COURSE 2A LIFE INSURANCE **SEMESTER 1 2016 MARKING GUIDE**

Question	Unit	Key performance outcome	Learning objective	Marks
1 a	1	1, 2	1.1, 2.2	15
1 b	1, 2, 3	3, 4, 7	3.3, 4.2, 7.3, 7.4, 7.5, 7.6	15
2 a	1, 2, 3	1, 6, 8, 9, 10, 11	1.1, 6.3, 8.3, 9.1, 9.2, 9.3, 10.3, 11.3, 11.4	15
2 b	2, 3, 4	7, 11, 13, 14	7.2, 11.6, 11.7, 13.1, 14.2	5
2 c	2, 4	5, 7, 12, 13	5.1, 5.3, 7.2, 12.1, 12.3, 13.1, 13.2	10
3 a	3	8, 9	8.1, 9.2	2
3 b	2	4, 5	4.2, 5.1, 5.2, 5.3, 5.4	5
3 c	1, 2, 3, 4	1, 3, 5, 8, 9, 12	1.2, 8.2, 8.3, 8.1, 9.5 3.3, 5.3, 5.4, 12.3	23

QUESTION 1 **(30 Marks)**

MakeGood Life is an Australian life insurer that has been selling investment linked business for 30 years. In the last few years it has experienced the following problems:-

- Loss of knowledge and expertise resulting from staff turnover
- A history of unit pricing errors requiring compensation to be paid

Your role as Head of Operations involves overseeing the calculation of unit prices as well as administration and customer service.

It has just been brought to your attention that a dividend payment included in net asset value (NAV) on 01/04/2016 for $21m was manually entered incorrectly as $12m. Consequently the opening NAV on 01/04/2016 has been understated by $9m and unit prices from 01/04/2016 to 04/04/2016 for MakeGood's Equity fund have been calculated incorrectly.

Your actuarial analyst has collected the following information for you.

- Funds under management and unit prices

Date	Opening NAV in $m	Unit price
01/04/2016	198.3452	2.0012
02/04/2016	199.4553	2.0124
03/04/2016	204.4010	2.0623
04/04/2016	182.4351	2.0521

- All unit prices are calculated at the start of the day based on opening NAV.
- On 03/04/2016 unit holder X redeemed his account. His opening balance at 01/04/2016 was $20,435,200.
- There were no other deposits or withdrawals between 01/04/2016 and 03/04/2016.
- For simplicity assume no transaction fees, buy/sell spreads or tax.

a) MakeGood Life intends to rectify this mistake by recalculating unit prices and restoring investors to the position they would be have been in had the error not occurred. In addition, MakeGood's standard practice for unit pricing compensation is to pay interest at a rate of 5% per annum effective.

Calculate the correct NAV and unit prices from 01/04/2016 to 04/04/2016 and determine the compensation payable to unit holder X as at 04/04/2016. State any assumptions that you make. **(15 marks)**

b) MakeGood Life's newly appointed Managing Director, who is also new to life insurance, says

"a history of unit pricing errors suggests an issue with people, processes or systems. I would like to explore the option of outsourcing policy administration and unit pricing to an external third-party provider."

Explain what risks relating to people, processes and systems MakeGood would be exposed to if it outsources its administration and unit pricing functions and describe what mitigating action could be taken to manage these risks? **(15 marks)**

MARKING GUIDE

a)

Unit pricing error compensation

Date	Adj	NAV (opening)	Units	Unit Price	Cashflow
01/04/2015	9	207.3452	99.1131	2.0920	
02/04/2015		208.5056	99.1131	2.1037	
03/04/2015		213.6758	99.1131	2.1559	-21.0591
04/04/2015		191.6640	89.3449	2.1452	

Unit holder X on 04/04/2015

Compensation	NAV in $m	Unit Price	Units
OLD	21.0591	2.0623	10.2115
New	22.0147	2.1559	10.2115
Cash due	0.9556		
Interest	0.0001		
Total due	**0.9557**		

Corrected NAV and unit prices
4 marks for corrected NAV (as per table above), ie 1 mark per date. Deduct 1 mark if students do not apply investment earnings to the $9m adjustment.
2 marks for correct unit prices (as per table above), ie 0.5 marks per date
Total 6 marks

Compensation for Unit holder X
2 marks for calculation of units (10.2115)
2 marks for actual NAV redeemed (21.0591)
2 marks for correct NAV redeemed based on 03/04/2015 unit price (22.0147)
1 mark for cash due before interest (0.9556)
2 marks for total due with interest (0.9557)
Total 9 marks

Total 15 marks

b)

