2016 PART III EXAMINATIONS

Subject Title:	**C2B Life Insurance** (long answer component)
Date:	**Friday, 29 April 2016**
Time:	**10:00 am – 10:15 am** (Reading Time) **10:15 am- 1:15 pm** (Examination)
Time allowed:	Three (3) hours and fifteen (15) minutes including reading time.
Instructions:	Type your answers to the questions using Microsoft Word and ensure that there is no data linked to spreadsheets. You must submit your Excel answer file(s).
Number of Questions:	**Three** (3)

Question	Marks
1	23
2	19
3	18
Total	60

Candidates are required to answer ALL questions. This paper has seven (7) pages (including this page).

QUESTION 1 **(23 Marks)**

You have recently been appointed as the Capital Actuary for Blue Ocean Insurance (BOI), a life insurer operating in Retailia (a small, fictional country).

Life insurance in Retailia is predominantly Yearly Renewable Term business including Total & Permanent Disability, Trauma and Disability Income business, sold through financial advisors with high upfront commissions. BOI is a relatively new company within the market, and has differentiated itself from its competitors by introducing a simple, direct-sold insurance product through an arrangement with a national supermarket chain. Thanks to lower commissions, a simpler sales process, and by being the only direct-sold insurer in the market, BOI has established a profitable, fast-growing portfolio.

Retailia's prudential regulator has recently become concerned about the quality of stress testing performed by insurers. It believes that insurers are not sufficiently considering the various risks posed to their portfolios when assessing their capital strength and determining Target Surplus. It raised this concern in a letter to all insurers, in which it also asked them to conduct a stress on their capital position based on a prescribed scenario.

The regulator's prescribed scenario is to assume that there is a pandemic that results in not only an increase in mortality and morbidity rates, but also leads to a market downturn resulting in widespread unemployment and unfavourable market conditions. This leads to the following impacts:

- Shock lapses;
- An increase in claims;
- Lower sales; and
- Lower investment returns.

In this scenario, it is assumed that these conditions are prolonged.

It specified the following assumptions to be used for the scenario:

	Sales	**Lapses**	**Claims**	**Investments**
Immediate Impact	n/a	20% shock lapse of inforce portfolio	n/a	20% fall in non-cash assets
Change to Future Experience	50% drop in projected sales	25% increase in lapses excluding lapses for first renewal of policy (e.g. a lapse rate of 12% increases to 15%)	20% overall increase in claims cost (for all products)	50% reduction in investment return (you may assume that the risk-free discount rates do not change)

After reading the regulator's letter, the CFO of BOI, who is an actuary and very familiar with the Capital standards, has asked for your view on BOI's capital position. Specifically, they want to know:

- The results of the stress test scenario prescribed by the regulator; and
- Whether BOI's current Target Surplus is appropriate.

To aid in your response, you have been provided with a spreadsheet summarising various aspects of BOI's financials, but with some items left blank for you to complete.

Along with the assumptions and information provided in the spreadsheet, you should also note and/or assume the following:

- Unless otherwise stated, all Australian accounting and Life Prudential Standards are applicable in Retailia.
- BOI uses claims as its profit carrier.
- BOI's Target Capital is set as being 20% higher than the prescribed capital amount (PCA), with the capital position reviewed quarterly to ensure that this is met.
- Due to the infancy of BOI and direct-sold business in Retailia, the regulator has stipulated that BOI calculates its PCA using the following calculation:

  PCA = Stressed Net RFBEL, subject to a minimum of $10m

  where *Stressed Net RFBEL* is calculated the same way as the net of reinsurance RFBEL, but assuming claims and renewal expenses (excluding commissions) are 95% higher than best estimate.

  Aside from this, the regulator has not specified other special adjustments to capital.
- BOI is owned by a small group of private investors. They injected capital to start the company and are prepared to accept volatile dividends to ensure its growth. However, they are not in a position to inject more capital into the business in the near future.
- BOI's reinsurer is a large global reinsurer with a local life insurance license that is of high credit rating. All reinsurance contracts are legal, binding, and apply to all business sold by BOI.
- The Appointed Actuary and the management of BOI would need at least two years of consistently adverse experience following an event before they would change their view of future experience.
- For simplicity, you may assume:
  - When calculating the capital base for BOI, RFBEL = BEL;
  - Best Estimate and stressed Unearned Premium Reserves, Incurred But Not Reported and Reported But Not Admitted reserves are zero; and
  - Premiums, commissions and sales are made/received at the beginning of BOI's financial year. Expenses, claims and lapses are paid/occur at the end of BOI's financial year.

a) Complete the projection of BOI's base 3-year business Plan by filling in the missing values in the provided spreadsheet. *Further guidance on the use of the spreadsheet is provided at the end of the question.*

(6 marks)

b)

i) Perform the regulator's prescribed stress test using the spreadsheet.

(3 Marks)

ii) Estimate the impact of and comment on changes to the BEL that could reasonably be made by the Appointed Actuary in response to the scenario.

(4 Marks)

iii) Estimate the impact of and comment on appropriate actions by management to mitigate the scenario.

(2 Marks)

c) Using the results from (b) or otherwise, suggest a plausible scenario that would lead to BOI breaching the PCA within the next three years. Specify the amount of each stress in the scenario and state why management actions would be unable to avoid breaching the PCA.

(3 Marks)

d) Draft a note to the CFO addressing their questions, including a discussion of BOI's performance in the regulator's prescribed scenario and your view on BOI's current Target Surplus policy.

(5 Marks)

Spreadsheet Guidelines

Complete part (a) in the worksheet [(a)].

For (b)(i): Copy your completed worksheet from (a), name this "(b)(i)", and apply the stresses here.

