COURSE 2B LIFE INSURANCE **SEMESTER 2 2014 EXAMINATIONS**

QUESTION 1 **(34 Marks)**

Cobra Life is an Australian based Life Insurance Company with all business written in a single statutory fund. Cobra Life has been in business in the Australian market since 2008 and has written individual lump sum (Death and TPD) and Disability Income business through the independent financial advisor channel in that time. All of the business is monthly premiums. In addition, Cobra Life took a book of disability income claims in payment from another company (ASP Life) at the start of 2012. All of the claims in payment from this transaction relate to claims that were incurred prior to 2000. Cobra Life has a treaty with a reinsurer that provides reinsurance on a per life basis for cover above stated maximum retentions.

You are the Appointed Actuary at Cobra Life. As the Appointed Actuary, you are responsible for providing advice to the Board of Cobra Life on the selection of the stress margins used to determine the Insurance Risk Charge consistent with the requirements of Prudential Standard LPS 115.

For the purposes of determining appropriate stress margins, you have been able to source the following information (all figures and analysis are net of reinsurance):

	DEATH & TPD INCIDENCE					
	Cobra Life Experience			Industry Experience[1]		
	Exposure Years	By Amount		Exposure Years	By Amount	
		A / E	99.5th Percentile		A / E	99.5th Percentile
2008	10,000	91%	75% - 107%	1,200,000	99%	92% - 98%
2009	23,000	91%	78% - 104%	1,250,000	102%	90% - 96%
2010	60,000	94%	83% - 105%	1,300,000	101%	92% - 98%
2011	120,000	98%	90% - 108%	1,300,000	98%	95% - 101%
2012	180,000	100%	93% - 107%	1,350,000	102%	94% - 98%
2013	150,000	103%	97% - 109%	1,350,000	98%	97% - 101%
2014	350,000	106%	101% - 111%	1,450,000	101%	96% - 100%
2008 - 2014	**893,000**	**102%**		**9,200,000**	**100%**	

1) Expressed as a percentage of Cobra Life's current expected basis

	DISABILITY INCOME CLAIMS COST[2]					
	Cobra Life Experience			Industry Experience[1]		
	Exposure Years	By Amount		Exposure Years	By Amount	
		A / E	99.5th Percentile		A / E	99.5th Percentile
2008	1,500	86%	46% - 126%	600,000	99%	94% - 104%
2009	3,250	92%	59% - 125%	625,000	98%	93% - 103%
2010	6,000	98%	75% - 121%	650,000	102%	97.5% - 106.5%
2011	13,000	105%	88% - 122%	650,000	108%	103.5% - 112.5%
2012	80,000	94%	86% - 102%	675,000	110%	106% - 114%
2013	92,000	94%	87% - 101%	675,000	110%	106% - 114%
2014	102,000	94%	88% - 100%	725,000	115%	112% - 118%
2008 - 2014	**297,750**	**94%**		**4,600,000**	**106%**	

1) Expressed as a percentage of Cobra Life's current expected basis

2) Disability Income Claims cost includes claims incidence and termination experience

a) Assuming no additional information is available, draft an internal memo to the board recommending appropriate random and future stress margins to be used for the calculation of the insurance risk charge for lump sum and disability income business. Include commentary justifying your position. Note that a spreadsheet containing the above information has been provided.

(12 marks)

b) The information below has been provided regarding the financial position of Cobra Life's statutory fund for the year ending 31 December 2014.

COBRA LIFE BALANCE SHEET - STATUTORY FUND			
Assets	**$m**	**Liabilities**	**$m**
Outstanding Premiums	35	Outstanding Claims	30
Cash	30		
Fixed Interest	150		
Active Life Reins Policy Liabilities	(30)	Active Life Policy Liabilities	(150)
Reinsured IBNR	6	IBNR	30
Reinsured Disabled Lives Reserve	20	Disabled Lives Reserve (DLR)	100
Deferred Tax Assets	10		
Total Assets	**221**	**Total Liabilities**	**10**
		Net Assets	**211**

ADDITIONAL INFORMATION	
Item	**$m**
Premium Revenue 2013	150
Premium Revenue 2014	170
Active Lives RFBEL[1]	(170)
Stressed Active Lives Policy Liabilities[1]	(46)
Stressed IBNR[1]	34
Stressed DLR[1]	120

1) Net of reinsurance

You are calculating the capital in excess of the Prescribed Capital Amount at 31 December 2014.