Operational risk

Calculation of unit prices, administration and customer service will be transferred to a third party. This creates an overarching risk that failure of the outsourcer's people, processes or systems results in it not delivering on its obligations. This could lead to customer dissatisfaction and complaints which could result in loss of business and damage to MakeGood's reputation. (1 mark)

This overarching risk could be managed by entering into a legally binding outsourcing agreement (as required by CPS 231, paragraph 30). (1 mark)
Formalising the conditions of the agreement would help to manage expectations and clarify actions if something goes wrong. (0.5 marks)
An outsourcing agreement should cover the items listed in paragraph 31 of CPS 231. (0.5 marks)

The following table outlines in more detail ways in which this overarching risk could arise:-

Risk	Management
There is a risk the outsourcer may over-sell their capabilities and experience in order to win the business and then may not be able to deliver on requirements once the agreement is put into effect. (1 mark)	Undertake due diligence prior to entering into a contract to assess whether the third party provider is fit to complete the task. (1 mark) This should cover financial strength, credit rating, current skills / staff levels, suitability of unit pricing and other systems, track record and interviews with any third parties already using company. (0.5 marks) MakeGood should also continue to monitor these items after the agreement commences. (0.5 marks)
MakeGood will no longer have direct control over recruitment, training or supervision of employees; execution of processes; or systems integrity and operation. All of these factors mean there is a risk of errors, delays or reduced quality of service. (1 mark)	MakeGood's Management will need to rely on other indicators to assess performance against service standards, such as number and reason for customer complaints, call centre volumes or turnaround times. (1 mark) MakeGood and the outsourcer should agree service levels and performance requirements at outset and include a service level agreement (SLA) in the outsourcing agreement. (0.5 marks)
There is a risk this organisational change will be a distraction from revenue generating activities and negatively impact business culture, especially if redundancies are likely. (1 mark)	MakeGood's revenue generating staff should be ring fenced and redundancies and related communications should be effectively managed. (0.5 marks) Where possible MakeGood should try to assist staff to transfer to the third party, if opportunities present. (0.5 marks)
In recent years MakeGood has experienced staff turnover and a loss of knowledge, which may explain recent unit pricing errors. There is a risk that outsourcing will not correct these issues. The outsourcing provider may still have a problem with turnover and as a result loss of knowledge. (1 mark)	MakeGood should request the outsource provider monitor and report on staff turnover in addition to undertaking exit interviews to understand reasons for leaving. (0.5 marks) MakeGood should invest appropriately skilled resources to document processes

	and ensure this document is peer reviewed and signed off. MakeGood should agree with the outsourcer that this documentation be regularly reviewed and updated. (1 mark)
There is a risk inadequate training or handover will mean the outsourcer does not have the necessary tools to fulfil its obligations leading to errors, increased turnaround times or poor quality service. (1 mark)	MakeGood should provide comprehensive training to the outsourcer, including transfer of current staff on a temporary basis. (1 mark)
There is a risk there will be inadequate controls in place to ensure the accuracy of unit prices. Errors could increase compensation costs and lead to further reputational damage. (1 mark)	Run parallel pricing for a period of time to ensure outsourcer's unit pricing systems are working as they should. (0.5 marks) Undertake in house monitoring and checking of unit pricing so errors or issues can be identified quickly. (0.5 marks) Develop and agree detailed processes for dealing with errors and compensating customers prior to entering into an outsourcing agreement. (0.5 marks)
There is a risk that a system outage or other disasters at the outsourcer's location could result in a disruption to service. (1 mark)	The outsourcer should have a recovery site and business continuity plan and this information should be included in the outsourcing agreement. (1 mark)
Data related to policy administration is being transferred from MakeGood to the third party provider. This creates a risk of delays or errors. (0.5 marks)	There should be thorough testing of data before and after the transfer. (0.5 marks) Data could be transferred in tranches and outside of business hours to reduce the risk of disruption to service. (0.5 marks) Maintain ability to clawback changes if errors are identified. (0.5 marks)
There is a risk of breaches to data security which could have a negative impact on MakeGood's reputation. (1 mark)	The outsourcing agreement should cover how the third party ensures security of data and information. (1mark)

1 mark for any other point well explained.

Max 15 marks

QUESTION 2 **(30 marks)**

BigLife is a large Australian life insurance company operating in the Australian individual risk protection business.

Recently it has been struggling to write business at a margin that meets its target requirements and, in the last few years, has lost market share. In order to continue to grow its business, Senior Management is exploring options for entering new markets.

As BigLife's Product Development Actuary you have been tasked with investigating this.

An analyst in your team suggests that BigLife starts to use digital (online) marketing to sell yearly renewable term (YRT) products direct to consumers.

