

Note: No calculations are required for part d)ii. **(4 marks)**

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iii. Given the rapid growth of EZLIFE's business and lack of credible lapse experience, the lapse rate assumptions adopted in EZLIFE's monthly policy liability valuation are based on industry benchmarking results. The lapse rate assumptions are applied in an approximate manner, where:

- The average policy duration of the portfolio is calculated for the first projection year (x), and then assumed to increase by one year for each subsequent projection year (i.e. assumed policy duration in the next year would be x + 1).
- A single lapse rate is adopted across the portfolio for each projection year, based on the average policy duration of the portfolio for the projection year.

Explain the implications of this approach on the observed profit volatility of the business. **(3 marks)**

END OF QUESTION 1

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QUESTION 2 (27 Marks)

You are the valuation actuary in a large internationally owned life insurer, Australia Life Pty Ltd ("AusLife"), that writes the following business:

- Yearly Renewable Term ("YRT") lump sum business (death cover only) which is fully underwritten and sold through individual financial advisers. All of this business is classified as Ordinary business and is written into AusLife's Statutory Fund 1 ("SF1"). It is open to new business and considered as one Related Product Group ("RPG") for financial reporting purposes. The profit carrier for the RPG is premiums; and
- Investment-Linked superannuation business that is written into Statutory Fund 2 ("SF2"). This product is closed to new business.

Following a recent internal review of its business and declining sales of its YRT business, AusLife is planning to launch a new product, TermLife, as follows:

- TermLife will offer a death benefit and will be sold via independent financial advisers. The product is fully underwritten and offers no other benefits;
- TermLife will be available for a 15 year term with premiums payable for the first 10 years only;
- The premium rates for customers are guaranteed to not change and will also remain level for the premium paying term; and
- AusLife will reinsure TermLife with ABC Reinsurance Pty Ltd ("ABC Re") on a quota share basis with 30% of the risk being reinsured. The reinsurance premiums are on a risk premium basis (i.e. no commission and are age-based rates) and ABC Re can re-price the business under certain conditions.

The company is keen to launch the new product as quickly as possible. Sales of its existing YRT product will cease when the new product is launched.

Note: There is no accompanying spreadsheet for this question.

a) Given that TermLife is a new product with different features compared with its existing YRT product, the Chief Financial Officer ("CFO") is keen to understand how the policy liability and the capital requirements will be determined and how the approach may differ compared with their existing YRT business. The CFO has asked you to write a memo to her in which you address the following points:

- Explain whether the TermLife product can be included within the existing YRT RPG

  (3 marks)
- Explain the differences, if any, in determining the incurred claim reserves (i.e. Reported But Not Admitted ("RBNA") and Incurred But Not Reported ("IBNR")) between the TermLife product and the existing YRT business; and

  (1 mark)
- If we assume that TermLife is written in a separate Statutory Fund ("SF3"), explain the differences in the drivers of the Adjusted Policy Liability ("APL") and the Insurance Risk Charge ("IRC") between TermLife and the existing YRT business.

  (3 marks)

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b) The CFO has circulated your memo to the Executive Team. The Chief Risk Officer ("CRO"), has some additional questions and comments which he would like you to address. In particular:

i. Capital Management:

Assuming the TermLife Product and YRT products will be written in separate Statutory Funds, I am keen to understand how different investment strategies would impact components of the Prescribed Capital Amount and accounting profit. For example:

- If the assets backing the TermLife product are entirely in cash (at call), how would changes in interest rates impact the Asset Risk Charge ("ARC") over the life of the TermLife product? **(4 marks)**
- If instead of being 100% invested in cash at call, we invested in Commonwelath Government Bonds, such that we duration matched to the Adjusted Policy liability in order to minimise interest rate volatility. What implications would this matching have on the accounting profit and the capital position (or PCA) over the life of the TermLife product? **(3 marks)**

Outline the points you would make to the CRO which addresses his comments and questions above.

ii. Risk Management

- The mortality and lapse experience on the existing YRT business has been adverse in recent years, which has led to assumption strengthening that was absorbed by reductions in the profit margins. Are we not exposed to even greater risks with the new product, given the premium rates are guaranteed?

Explain what would happen if adverse experience (mortality and lapses) emerged on the TermLife product and recommend two actions management could take to mitigate against the risk of adverse experience. **(4 marks)**

c) AusLife launched the TermLife product 5 months before the end of the financial year within a newly created Statutory Fund, SF3. Sales volumes of TermLife in this time have been significantly higher than expected, with lapse rates being in line with expected. Due to competing priorities, the IT department and the modelling team within the actuarial department have not been able to incorporate the TermLife product into the actuarial valuation processes.

The Appointed Actuary has asked you to address the following questions in relation to how the TermLife product will be valued for the year-end valuation:

i. Outline how the policy liability and adjusted policy liability for the TermLife product will be determined in the absence of a valuation model. Your answer should also outline how you would test against any adequacy thresholds. **(4 marks)**

ii. Outline how the PCA for the TermLife product will be determined. You should only consider the IRC, ARC and Operational Risk Charge ("ORC") components.

(3 marks)

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iii. When the valuation model is ready to value the TermLife product, there will be a difference between what the valuation model has determined and the approach adopted. Outline how the difference should be incorporated into the profit reporting and potential considerations. **(2 marks)**

Where relevant, please include details of any approximations or assumptions made.