Using the information above, complete the figures in the table below. Clearly document your calculation steps and any assumptions you make (in the Word document or the accompanying spreadsheet).

You may assume:

- a tax rate of 30%;
- that the impact of 12 month stressed cash flows is immaterial;
- for the combined stress scenario that only tax recoverability need be considered; and
- the stressed policy liabilities are
    - shown net of all stresses,
    - calculated post diversification,
    - net of reinsurance; and
    - include the effect of any assumed management actions.

Summary of Prescribed Capital Amount	$m
Asset Risk Charge	13.0
Insurance Risk Charge	
Less: Aggregration Benefit	
Asset Concentration Risk Charge	0.0
Operational Risk Charge	
Combined Scenario Adjustment	
Prescribed Capital Amount	

Summary of Capital Base	$m
Net Assets	
Less: Regulatory Adjustments to Net Assets	
Capital Base	

Capital Adequacy Assessment	$m
Capital in Excess of Prescribed Capital Amount	

(10 marks)

c) Your analyst does not understand a number of the parts of the capital calculation for Cobra Life's statutory fund or the General Fund. The analyst has set up a meeting with you with the following questions as part of the agenda:

i. The only capital Cobra Life holds is in ordinary shares. Then what are the "regulatory adjustments to net assets" used in the calculation of the capital base for the statutory fund and the general fund of Cobra Life?

ii. A friend of mine at Viper Life said that their Insurance Risk Charge is zero. Is this possible, and if so, in what circumstances would you expect this to occur?

iii. I hear people talk about a Prudential Capital Requirement (rather than Prescribed Capital Amount). Are these the same thing? Why don't we just use "Prudential Capital Requirement" in our accounts?

Outline the responses you would have ready for each of these questions.

(7 marks)

d) Cobra Life is considering moving into the individual life insurance market of Taipan, a country with the same regulatory regime as Australia. The business would be written in a separate statutory fund and would only involve new individual risk business written through independent financial advisors. As part of the preparations, the Board has asked if you will be recommending the same insurance risk margins as those assumed for the Australian Statutory Fund. Note that they have asked about all the insurance risk margins, not just those included in your response to part (a).

You have asked your analyst to put together some supporting information on the

Taipanese life insurance market. Your analyst has provided you with the following points:

Some features of this Taipan market compared to the Australian market include:

- The same types of business are written;
- Advisors are generally paid higher up-front commissions;
- Volumes of business are far smaller given the size of population; and
- Taipan is more prone to natural disasters.

Set out the points you would make in your response to whether you would recommend the same insurance risk margins. **(5 marks)**

SOLUTIONS QUESTION 1

a)

TO: Cobra Life – Board of Directors

FROM: Appointed Actuary

RE: Recommendation for Future Risk Margins – Random and Future Risk

The purpose of this note is to provide recommendations for future and random risk margins for Cobra Life's Statutory Fund that contains individual lump sum and disability income business. Under LPS115, both of these margins need to cover scenarios at a 99.5% level (i.e. a 1 in 200 year scenario).

Random Risk Margins

Random risk margins are determined at the 99.5th percentile level. Based on 2014 exposure, the Cobra Life 99.5th percentile for lump sum business is 5% above the experience for that year and 6% for disability income. Whilst these numbers appear low, the variability of Cobra Life's experience may be reduced somewhat by the surplus reinsurance cover that the company has in place.

Hence, a 5% margin is recommended for individual lump sum business and 6% for individual disability income business.

Future Risk Margins

Individual Lump Sum

Individual lump sum experience for the market as a whole has been generally flat in the 2008 – 2014 period and as such there is no obvious sign of a trend in experience over that period. Over that same period since 2008, Cobra Life has grown at a significant rate (far higher than the market growth). This growth coupled with the actual to expected experience on Cobra Life's portfolio leads me to believe there is a heightened level of risk on Cobra Life's portfolio than may exist in the industry statistics. This may be due to Cobra Life looking to increase market share at the expense of underwriting rigor.

The table below shows the average actual to expected experience for the periods 2009 – 2011 and 2012 – 2014.

	Cobra Life	Industry
2009 - 2011	96%	100%
2012 - 2014	104%	100%
% Change	**8%**	**0%**

Based on this data, there appears to be a trend in the Cobra Life experience (which is not clearly evident in the industry experience).