"We could even develop an app so people can buy insurance using their smart phone or tablet!

We could target new families as they have an insurance need and probably don't have time to see a financial adviser anyway."

He also suggests that, given BigLife already sells retail term business, existing assumptions could be used for pricing the direct YRT product.

You would like to do some preliminary analysis to be used in a proposal for Senior Management.

To assist you, your analyst has prepared a simple projection model using BigLife's current assumptions and premium rates for retail YRT for a male, non-smoker age 40 years (see C2A_2016_S1_Q2a.xlsx).

He has also obtained the Actuaries Institute graduated mortality rates 2004-2008.

In addition he has gathered the following information for you in relation to this new direct YRT product.

- The product will be sold online only, with no adviser, telemarketing or call centre involvement.
- The product will be subject to short form underwriting covering smoker status, occupation, pre-existing conditions, recent medical investigations and family history. No medical test will be required.
- IT and other set up costs are estimated to be $1.5m.
- Annual advertising and marketing costs are estimated to be $0.5m.
- Sales targets per annum: 2,000 policies.
- Expected average sum insured: $250,000.
- The product is expected to be on sale for 5 years.
- No commission will be payable.

a) Propose expense, lapse, mortality, investment return and risk discount rate assumptions for pricing this direct YRT product. Justify your recommendations and, where needed, explain why direct YRT assumptions should differ from retail YRT. **(15 marks)**

b) Modify your cashflow model to reflect these new assumptions and prepare a table that compares the present value of cashflows and the internal rate of return (IRR) for each step change in assumptions. Explain the impact of each assumption change on profitability. **(5 marks)**

You may assume that

- Premium rates remain unchanged from those used for retail YRT
- Premiums are received at the beginning of the year and claims are paid at the end of the year
- BigLife's hurdle rate for new products is 12%
- Adviser commission has been removed and the average sum insured has been updated in the model

c) Discuss options available to BigLife to address the profitability issues you identified in part b). **(10 marks)**

MARKING GUIDE

a)

Assumptions for Direct YRT

(i)

Expenses

Retail YRT assumption	Direct YRT assumption	Explanation
Acquisition % prem: 10% $ per pol: $300	**Acquisition** $ per pol: $900	**Acquisition** A % per pol acquisition unit cost assumption is used for retail YRT as costs, particularly underwriting, vary depending on level of cover. The cost to acquire direct YRT is the same regardless of case size as such using only a $ per policy assumption is justified. (1 mark) Acquisition costs for direct YRT would include ➢ Annual advertising and marketing costs $0.5m pa / 2000 pols = $250 per policy (0.5 mark) ➢ New business administration and customer service $50 per policy This is an estimate of the cost of time spent by staff incurred in issuing a policy taking into consideration the fact the product is sold online. (0.5 mark) ➢ Share of development costs $1.5m / 2000 pols / 5 years = $150 per policy These costs are an acquisition expense and are independent of policy size. The total cost has been spread over the total number of new policies BigLife expects to sell assuming the product will be open to new business for 5 years and 1000 policies will be written each year. (0.5 mark) ➢ Share of other overheads $50 per policy

Renewal % prem:10% $ per pol: $50	**Renewal** $ per pol: $75	This is based on the assumption that acquisition $ per policy expenses reflect the cost of acquisition overheads allocated to the product. (0.5 mark) 250 + 50 + 150 + 50 = 500 **Renewal** Similar to acquisition costs, costs incurred in renewing business would be independent of policy size and as such only a $ per policy assumption has been used. (0.5 marks) Nonetheless, maintenance expenses for direct business may be higher than retail. For retail business, some customer service type functions would be handled by advisers, whereas for direct these services may need to be provide BigLife. (1 mark) Maintenance expenses for direct would include ➢ Ongoing customer service and policy administration $50 per policy Assumes policy administration and customer service costs of $30 per policy increased to allow for additional service not covered by advisers. (0.5 marks) ➢ Share of overheads $50 per policy This is based on the assumption that renewal $ per policy expenses reflect the cost of general overheads allocated to the product, which would be applicable for all years. (0.5 marks) 50 + 50 = 100 **Expense inflation** No reason to think expenses for direct would escalate at a different rate to retail YRT. (0.5 marks) Max 6 (3 + 2.5 + 0.5) marks Award marks if students justify different $ assumptions as long as they discuss the relevant
Expense inflation 2%	**Expense inflation** 2%	

		components. Do not award marks for % expenses unless the student is able to present a strong case for expenses varying by policy size. Award marks if student allocates part of marketing costs to renewal as long as they justify that this is related to retaining business and majority of cost is allocated to acquisition.