END OF QUESTION 2

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QUESTION 3 (31 Marks)

EVLIFE is an Australian life insurance subsidiary of an overseas bank EVBANK. EVLIFE's current market share is relatively small, and only sells Retail Yearly Renewable Term (YRT) products. Relevant facts of the YRT business are:

- The products provide disability income cover, have a stepped premium structure, are underwritten, and are sold with high upfront adviser commissions via a financial adviser subsidiary of EVBANK.
- EVLIFE's current business plan is to continue to rapidly grow the YRT business and increase market share.
- There have been consistent indications of deterioration in the lapse experience for the business in recent years. As such, the lapse assumptions have been strengthened during the financial year ending 31 December 2018.
- The Insurance Risk Charge is positive (greater than zero) as at 31 December 2018.

A new Chief Financial Officer (CFO) with no life insurance background has recently joined EVLIFE. You are the Valuation Actuary who reports to the CFO.

Note: There is no accompanying spreadsheet for this question.

a) The CFO is currently reviewing the results for the past financial year before they are released to the market. The results presented are based on the reported profit and Embedded Value measures. Extracts of these results are provided in **Table 1** and **Table 2** of the **Appendix A**. The CFO would like to better understand the different measures and has the following questions for you.

i. Why do we present both measures and who are they intended for? Briefly outline one advantage of using Embedded Value over reported profit for business planning purposes. **(3 marks)**

ii. The change in the Embedded Value in **Table 1** (i.e. -\$2m) is quite different from the total reported profit in **Table 2** (i.e. +\$38m). In particular:

- Why is the "Expected return" item under **Table 1** different to the "Planned profit margins (including expected investment return)" item in **Table 2**? **(2 marks)**
- Why is the "Assumption changes – Non-economic" item under **Table 1** missing from **Table 2**? **(2 marks)**

b) The CFO is aware that one component of the Embedded Value is the Value of In-force Business (VIF), and that the expected change in VIF over each year is driven by the "Expected return" and "Value of New Business written over the year" items per **Table 1.** The CFO would like to better understand how the VIF is likely to change over time.

Draft a response to the CFO. You should:

- List the two main components which comprise the VIF. **(1 mark)**
- Outline how these components are likely to change over time, including considering the case where the lapse experience continues to deteriorate. Explain your rationale taking into account the specifics of EVLIFE. **(6 marks)**

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c) The CFO would like to better understand how different circumstances of the business would change the Embedded Value of the business.

i. In determining the Embedded Value of the business, EVLIFE currently adopts a simplified methodology in projecting target surplus, that is:

- the target surplus as at 31 December 2018 is determined such that there is a 1-in-40 year likelihood of breaching the prudential capital requirement; and
- the target surplus is then assumed to run off in future periods in proportion to the annual sum insured in-force over the projection period.

Outline the likely impact on the level of Embedded Value as at 31 December 2018, if the methodology is revised so that the target surplus is assumed to be run-off in future periods in proportion to the projected Prudential Capital Requirement (PCR). **(3 marks)**

ii. For the following scenarios, outline the likely drivers impacting the level of Embedded Value for the business as a whole. For each driver, consider the immediate impacts on the Embedded Value.

- Scenario 1: Shifting the allocation of EVLIFE's investment assets backing the disabled lives reserves towards growth assets (e.g. equities). **(2 marks)**
- Scenario 2: Implementing re-pricing for the existing in-force business, resulting in a uniform percentage increase in premium rates across all existing policyholders. **(2 marks)**
- Scenario 3: Management decision to out-source the claims management function to an external third-party specialist provider. **(2 marks)**

d) The CFO has found the 31 December 2018 investor report for a large Australian life insurer ALIFE. The CFO is interested in comparing the Embedded Value of the YRT business of EVLIFE and of ALIFE.

Relevant facts for ALIFE are:

- ALIFE is owned 80% by an Australian bank ABANK, and 20% by external shareholders.
- ALIFE sells a wide range of life insurance products. ALIFE's YRT products are similar to EVLIFE's in that they provide disability income cover, have a stepped premium structure, are underwritten, and are sold with high upfront adviser commissions via a financial adviser subsidiary of ABANK.
- Following recent widespread media coverage of its claim management practices, ALIFE has experienced significant reputational issues.

i. From ALIFE's investor report, the CFO picks up the published Embedded Value figure for the YRT book. She asks you to outline and explain three key adjustments you would make to ALIFE's figure if "EVLIFE owned and managed ALIFE's YRT book (but not owned ALIFE itself)". Draft your response. **(6 marks)**

ii. From ALIFE's investor report, the CFO notes that for ALIFE's YRT business, the Value of New Business for One Year of Sales is negative, but the new business profit margins are positive. Explain how this could occur and what it means for ALIFE. **(2 marks)**

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APPENDIX A

Table 1: Extract from Annual Investor Report: Analysis of Change of Embedded Value over the Financial Year Ending 31 December 2018

	Total ($m)
Embedded Value as at 31 December 2017	**500**
Expected return	+70
Experience changes	
- Investment return	-10
- Others	-20
Assumption changes	
- Economic	+10
- Non-economic	-30
Value of New Business written over the year	+8
Distribution of shareholder dividends	-30
Embedded Value as at 31 December 2018	**498**

Table 2: Extract from Notes to Annual Financial Statements: Analysis of Reported Profit over the Financial Year Ending 31 December 2018

	Total ($m)
Total reported profit	**+38**
Planned profit margins (including expected investment return)	+50
Experience changes	
- Investment return	-9
- Others	-10
Assumption changes	
- Economic	+5
Capitalised losses or reversals	0
New business profit margins	+2

END OF QUESTION 3

END OF EXAMINATION

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