Other considerations for the future risk charge include trends in mortality experience (e.g. obesity), TPD experience (e.g. due to economic factors) and TPD (e.g. changes in definitions or increased involvement of lawyers). It is difficult to fully justify a 99.5th percentile estimate for these changes, and hence a high degree of judgement needs to be

incorporated to overlay the impact of these elements of the future trends.

Given the 8% deterioration in experience in recent years for Cobra Life, for a 1 in 200 year scenario, a margin above 8% would be appropriate. Given this, and considering the other trend considerations listed above, a future margin in the range of 20% - 40% would be appropriate. I recommend a margin of 30%.

Individual Disability Income

Cobra Life's current systems cannot easily determine the experience between the book of disabled lives that were purchased in 2012 and those that have been written since 2008. The table below shows the Cobra Life experience and industry experience (note that the Cobra Life experience uses years up to 2011 to exclude the experience of the purchased disability claims portfolio).

Cobra Life		Industry	
2008 - 2009	90%	2009 - 2011	103%
2010 - 2011	103%	2012 - 2014	112%
% Change	**14%**	**% Change**	**9%**
2012 - 2014	**94%**		

As for the lump sum experience, there seems to be a greater trend in the experience of the Cobra Life book than that in the industry experience. Cobra Life's exposure to individual disability income also increased significantly over the period to 2011. Given the high levels of new business, this may imply that the business being written is showing more trend than that being seen in the industry as a whole. However, it is worth noting that the amount of business on which this assessment is based is much less than for individual lump sum so the data may not be credible.

The majority of the Cobra Life's exposure on the disability income business since 2012 comes from the book of claims that was purchased in 2012. For the 3 years since 2012, the actual to expected experience of the entire disability income portfolio has been 94%. This would tend to suggest that the trend risk of the purchased portfolio of claims is less than that of the remainder of the disability income business.

As for lump sum business, there are additional factors that can lead to future trends in the data. This can include economic factors, changes in the prevalence of mental illness etc. It is worth noting that the purchased book of claims only has termination risk as compared to the remainder of the business that has incidence risk also. It is also worth noting that the volume of the data for this business is far less than individual lump sum (and hence, there is greater uncertainty relating to the underlying best estimate assumptions for this business compared to individual lump sum).

Given, this I recommend that a future risk margin in the range of 25% - 50% for the individual disability income business sold by Cobra would be appropriate. I recommend 40%. For the book that was purchased from ASP Life, a range of 15% - 35% would be appropriate. I recommend 20%.

Marking Guide

- Maximum of 2 marks for including the following:

  - 1 mark for format and reasonable introduction of the topic to be covered in the memo
  - 1 mark for noting that there is a significant degree of estimation error around selecting a 1 in 200 year risk margin.

- Maximum of 2 marks for random risk charge noting

  - The 99.5th percentile from the analysis can be used (the 2014 result can be used or the student may want to consider the 99.5th percentile over time). [1 mark]
  - Recommending a random risk margin between 5% and 10% [1/2 mark each for LS and DI]
  - Comment on reinsurance being a reason for the low levels of random risk charge. [1 mark]

- Maximum of 4 marks for a reasonable synopsis of the future risk for individual lump sum business that incorporated the following points:

  - Noting Cobra Life experience poorer than industry experience [1 mark]
  - Noting the high levels of growth of Cobra Life versus the market [1 mark]
  - Noting that Cobra Life may have targeted growth at the expense of underwriting [1 mark]
  - Noting the other considerations in determining the future risk margin (i.e. those other items that may impact on the future trend risk) [1/2 mark each to max 1]
  - Concluding with a future risk margin that is in excess of the trend risk margin seen in the Cobra Life data.

    - 15% - 40% [1 mark]
    - 10-15% or 40% to 50% [1/2 mark]

- Maximum of 6 marks for a reasonable synopsis of the future risk for individual disability income business that incorporated the following points:

  - Noting Cobra Life experience poorer than industry experience [1 mark]
  - Noting the difference in experience since 2012 and noting that this is likely due to the purchased book of claims [1 mark]
  - Making some allowance in the analysis for the pre 2012 period vs. the 2012 onward period [1 mark]
  - Noting the other considerations in determining the future risk margin (i.e. those other items that may impact on the future trend risk) [1/2 mark each to max 1]
  - Commenting on the amount of data available to make determination for DI is less than lump sum (and the impact on selecting future margins) [1 mark]
  - Suggesting that separate risk margins could be applied to the ASP book and Cobra's own book [1 mark]