Lapse

Retail YRT assumption	Direct YRT assumption	Explanation
Year 1 = 5% Year 2 = 13% Year 3 = 10% Year 4+ = 8%	Year 1 = 40% Year 2 = 30% Year 3 = 20% Year 4+ = 16%	An assumption of 40% has been used for year 1 as we expect buyers of direct to be heavily influenced by advertising. As buyers are unlikely to have received specialised financial planning advice, they are more likely to subsequently discover that the product is not suitable. (1 mark) Insurance is thought of as a product that is sold rather than bought. This emphases the value of financial advice and may mean lives that purchase a direct marketed product are less engaged in or convinced of its value. (0.5 mark) In comparison, year 1 lapse rates for retail YRT are commonly artificially low due to the existence of commission responsibility periods, which are generally 1 year but will increase to 2 years from the introduction of the Life Insurance Framework from 1 July 2016. (1 mark) From year 2 + assume lapses are 200% of retail YRT rates. This to reflect the fact lives have not sought financial advice to ensure the product continues to be suitable for their needs. In addition, premium rates for direct YRT tend to be higher than their retail comparison. Affordability may push up lapse rates. (1 mark) Max 3 marks Expect students to identify that direct products have - a different pattern - high year 1 lapses (at least 25%) - higher lapses for remaining years. (Award marks if student proposes a multiple different to 200% as long as this is higher

		than retail.)

Mortality

Retail YRT assumption	Direct YRT assumption	Explanation
IA 04-08 Year 1 40% Year 2 60% Year 3 80%	IA 04-08 Year 1 80% Year 2 90% Year 3 100%	IA 2004-08 is an insured lives mortality table derived from industry experience from 2004 to 2008 for fully underwritten standard lives. Direct YRT is subject to short form underwriting and as such using an insured lives mortality table is justified. (1 mark) Multiples of this table adopted for retail YRT are lower than those proposed by the 2008 Lump Sum Investigation (Y1:60%, Y2: 80%, Y3+100%) which would suggest ➢ Actual mortality experience for retail YRT is better than the industry ➢ Product design and underwriting requirements justify weaker assumptions ➢ Allowance for improvements in mortality for period 2004/08 to today which could justify about 10% lighter mortality. Apart from mortality improvements, the same would not necessarily apply to direct YRT. (1 mark) Underwriting for direct YRT is less onerous than the assumed level of underwriting of the lives underlying IA 04-08. This means anti-selection may be greater with direct than that assumed by the 2008 investigation when setting selection effects for IA 04-08. Therefore a multiple of 80% (rather than 60%) for year 1 is proposed for direct YRT. (1 mark) The 2008 investigation recommends 100% of the table for ultimate mortality rates. At this point the benefits of underwriting are assumed to have worn off. Without evidence to suggest otherwise, the same ultimate rate (100%) is proposed for direct YRT. (0.5 marks) A multiple of 90% has been selected for year 2 as a midpoint between year 1 and ultimate rates. (0.5 marks)

		Max 4 marks Award marks if students propose no selection or anti selection. Award maximum 1 mark for this assumption if students justify use of industry table but suggest same selection as retail. Award marks if students suggest using a population mortality table instead. (Note: ALT is not provided in the accompanying spreadsheets).

Investment returns

Retail YRT assumption	Direct YRT assumption	Explanation
4%	4%	Investment returns assumptions are based on the yield expected to be earned on assets backing liabilities. Reserves for both retail and direct YRT would be invested in similar assets (relatively short term, liquid assets such as bank bills, government and semi-government bonds and highly rated corporate bonds.) Therefore the same assumption for both products is justified. 1 mark

Risk discount rate

Retail YRT assumption	Direct YRT assumption	Explanation
12%	12%	Risk discount rates are used to value future transfers to shareholders (distributable profits) or otherwise called transfer values. A discount rate of 12% reflects the minimum rate of return or hurdle rate that BigLife's shareholders require on the capital they invest. (1 mark) No information is provided in the question to suggest shareholders would require a higher return on new business capital outlays for direct YRT in comparison to retail YRT. Therefore the same assumption for both products is justified. (0.5 mark) Max 1 mark

Expenses	Max 6 marks
Lapses	Max 3 marks
Mortality	Max 4 marks
Investment	1 mark
returns	1 mark

Risk discount rate
Total 15 marks

b)