- For (b)(ii): Copy your completed worksheet from (b)(i), name this "(b)(ii)", and apply your changes to BEL here.

- For (b)(iii): Copy your completed worksheet from (b)(ii), name this "(b)(iii)", and apply your management actions here.

You should submit a completed version of the Excel template in your response, and note clearly all working and assumptions you've made in the spreadsheet or in the accompanying Word document.

END OF QUESTION 1

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QUESTION 2 **(19 Marks)**

You are the Appointed Actuary for a large, well established, Australian Life Insurer, Trigger Life Ltd. Trigger Life sells a range of life insurance products, including Yearly Renewable Term, Level Term, Disability Income, Total & Permanent Disability and Trauma business. They also have a legacy portfolio of products which are now closed to new business, including participating, non-participating and annuity products.

The participating portfolio is completely made up of Whole of Life policies and profits are distributed to policy owners via reversionary bonuses only. The portfolio has performed well over the years and there are now substantial levels of policy owner and shareholder retained earnings. The participating business is kept in its own statutory fund (Statutory Fund No. 2) separate from the rest of Trigger Life's business.

The CFO at Trigger Life is relatively new, and this is the first year-end cycle he has been involved with. He has a background in life insurance so is familiar with the concepts of MoS, but has never worked anywhere that has participating business before.

a) Explain to the CFO how the MoS methodology works for calculating the policy liability for participating business, and how it differs from non-participating business. **(4 marks)**

Your analyst has prepared the following figures for the 31 December 2015 year-end.

- Policy owners' retained earnings at the beginning of 2015	\$50,250,000
- Interest earned on policy owners' retained earnings in 2015	\$2,010,000
- Total profits for the participating portfolio (after tax) in 2015	\$4,800,000
- Cost of declared bonuses for 2015	\$ 3,300,000

The policy owners receive 80% of profits, and the shareholders 20%.

b) What is the shareholder profit and the shareholder retained earnings of the participating statutory fund, Statutory Fund No. 2, at the end of the year after the bonuses have been declared? **(3 marks)**

The CFO has heard someone mention the risk of a tontine occurring for participating business, where the policy owners' retained earnings remain on the balance sheet forever if they have not been distributed to policy owners before the last participating policy expires.

The CFO has come up with the following ideas in order to reduce the risk of a tontine occurring:

- Distributing any excess policy owners' retained earnings to the shareholders;

- Making a one-off bonus declaration now, and increasing future bonus declarations;

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- Purchasing a participating book of business from another life insurer, which does not have such a large build-up of policy owners' retained earnings, merging this with the existing book and having one bonus series for the combined book; and

- Using the sizeable policy owners' retained earnings to fund the growth of the open life insurance business.

c) Draft a memo to the CFO responding to each of their ideas (considering each idea independently of the others), including covering each of the following points:

  - Whether it is possible to distribute excess policy owners' retained earnings to the shareholders;

  - What happens to each of the policy owners' retained earnings, policy liability and MoS profit if an additional bonus declaration were to be made;

  - What the key considerations and implications are of purchasing a participating book of business from another life insurer, which does not have such a large build-up of policy owners' retained earnings, merging this with the existing book and having one bonus series for the combined book;

  - Whether it is possible to fund the growth in the open life insurance business using the policy owners' retained earnings, explaining why this is the case; and

  - Any other issues you have identified with each of the CFO's suggestions.

(12 marks)

END OF QUESTION 2

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QUESTION 3 **(18 Marks)**

You have recently taken on the role of Appointed Actuary of Bambury Life, a well-established, medium sized Australian life office. Bambury Life has an established book of Yearly Renewable Term, Total & Permanent Disability and Trauma products. A few years ago it launched a Disability Income product which has grown rapidly, recently overtaking Term as the product generating the most sales, and now makes up 30% of the total inforce premiums. All of their business is stepped premium. Bambury Life does not use any reinsurance.

The Disabled Lives Reserve is included with the Active Lives Reserves in the Related Product Group (RPG) for the purposes of setting profit margins. Expense assumptions are applied to the number of policies inforce as well the number of claims in the course of payment. Bambury Life uses premium as the profit carrier.

As part the of experience analysis work performed in 2015, the morbidity assumptions for Disability Income have been based on the recently released FSC-KPMG ADI 2007-2011 standard table. A feature of this table is the noticeable increase in incidence rates by policy duration, a factor that had not previously been allowed for in Bambury's valuation assumptions. In addition, the shape of termination rates differs significantly from Bambury's current basis – with much lower termination rates in the standard table for claims beyond a five year duration.

As a result of implementing the new morbidity assumptions, the revised Present Value of Profit Margins (PVPM) has become negative. You are about to undertake the 31 December 2015 year-end Valuation (the company's financial year is the calendar year).

In order to prevent the Disability Income RPG from entering loss recognition, the CEO has proposed that Bambury immediately approve an increase in premium rates on inforce and new business of 20% to be effective from 1 July 2016. He has suggested that this will restore the profitability of the RPG in 2015 (i.e. allow the future premium increase to be included in the BEL calculation at 31 December 2015).

a) What issues need to be considered and what sign-offs would you require to support the CEO's recommendation?

(8 marks)

b) Going forward, the new morbidity assumptions will have an impact on the Analysis of Profit (AOP) for the Disability Income business. Describe the various components that make up the Disability Income claims experience item in the AOP and explain the likely impact on each of these components going forward as a result of the adoption of the new morbidity assumptions.

(6 marks)

c) Bambury Life has now approved the rate increase, and has been allowed to factor this into the 31 December 2015 valuation. This has resulted in a net profit margin reduction, after also taking into the account the morbidity assumption strengthening, from 10% to 5%.

Explain the impact this is likely to have on the expected profit in 2016.

(4 marks)

END OF QUESTION 3

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