  - Recommending two future risk margins:

- Cobra Life 25%-60% [1 mark]
- ASP 15%-35% [1 mark]

- Recommending one future risk margin:

  - 25%-60% [1 mark]
  - 15%-25% or 60% to 70% [1/2 mark]

To a maximum of 12 marks

b) Prescribed Capital Amount Calculations:

1) Insurance Risk Charge

Insurance Risk Charge (pre-tax) = Stressed Policy Liabilities – Adjusted Policy Liabilities

Total Stressed Policy Liabilities = Stressed Active Lives Policy Liability

+ Stressed IBNR

+ Stressed DLR

Total Stressed Policy Liabilities = ($46m) + $34m + $120m = $108m

Adjusted Policy Liabilities = max (RFBEL for all policies, minimum termination value)

= max (Active Lives RFBEL + IBNR + DLR, IBNR + DLR)

= max (($170m) +$30m - $6m + $100m - $20m, $30m – $6m + $100m – $20m)

= max (($66m), $104m)

= $104m

Insurance Risk Charge (pre-tax) = $108m - $104m = $4m

Insurance Risk Charge (post-tax) = $4m x (1 – 30%)
= **$2.8m**

Note that the full tax effect is included in the insurance risk charge – the recoverability of this is tested in the calculation of the combined scenario adjustment.

2) Aggregation Benefit

Paragraph 37 of LPS110 defines the aggregation benefit as:

$$\text{Aggregation benefit} = (A + I) - \sqrt{A^2 + I^2 + 2 \times \text{correlation} \times A \times I}$$

where:

(a) 'A' is the Asset Risk Charge;

(b) 'I' is the Insurance Risk Charge; and

(c) 'correlation' is 20 per cent.

Hence:

Aggregation Benefit = - [(13.0m + 2.8m) – sqrt{$(13.0m)^2$ +$(2.8m)^2$ + 2 x 20% x 13.0m x 2.8m)}]
= **($2.0m)**

3) Operational Risk Charge

The operational risk charge is defined in LPS 118 as the following

ORCR = A × {maximum (GP1, NL1) + maximum (0, | GP1 – GP0 | – 0.2 x GP0)}

where:

(a) A is 2 per cent for a statutory fund that is a specialist reinsurer and 3 per cent for other funds;
(b) GP1 is premium income (gross of reinsurance) for the 12 months ending on the reporting date;
(c) NL1 is the adjusted policy liabilities (net of reinsurance) at the reporting date;
(d) GP0 is premium income (gross of reinsurance) for the 12 months ending on the date 12 months prior to the reporting date; and
(e) | GP1 – GP0 | is the absolute value of the difference between GP1 and GP0.

In this case:

- A is 3% since Cobra Life is not a specialist reinsurer; and
- NL1 = $104m (per the calculation of the insurance risk charge above).
- | GP1 – GP0 | = $170m - $150m = $20m.
- Since 20% of GP0 is $30m (i.e., less than | GP1 – GP0 |) and GP1 > NL1, the operational risk charge is simply 3% of GP1 i.e. 3% x 170m = **$5.1m**

4) Combined Scenario Adjustment

The main impact of the combined scenario adjustment is to test the recoverability of any tax effects that have come from the calculation of the insurance risk charge and asset risk charge.

Here an assumption needs to be stated that an approximate approach to the calculation of the combined scenario adjustment is being used such that the only effect is to assume that it reverses the tax effect in the asset risk and insurance risk charge. This is reasonable since Cobra Life already has a deferred tax asset (and hence, additional losses under a capital scenario are unlikely to realise the tax credits as tax credits already exist).

Combined Scenario Adjustment = Asset Risk Charge Tax Effect
+ Insurance Risk Charge Tax Effect

Combined Scenario Adjustment
= ($13m / 0.7) x 0.3 (i.e. gross up of after tax asset risk charge x tax rate)
+ $4.0m x 30% (per insurance risk charge calculation above)
= $5.1m + $1.2m

= **$6.3m**

Calculation of Prescribed Capital Amount

Summary of Prescribed Capital Amount	$m
Asset Risk Charge	13.00
Insurance Risk Charge	2.8
Less: Aggregation Benefit	-2.0
Asset Concentration Risk Charge	0.0
Operational Risk Charge	5.1
Combined Scenario Adjustment	6.3
Prescribed Capital Amount	25.2