	Premium	Pol Fee	Claims	Acq Exp $	Acq Exp %	Ren Exp $	Ren Exp %	Comm Upfront	Comm Renewal	Reserves	Interest	Tfr Value	IRR
Retail	1549	304	732	300	30	225	108	199	67	1858	99	5	12%
Direct													
Commission	1549	304	732	300	30	225	108	0	0	1858	109	252	25%
Expenses	1549	304	732	500	0	449	0	0	0	1858	99	-14	12%
Lapses	659	161	277	500	0	180	0	0	0	790	33	-195	0%
Mortality	658	161	396	500	0	180	0	0	0	790	33	-314	-5%

1 mark for correct results for proposed assumptions
0.5 marks for table presentation

All assumption changes have a negative impact on transfer values. Using a risk discount rate of 12%, the present value of transfers is negative meaning that the product fails to meet shareholders' hurdle requirement. (0.5 marks)

BigLife is exploring the option of entering new markets in order to improve margins. If experience is in line with the proposed assumptions, a loss would be made on this product. This would not be acceptable and clearly would not achieve BigLife's objective. (0.5 marks)

The pattern of profits for individual risk business is characterised by a large negative cashflow at the start of policy followed by small positive cashflows over the life of the policy. In the case of direct YRT, this large negative arises because of development costs and annual marketing and advertising spend. Shareholder capital is required to fund this new business strain. Shareholders require a return on their investment in excess of the hurdle rate and as such the present value of the small positive cashflows, discounted at the hurdle rate, needs to equate to this initial outlay. If the product meets the hurdle requirement the PV of transfers would equal zero. (1 mark)

Direct YRT is characterised by high lapse rates, particularly in year 1. In order for a risk product to be profitable it needs to remain in force for sufficient time for the capital strain to be repaid. High lapse rates early in the life of a policy mean shareholders' initial outlay is not repaid meaning a loss would be incurred on this business. In the model this is reflected by lower premium income being received for the model point. (1 mark)

Increasing mortality increases claims costs which further reduces transfer values. Higher mortality also has a second order impact on premium income, as fewer lives are in force, although in this model, the impact of higher mortality is being dwarfed by high lapses in year 1. (0.5 marks)
(1.5 marks for modelling, 3.5 marks for explanation)

Total 5 marks

Award 1.5 marks for modelling if assumptions differ from model answer where results can

be replicated with solution spreadsheet.

Award 0 marks for modelling if student clearly has not sense checked results (ie numbers are obviously unreasonable for proposed assumption changes)

Explanations that identify that the product is less profitable than retail through to loss making are acceptable. Award up to the full 3.5 marks if explanation is consistent with proposed assumption change and corresponding results.

Award maximum 1.5 marks for modelling and 0 marks for explanation if student proposes that product is more profitable than retail using retail premium rates.

Award maximum 1.5 marks for modelling and 0.5 marks for explanation if student only describes movement of results. Expect students to explain why results have moved with reference to profit signature and interaction between assumptions.

c) Options

1) Increase premium rates

Premium rates would need to be increased significantly in order to achieve a 12% return.

BigLife may experience difficulties marketing a product that is so much more expensive than a similar product sold through an adviser. As a result the product may only be attractive to lives in ill health that would not pass long form underwriting. Otherwise BigLife would need to rely on the assumption that customers may not be aware they could get a better price through an adviser. Having premium rates that are expensive would lead to the product being less affordable, which would have an adverse impact in lapse rates.

(1 mark)

2) Reduce mortality assumptions

BigLife could consider what product features or terms and conditions it could implement to manage anti selection risk. In the absence of full medical underwriting, BigLife could mitigate this risk by

- using an interim period (eg 12 months) where claims by accidents are covers, but not suicide or illness
- excluding pre-existing conditions for a longer period (eg 3 years)
- excluding specific occupations, pastimes or other activities
- setting a maximum sum insured
- seek advice from reinsurer in an attempt to reduce uncertainty around assumptions

1 mark per suggestion above or any other reasonable suggestion
Max 2 mark

3) Lower lapse rates

BigLife could explore ways to improve lapse rates as outlined below.

- Clearly communicate terms and conditions, particularly exclusions and waiting periods. The online quoting process could ask applicants to tick they agree to conditions in a 'What do I need to know' section.