Capital Base

Capital Base = Net Assets

- Regulatory Adjustments to Capital Base

Regulatory Adjustments to Capital Base = Adjusted Policy Liabilities – Policy Liabilities (both values net of reinsurance) + Deferred Tax Assets

Adjusted Policy Liabilities = $104m (see calculation for insurance risk charge)
Regulatory Adjustments to capital base = $104m –
($150m) – ($30m) +$30m - $6m + $100m - $20m)
+ $10m
= $104m + $16m + $10m = $130m

Capital Base = $211m - $130m
= $81m

Summary of Capital Base	$m
Net Assets	211
Less: Regulatory Adjustments to Net Assets	(130)
Capital Base	**81**

Capital in Excess of PCA = Capital Base - PCA
= 81 – 25.2
= 55.9

Capital Adequacy Assessment	$m
Capital in Excess of Prescribed Capital Amount	56

Marking Guide

1) Insurance Risk Charge (2 marks)

- 1 mark for correct pre-tax calculation of difference between stressed and adjusted policy liabilities
- 1 mark for including tax in the calculation.

2) Aggregation Benefit (½ mark)

- ½ mark for correct calculation

3) Operational Risk Charge (1 mark)

- 1 mark for correct calculation

4) Combined Scenario Adjustment (3 marks)

- 1 mark for assuming that the combined scenario adjustment to include the tax effect on the asset risk and insurance risk charges
- 1 mark for noting that a deferred tax asset exists (so it is a reasonable assumption that any tax effects will not be recoverable under the combined scenario adjustment)
- 1 mark for calculation

5) Capital Base (2 marks)

- 1 mark for calculation of regulatory adjustments
- 1 mark for including deferred tax asset

6) Overall Capital Assessment (½ mark)

- ½ mark for assessing the capital base against the Prescribed Capital Amount

7) Documentation (1 mark)

- 1 mark for explicitly documenting the calculations conducted

c)

i) Regulatory Adjustment to Net Assets

- For the statutory fund
  - This generally refers to the adjusted policy liabilities in excess of the reported policy liabilities. The adjustment acts to reverse out any of the negative policy liabilities in the company's balance sheet – i.e. the capital calculation does not take into account future profits (or DAC)
  - It also relates to intangibles including goodwill or deferred tax assets.
- For the general fund, the capital base should only include those capital instruments whose value will be available to the company at the point on "non-viability" (i.e. if the insurer is in trouble the capital from the instrument is available to the company at the company's discretion).

- Some preference shares and subordinated debt meet this definition if they meet the conditions described in LPS112.

For Cobra Life, if the only capital is ordinary shares then there will be no regulatory adjustments within the general fund, only the statutory fund.

ii) Insurance Risk Charge of Zero

- An insurance risk charge of zero can occur where the stressed policy liabilities (including stressed IBNR and stressed DLR) are less than zero.
- This would typically occur where there are large margins in the premiums charged by the insurer. This would typically be the case where
  - large up-front costs are incurred by the insurer and hence significant margins are built into the premium to recoup this cost; or
  - the insurer may be able to charge higher than normal premiums for their business (e.g. due to distribution methods).

iii) Prudential Capital Requirement vs Prescribed Capital Amount

- The Prudential Capital Requirement includes a regulatory adjustment which can be imposed by APRA on top of a company's Prescribed Capital Amount
- The Regulatory Adjustment and hence the Prescribed Capital Requirement is not allowed to be disclosed. Therefore only the Prescribed Capital Amount appears in a company's published accounts.
- If the PCR was published, the market or public may interpret it incorrectly and this could cause a loss of confidence in the insurer (e.g. resulting in higher lapses) and possibly for the industry as a whole if several insurers had regulatory adjustments imposed.

Marking Guide:

i)

For statutory fund adjustments:

- ½ a mark for difference in adjusted policy liabilities and policy liabilities
- ½ mark for other intangibles

For general fund adjustment

- 1 mark for describing why some capital instruments are not included in the capital base

Other

- 1 mark for relating the answer to Cobra Life's capital only consisting of ordinary shares.

ii)

- 1 mark for describing the situation where the insurance risk charge is zero

- 1 mark for giving an example of a situation where this would occur

iii)

- ½ mark for describing the regulatory adjustment
- ½ mark for noting that the Prudential Capital Requirement is not allowed to be published
- 1 mark for providing a reasonable rationale as to why the PCR is not allowed to be published.

d)

Random Risk

- Likely lower volumes of business will result in greater levels of random risk as there will be less policies in the insurance pool (i.e. individual policy fluctuations may have a greater impact on the insurance result)

Future Risk

- May consider a higher future risk given less data is available to price and value data than in Australia
- In terms of other trends, not much information to suggest any other material deviations in the future risk margin

Event Risk

- Event risk is likely to be higher than Australia given the prevalence of natural disasters
- However, a decision would need to be made as to whether this increased level of event risk is greater than the specified LPS115 minimums.