- Increase customer service at point of sale. Representatives could make courtesy calls to discuss the product, although would need to be careful about not offering financial advice.
- Have online calculators available at point of sale that let applicants calculate how much cover they can afford.
- Have a retention team who can:
    - contact customers whose premiums have dishonoured to see if the issue can be rectified (eg expired credit cards or incorrect account numbers)
    - discuss affordability with customers and offer solutions such as reducing the amount of cover to something more affordable, offering temporary premium waivers or payment holidays for customers with temporary affordability issues (eg in between jobs)
- Have the ability to match or beat competitors' prices if a customer is cancelling to switch to a competitor product

1 mark per suggestion above or any other reasonable suggestion
Max 3 mark

4) Improve effectiveness of marketing

BigLife could try to increase the cost efficiency of marketing spend by either

- Reducing creative development costs and/or reducing annual spend on advertising and marketing.
- Undertake creative development in house so as to reduce reliance on external consultants or agencies.
- Improve the conversion rate for quotes so as to sell more policies and be able to spread acquisition costs over a larger base, for example refer applications for full underwriting rather than rejecting if short form underwriting questionnaire identifies health issues.
- Request contact details (eg phone numbers) when quoting and have customer service representatives follow up quotes that do not complete, however new business administration costs would also need to be adjusted accordingly.
- Undertake market research and use reference groups to ensure marketing strategies reach the target demographic.

1 mark per suggestion above or any other reasonable suggestion
Max 3 mark

5) Do not proceed

Lastly, BigLife may decide not to proceed with this offering because of the risk of not recouping the large development spend and the risk of anti selection.

1 mark

Award 1 mark for any other suggestion that is well explained

Maximum of 10 marks

QUESTION 3 **(30 marks)**

IndyGrp Life Insurance is a medium sized Australian life insurer that has been operating in the individual protection market for over 15 years. It entered the group life insurance market 5 years ago.

Being a relatively new player in the group market, IndyGrp's strategy is to focus on growth by increasing its market share. IndyGrp prices aggressively and quotes on a range of business. It has built a reputation in this market as an insurer that offers very competitive terms to blue collar workers, in particular miners.

You are IndyGrp's Experience Actuary and your role is to monitor experience for individual and group business.

Your actuarial analyst has prepared the following preliminary experience analysis for you in relation to IndyGrp's individual and group total and permanent disability (TPD) business.

Table 1. Actual to expected morbidity claims amounts - individual TPD business

2015	2014	2013	2012	2011
1.15	0.95	1.02	1.01	0.99

Table 2. Loss ratios – group TPD business

2015	2014	2013	2012	2011
1.25	1.07	0.98	0.96	0.88

Other information

- The actual to expected ratios in Table 1 represent the total actual claims divided by the total expected claims. Expected claims are derived using best estimate assumptions. These ratios have been calculated based on claim amounts.
- The loss ratios in Table 2 have been calculated as the cost of claims divided by the earned premium for each period.
- Results are gross of reinsurance.
- For all pricing tenders, IndyGrp targets a loss ratio of 0.85 for group TPD business.
- In 2015, IndyGrp paid a $10m (gross of reinsurance) TPD claim to a racing car driver who suffered a catastrophic head injury in a skiing accident. This is IndyGrp's largest payout for individual TPD in its history.
- In December 2012, IndyGrp won a tender for a large group superannuation scheme. Prior to this, the scheme was insured by a competitor. Experience data for this deal was poor when it was priced in July 2012. At the time of pricing there were concerns about incomplete data and delays in reporting claims, however this was not followed up once the deal was completed.
- During 2015 demand for commodities fell sharply signalling the start of a downturn in the mining industry in Australia.

a) Explain why loss ratios are used to monitor experience for group business whereas actual to expected analyses are used for individual risk business. **(2 marks)**

b) Compare and contrast underwriting for group and individual risk business and discuss the implications of this for group business. **(5 marks)**

c) The Head of Products has asked for your opinion on IndyGrp's TPD experience. Draft a memo covering the following:-

- Identify the features of individual and group TPD experience that concern you and provide possible explanations for your observations. **(4 marks)**

- Outline what additional information you would require and explain how this additional information could help you. **(6 marks)**

- Suggest recommendations for existing and future new business based on your findings. **(13 marks)**

(Total 23 marks)

MARKING GUIDE

a)

- Group business is written on a price per scheme basis and as such insurers may not have access to information on individual lives. When individual policyholder information (age, sex and SI) is not available, it is not possible to calculate E and so we cannot undertake A/E analysis. (1 mark)
- Pricing basis for individual business usually includes detailed assumptions to estimate claims on an individual basis which can be aggregated. The pricing basis for group business is usually calculated on an overall loss ratio basis for the scheme. (1 mark)
- For group business, a lack of industry experience studies or data may mean a credible expected basis cannot be derived. Without this E's cannot be calculated. In contrast, industry mortality and morbidity tables are readily available for individual business. (1 mark)
- Reserving for group business is on an unearned premium basis. Premiums are paid in advance, and if experience is as expected, one year of premiums should be sufficient to cover that year of claims. Using a loss ratio is comparable to the approach used to reserve for this business. (0.5 marks)

Max 2 marks

b)