Lapse Risk

- Given higher up-front advisor commissions there may be a greater level of lapse risk due to churning and an argument exists for a higher lapse margin than in Australia
- If the higher up-front commission rates come with longer responsibility periods (e.g. longer commission clawback periods) then lapse risk may be similar to Australia

Expense Risk

- Expense risk is fixed at 10% and so would be the same for Australia and Taipan

Longevity Risk

- Not applicable as no annuity business

Marking Guide

- 1 mark for reasonable position on each of random, future, event and lapse
- ½ mark each for expense and longevity

To maximum of 5 marks

QUESTION 2 **(26 Marks)**

Tau is a reasonably sized (fictional) country in the South Pacific. Life Insurers in the market must be locally incorporated and meet local accounting rules. However, reinsurers may be incorporated in foreign countries and hence do not have to report under local accounting rules.

The current accounting regime in Tau is consistent with the Australian IFRS basis. Tau has a capital regime in line with the Australian LAGIC requirements.

You are the valuation actuary for Pi Life, a life company that has operated in the Tau market for the last 15 years. Pi Life writes life insurance business covering Death and Total and Permanent Disability business. The policies issued by Pi Life are sold with mortgages and have the following characteristics:

- All policies are guaranteed renewable with premium rates that can be changed annually;
- The term of the policies is consistent with the term of the mortgage. Based on latest information, the average term for a new mortgage is 15 years;
- Up front commission of 130% of first year premium is paid to the mortgage broker. For each year the policy renews a commission of 25% of premium is paid to the broker; and
- The cost for Pi Life of issuing the policy is 70% of the first year's premium.

A simplified balance sheet for Pi Life at 31 December 2013 is shown below:

Assets	**$m**		**Liabilities**	**$m**
Cash	30		Payables	25
Investments	270		Gross Policy Liability	(80)
Receivables	15			
Reinsured Policy Liability	(20)			
			Total Liabilities	(15)
			Equity	
			Issued Capital	50
			Retained Profits	260
TOTAL	**295**		**TOTAL**	**295**

a) You have been provided with the following additional information:

- The present value of expected future profits using a discount rate based on the current risk free rate (3.5%) plus 8% pa is $50m. This discount rate is consistent with the discount rate required to be used in the determination of the Embedded Value for Pi Life;

- The DAC balance at 31 December 2013 was $200m of which $50m was reinsured; and

- The Prescribed Capital Amount at 31 December 2013 is $120m. Target capital is calculated as 20% of the Prescribed Capital Amount. For the inforce business, the Prescribed Capital Amount is expected to run off over a straight-line basis over the next 20 years.

Based on this information, determine the Embedded Value for Pi Life at 31 December 2013. State any assumptions you make. Ignore tax in your calculation.

(4 marks)

b) In Tau, there is discussion of a change in the accounting regime. In particular, the term over which any acquisition costs can be amortised will be equal to the period over which the premium rates are guaranteed by the insurer.

The Board of Pi Life is concerned that this change would have an impact on the publically reported profit and loss of Pi Life. Draft a brief note to the board covering the following:

- The likely impact on the publically available results of Pi Life at the time of the change;
- The likely impact on the profitability of the business written going forward; and
- The likely capital impacts of the proposed change

(6 marks)

c) Given your feedback, the Board has decided that it wants to make changes now to Pi Life's business to be ready for the change in accounting regime. In particular, the Board wants some ideas as to what actions it should take to protect Pi Life's profits at the time of the change and after the change.

In preparation for a meeting with the Board, prepare a list of options that the Board may wish to consider and the arguments for and against each of these options.

(10 marks)

d) As a result of your report and discussions, the Board is concerned that the proposed accounting treatment will not be appropriate for management reporting purposes. In particular, it is concerned that the new rules will not allow it to understand the drivers of the profitability of the business.

Detail two approaches that Pi Life could adopt for management reporting insight to the Board, Shareholders and investment analysts. For each approach what are the advantages and disadvantages.