Underwriting and anti selection

- For individual risk business, each applicant undergoes an UW assessment before cover is offered. The insurance application form covers personal and policy information, medical information, non-medical aspects and financial information. Applicants may also be required to undertake medical tests, such as bloods, ECG, medical exam or provide a doctor's report. (0.5 marks)
- Conversely, group insurance is arranged with the provision of acceptance of new entrants into the group without evidence of health. Cover is offered automatically up to the predetermined automatic acceptance level (AAL). Entry is available at a specific time, eg 3-6 months after becoming eligible (eg commencing employment). Only requests for cover above the AAL are underwritten in a similar way to individual business and non standard terms only apply to amounts above the AAL. Amounts below the AAL are accepted regardless of health. (0.5 marks)
- The implication of this is that anti selection is greater with group business as lives could be accepted into a group scheme up to the AAL that may not be eligible for cover on an individual basis. (1 mark)

Underwriting and pricing

- Upon completion of individual underwriting, insurance cover will offered on standard terms, loaded, excluded, declined or deferred. Premium rates payable by the individual will be adjusted to reflect this decision, so each individual life pays a premium commensurate to their level of risk. (0.5 marks)

- Premiums and the AAL for a group scheme are determined as part of the tender process and are guaranteed, usually for 3 years. Group plans as a whole are underwritten using occupation as a rating factor. Past claims experience, the number of persons covered, wages, occupational hazards, gender and age of each member of the scheme are also considered. (0.5 marks)
- Pricing of group therefore relies on cross subsidy as the cost of cover is independent of individual risk factors. (0.5 marks)
- For group business this means that quality and completeness of information provided as part of a tender, particularly past claims experience, is essential for understanding the risk and setting a price and conditions of cover. (1 mark)
- Similarly, when relying mainly on occupation to underwrite group business, insurers need to assess concentration risk, for example exposure to miners, when deciding whether to pursue new business. (1 mark)

1 mark for any other implications, reasonably explained

Max 5 marks

c)

What do we expect to see

A/E	We expect A/E to be 1 if actual claims are as expected. A/E > 1 means actual claims are more than expected using current best estimate assumptions. This would lead to an underwriting loss.
Loss ratio	We expect loss ratios be similar to those used at pricing. If actual ratios are greater than pricing ratios, then there is a risk that premiums will be insufficient to cover claims and other expenses. This scenario would erode profit and, depending on the severity, could lead to an underwriting loss.

MEMO

To: Head of Products
From: An Actuary
Date: DD/MM/YYYY

Subject: Morbidity experience for individual and group TPD

Please find below a summary of my initial observations, further investigations and recommendations regarding experience for IndyGrp's individual and group TPD.

Observation

Individual TPD	Group TPD
Apart from 2015, experience is broadly in line with expectations. In 2015 actual claims were materially more than	Between 2011 and 2015 loss ratios have progressively increased. Since 2012 loss ratios have exceeded pricing targets and since 2014, the cost of claims has been more than earned premiums. This means that in 2014 and 2015 premiums were insufficient to cover claims cost and expenses. IndyGrp is

expected claims. (0.5 marks) During 2015 IndyGrp paid out a large ($10m) TPD claim, which may explain this poor experience. (0.5 marks)	making a loss on this business. (0.5 marks) Part of the poor experience since 2013 is likely related to the large group superannuation scheme that IndyGrp won at the end of 2012. (0.5 marks) At the time of pricing there were concerns about data and late reporting, although no data true up occurred after the deal was put onto IndyGrp's books. It is possible that IBNR/RBNA assumptions were incorrect at pricing, which could mean expected claims were undervalued. (1 mark) IndyGrp prices aggressively suggesting it may be at risk of under pricing. Similarly it has a reputation for offering competitive terms to blue collar works, particularly miners. The nature of these professions means they are at greater risk of disability than white collar workers. If the increased claims risk was not fully reflected in past claims experience, actual cost of claims could have been undervalued at pricing. Both of these factors could explain observed trends in loss ratios. (1 mark) Given IndyGrp has only been writing group business for 5 years, volatility in results is not unexpected. Similarly, credibility may be a consideration when drawing conclusions (0.5 marks)