(6 marks)

SOLUTIONS QUESTION 2

(a)

Adjusted Net Worth:

Assume that the adjusted net worth is calculated as the following:

ANW = Capital Base – (Prescribed Capital Amount + Target Surplus)

Which can we written as:

ANW = Capital Base – (Prescribed Capital Amount x 120%)

Given the means used to determine target capital.

Capital Base = Net Assets – Adjustments

Capital Base = 295m – (15m) – (200m – 50m) (where adjustment is the net of reinsurance DAC)

Capital Base = $160m

Hence

ANW = $160m – ($120m x 120%)

ANW = $160m – $144m = $16m

VIF:

VIF = Present Value of Cashflows + Present Value of Capital Releases (at the required rate of risk free + 8% pa = 11.5%pa).

PV of cashflows at 11.5% = $50m (as provided in the question)

PV of capital releases needs to be calculated:

The company, under the target surplus approach, is required to hold $144m of capital. This capital will be released over 20 years. Hence, $7.2 will be released each year over the next 20 years. Hence, the addition to VIF will be:

VIF Release of Capital = $7.2v + 7.2v^2 + 7.2v^3 + \ldots + 7.2v^{20}$ (assuming capital is released at the end of the year)

VIF Release of Capital = $55.5m

Hence,

VIF =$105.5m

ANW = $16m

EV = $121.5m

Marking Guide

- 2 mark for correct calculation of the required capital, capital base and hence ANW
- 1½ marks for correct calculation of the VIF
- ½ mark for correct calculation of the EV

To a maximum of 4 marks

(b)

FROM: Valuation Actuary

TO: Board

RE: Potential Impacts of Accounting Changes in Pi Life

I have reviewed the proposed changes to the accounting regime of Tau and its potential impact on Pi Life's business. Please see further detail under the headings below.

1) The likely impact on the publically available results of Pi Life at the time of the change

The current policy liability (net of reinsurance) is ($60m). This negative policy liability reflects the fact that the high initial acquisition expenses incurred for each sale are amortised over the life of the product (as long as they are supported by future premium margins).

However, under the proposed changes the up-front costs of issuing a product can only be deferred until the end of the premium rate guarantee (which is after the first policy year). Under the proposed change (assuming no transitional relief) the policy liability would not be able to be negative after the first policy year. This would result in a large increase in the policy liability and a one-off reduction in profit.

Consideration would also need to be given as to whether tax accounting will follow the proposed changes. If not, Pi Life may, at the time of the change, report a large accounting loss, but not have a tax loss if that basis does not change.

2) The likely impact on the profitability of the business written going forward;

The overall profitability of the business in real terms will not change. The accounting treatment and in particular the pattern of the accounting profit release will change however.

If business continues to be written with high up-front costs (including commission), the profit signature of each policy will change from one that currently shows profits emerging over the lifetime of the policy to one that will show a large loss at the end of the first policy year with larger profits in following years.

However, in the situation where the total business is neither growing nor shrinking, the overall profit may remain smooth (with losses in year 1 for new business being counteracted by larger profits in later years). However, in the situation that the company

considers a large drive in new business growth, losses will result in those years as acquisition costs are written off over that first year (and vice versa for a business that is reducing new business volumes).

3) The likely capital impacts of the proposed change

Given Pi Life has a capital regime consistent with that in Australia which treats any deferred acquisition cost as an inadmissible asset, there will be no impact on the capital base of Pi Life as a result of this change and hence no impact on the surplus asset position.

Marking Guide

½ mark for the use of appropriate language
½ mark for providing in appropriate memo format

1)
1 mark for noting and explaining the correct impact for Pi Life at the date of the change

Plus (up to a maximum of 1 additional mark)

½ mark for commenting on likely transitional relief

½ mark for discussion of tax treatment or any other reasonable commentary

2)

1 mark for noting that the underlying profitability does not change (just the accounting treatment)

1 mark for noting the accounting profitability impact on a single policy with high up front commission with reasonable discussion

1 mark for mentioning the accounting profitability when considering the business (including new business) and the impacts of increases / decreases in NB volumes.

3)

1 mark for noting no capital impact with a reason

To a maximum of 6 marks

(c)

List of Options for Board to Consider

1. Consider writing business with lower up-front commissions
   Pros:
   i. Will reduce the amount of DAC written off each year for new policies under the new standards
   ii. Removes the incentive for advisors to churn business – which may actually result in the underlying profitability improving
   Cons:

i. Advisors may stop writing business with Pi Life – reducing revenue base and may place pressure on expense margins

2. Consider writing business with longer premium guarantees than one year (e.g. 10 years or in line with underlying mortgage)
   Pros:
   i. DAC can be released over a longer period of time not resulting in first year losses for new business
   Cons:
   i. Capital requirements will be higher for these guarantees which would also likely result in an increase in the rates that need to be charged to the end customer
   ii. Increased risks in offering guaranteed products – may not suit risk appetite of Pi Life as only being considered due to accounting profit treatment (not to fix underlying profitability issue)

3. Consider reporting to shareholders' on a more appropriate basis (possibly in line with the current accounting basis) as well as that required under the new accounting regime
   Pros:
   i. Results are comparable to past results (under a regime that shareholders' are familiar in the case of the current accounting regime)
   ii. Results may better allow for the nature of the up-front financing in the business
   Cons:
   i. Shareholders' will need to understand 2 sets of accounts – may lead to confusion among investors
   ii. More work required in maintaining accounts on 2 bases

4. Reduce new business volumes - reducing new business volumes will have the effect (after the initial loss) of having higher profits emerging in future periods without large new business strain on profits
   Pros:
   i. Improved profit results (after initial losses) when new business volumes are falling
   Cons:
   i. Significant impact on the business due to accounting treatment (noting that underlying profitability is okay).

5. Consider using reinsurance. Reinsurers operating in Tau but incorporated elsewhere do not need to follow local accounting standards. Therefore, some reinsurers may be willing to offset more of the upfront acquisition costs of the policy.
   Pros
   i. The existing product structure (from the view of the consumer) will not need to be changed in order to offset the new accounting standards
   ii. It may reduce capital requirements, since a larger portion of upfront expenses are paid by reinsurers (again assuming no special capital

adjustment is enforced due to the concentration and type of reinsurance being taken out)

Cons

- This arrangement may not be allowed under Pi Life regulations, as it is a form of financial reinsurance (it may need special approval, as in Australia)
- This will likely be costly; reinsurers would want a higher portion of future profits to effect the deal
- Reinsurers may not be willing to take on the risk

Other acceptable options include:

- Suggestions of ways to reduce acquisition expenses – e.g. introduce a new product with lower acquisition expenses
- Sell through different distribution channel with lower initial commissions (e.g. Direct business)
- Reinsurance options that are clearly not financial reinsurance

Marking Guide

1 mark for each well explained option and ½ mark for each pro and con
If financial reinsurance mentioned, but without reference to regulatory requirements or need for appropriate risk transfer, then deduct 1 mark.

Do Nothing is not an acceptable answer as the question clearly says that the Board have decided to make changes.

To a maximum of 10 marks

(d)

Approach 1

Approach: Use an approach consistent with AIFRS approach

- Under this approach, initial acquisition costs and expenses are amortised and profit is released over time in line with a profit carrier

Advantages:

- Initial expenses are deferred and profits emerge smoothly over the lifetime of a policy
- Consistent with current approach – will continue to make sense to shareholders if reporting on this basis continues to be provided to shareholders (as well as the proposed new basis)
- Processes will be in place currently to report on this basis

Disadvantages:

- Approach depends on long term projections which involve a high degree of uncertainty (to support that the business should not be in loss recognition)

- Having two sets of accounts (one as required and maintaining the old approach) will require more systems / processes in place and will be more costly to produce

Approach 2

Approach: Change in Embedded Value Approach – under this approach management reporting will consider the change in the Embedded Value from period to period.

Advantages:

- Gets to the true profitability of the underlying business being written without having artificial accounting treatment impact on the results
- Changes in the value of the business from period to period are what management (and if publicised, investors) should be focused on

Disadvantages:

- Embedded Values are based on long-term projections. These projections include many assumptions and are hence based on highly uncertain future cashflows
- Even small changes in assumptions can impact the embedded value significantly and hence the management reporting may be subject to large amounts of noise and volatility.
- Embedded value calculations may not be completed as frequently as the accounting profits are currently reported to management. There may be significant costs (e.g. resources) required to increase reporting frequency to that required by the Board.

Another acceptable approach would be to report new business following the change and inforce business separately; given the different impact the change would have on the reported profit on each of these.

Marking Guide

1 mark for each approach

½ mark for each advantage / disadvantage

Maximum of 3 marks for each approach

To a maximum of 6 marks in total

END OF PAPER