Max 1 marks for individual
Max 3 marks for group
Total 4 marks

Additional information

Individual TPD	**Group TPD**
Identify the large TPD claim and assess A/E results with this claim excluded to verify this is driving poor results. (0.5 marks) Moving forward, A/E analysis on a lives basis, in addition to amounts, would be helpful to identify where large claims have skewed results. Amounts analysis can be volatile where a small number of policies have large claim amounts. (1 mark) Results on both a gross and net of reinsurance basis would help to identify the effectiveness of reinsurance arrangements at transferring insurance risk, particularly large claims. (Surplus and/or stop loss would be more effective at dealing	Splitting results by scheme to ascertain which schemes (and/or professions) are causing problems would be helpful. This could help to validate if experience for this large super scheme is driving these results. At the same time it would help to identify any schemes that are performing in line with expectations. (1 mark) If information is available, splitting results by reason for claim would be helpful to ascertain which medical conditions are driving results. (A/E analysis for individual business by condition would be useful too). (1 mark) Economic cycles may, in part, explain recent results and splitting results by reason for claim or scheme may help to identify this. In 2015 there was a significant drop in commodity prices coinciding with a downturn in the Australian mining industry. Miners may attempt to claim for

with large claims than quota share.) (1 mark) Number of deaths would be helpful to assess the credibility of results. The square root of N could also be used to estimate standard deviation and hence confidence intervals. Confidence intervals would help to understand the potential range of results within a tolerance level. It could also help with managing the business, eg setting best estimate assumptions, reinsurance terms and capital. (1 mark)	TPD if they fear losing their jobs. (1 mark) Should check if any group schemes have been re-priced or if there has been a change in member profile. Both of which would impact premium rates, and so could distort loss ratios. (1 mark) Consideration should be given to industry experience. IndyGrp could seek advice from its reinsurer to confirm expectations. (0.5 marks) IndyGrp could investigate IBNR/RBNA to assess whether delays are consistent with pricing assumptions. (0.5 marks)

Max 2 marks for individual
Max 4 marks for group
Total 6 marks

Recommendations

There appears to be an ongoing issue with experience and the adequacy of premium rates for group business.

1) Strategy

- Intense competition and focus on revenue generation rather than value has meant IndyGrp prices aggressively in order to win business. In this scenario there is a risk of bad claims experience as the business ages. (1 mark)
- In light of recent experience and the fact IndyGrp has been operating in this market for 5 years and so is no longer a new player, it may wish to reconsider its strategy and pursue value rather than volumes. (1 mark)

2 marks

2) Data

- Prudential Standard SPS 250, Insurance in Superannuation, paragraph 15 requires superannuation schemes to maintain records for at least the previous five years on "claims experience, membership, sum insured and premiums paid in relation to beneficiaries." Transition arrangements for implementing this data requirement ends 1 July 2016, (paragraph 30). This may help to address the issue around data quality for future deals. (2 marks)
- IndyGrp should review exiting contracts to determine what remedial action can be taken if data errors or omission are subsequently discovered. All new contracts and renewals could include this provision. (1 mark)
- Going forward, IndyGrp could review its due diligence methodology. It could also establish the right to undertake audits post appointment and the reserve the right to adjust pricing should significant discrepancies be identified. (1 mark)

4 marks

3) Premium guarantee

- Premium rates on existing business are guaranteed until the end of the term of the contract (usually 3 years) after which the business will be re-tended and IndyGrp will be able to either
  (i) Not renew the business
  (ii) Increase premium rates
  (iii) Reduce cover (eg AAL)

1 mark

4) Claims management

- In light of the fact premium rates for group business are guaranteed, IndyGrp could review claims management practices to ensure only valid claims are paid, for example
  - Review resourcing to ensure the number of claims per assessor is reasonable and claims assessors have appropriate supervision and training
  - Work with employers to improve occupational health and safety
  - Encourage and incentivise early reporting of claims
  - Rehabilitation and surveillance, where appropriate

0.5 marks per point

0.5 marks for any reasonable suggestion relevant for TPD. Do not award marks for suggestions relating to improving claims for temporary disability.

Max 2 marks

5) Risk transfer

- IndyGrp could attempt to increase reinsurance cover or sell the risk to another third party provider. (0.5 marks)
- In light of existing experience it would be difficult to find a reinsurer/third party willing to accept this business on terms that are acceptable. (0.5 marks)

Max 1 mark

6) Pricing methodology

- For new contracts, IndyGrp could consider the following changes
  - Are policy terms and conditions, eg definitions of TPD and waiting periods too generous?
  - Could AALs be reduced?
  - Could certain conditions be excluded from cover or benefits reduced? However this would need to be balanced against loss of competitiveness and reputational risk, especially if IndyGrp is pursued for discrimination.
  - Greater use of profit share arrangements
  - Spending more time and/or resources on the tender process
  - Incorporate prior assumptions and credibility theory into pricing methodology, particularly where data is poor.
  - Reduce premium rate guarantee period from 3 years to 1-2 years
  - Increase premium rates

(0.5 mark per point)

Max 2.5 marks

0.5 marks for memo format

Max 13 marks

Total 23 marks (4+6+13)