INSTITUTE OF ACTUARIES OF AUSTRALIA

COURSE 2A LIFE INSURANCE **OCT 2007 EXAMINATIONS**

MARKING GUIDE

Level of Difficulty

Question	Syllabus Aims	Units	Knowledge & Understanding	Straight-forward Judgement	Complex Judgement	Total Marks
1 (a)	1, 2, 3	1	3		1	4
1 (b)	2, 3	1	3			3
1 (c)	1, 2	1		5		5
1 (d)	1, 2	1			3	3
1 (e)	1, 2, 3	1			3	3
1 – Totals	**1, 2, 3**	**1**	**6**	**5**	**7**	**18**
2 (a)	5, 8, 9	2, 3	4			4
2 (b)	2, 5, 7, 9	1, 2, 3		3	3	6
2 (c)	2, 4, 5, 7	1, 2		3		3
2 (d)	2, 5, 9	1, 2, 3			3	3
2 – Totals	**2, 4, 5, 7, 8, 9**	**1, 2, 3**	**4**	**6**	**6**	**16**
3 (a)	1, 5, 8	1, 2, 3	2	2		4
3 (b)	2, 4, 8	1, 2, 3		3		3
3 (c)	6, 8, 9	2, 3	2	2		4
3 (d) (i)	4, 6, 7, 8	2, 3			3	3
3 (d) (ii)					2	2
3 – Totals	**1, 2, 4, 5, 6, 7, 8, 9**	**1, 2, 3**	**4**	**7**	**5**	**16**
4 (a)	1, 2, 5, 12	1, 2, 4	2			2
4 (b)	1, 2, 5, 12	1, 2, 4		4		4
4 (c)	9, 10, 12	3, 4		2		2
4 (d)	1, 5, 12	1, 2, 4			6	6
4 (e)	4, 9, 12	2, 3, 4			4	4
4 – Totals	**1, 2, 4, 5, 9, 10, 12**	**1, 2, 3, 4**	**2**	**6**	**10**	**18**
5 (a)	8, 13, 14	3, 4	1			1
5 (b)	2, 13, 14	1, 4		2		2
5 (c)	1, 3, 13, 14	1, 4	3			3
5 (d)	8, 13, 14	3, 4		2		2
5 (e)	1, 4, 13, 14	1, 2, 4		4		4
5 (f)	8, 13, 14	3, 4			5	5
5 – Totals	**1, 2, 3, 4, 8, 13, 14**	**1, 2, 3, 4**	**4**	**8**	**5**	**17**
6 (a)	4, 15, 16	2, 5		6		6
6 (b)	4, 7, 15, 16	2, 5		4		4
6 (c)	8, 14,15, 16	3, 4, 5		2	3	5
6 – Totals	**4, 7, 8, 14, 15, 16**	**2, 3, 4, 5**		**12**	**3**	**15**
TOTAL	**1 to 16 inclusive**	**1, 2, 3, 4, 5**	**20**	**44**	**36**	**100**

QUESTION 1 (18 Marks)

Analysis

Component	Aim	KU	SJ	CJ	Total
Part a)	1, 2, 3	3		1	4
Part b)	2, 3	3			3
Part c)	1, 2		5		5
Part d)	1, 2			3	3
Part e)	1, 2, 3			3	3
Total	**1, 2, 3**	6	5	7	18

Question

You are an actuary for XYZ Consulting, a firm engaged by Complete Financial Management (CFM). CFM is a large Australian retail financial services company with a significant nationwide customer base to whom it offers funds management and related financial products. CFM now wishes to introduce a small range of life insurance risk products that it can sell to existing clients as well as to new customers.

CFM's Strategy Manager has suggested that his company should consider setting up a life company (CFM Life) registered under the Life Insurance Act 1995, to keep the profits from life insurance products in the CFM group. To this end, the Strategy Manager has asked XYZ for guidance on some of the relevant issues.

Draft a memo to CFM's Strategy Manager, addressing the following questions:

(a) What are the key requirements to be met in order for CFM to set up a life company registered under the Life Insurance Act 1995? (4 marks)

(b) What functions would CFM Life need to carry out as a registered life company? (3 marks)

(c) What are the main advantages and disadvantages to CFM with setting up its own life company, rather than using an established company to provide life products for CFM to 'badge' or sell under an agency agreement? (5 marks)

(d) What effects may this decision have on CFM's range of life products, and on the methods by which CFM acquires sales of these products? (3 marks)

(e) What would you recommend, with reasons, as the best course of action for CFM to take? (3 marks)

INSTITUTE OF ACTUARIES OF AUSTRALIA

COURSE 2A LIFE INSURANCE **OCT 2007 EXAMINATIONS**

QUESTION 1: SOLUTION **(18 Marks)**

Memo to: Strategy Manager, CFM
From: A. N. Actuary, XYZ
Date: 30 October 2007

Subject: Introduction of Life Insurance Products – Life Company issues

Further to our recent discussions, I am providing this memo to address the questions you have raised in your request for guidance on the introduction of life insurance products and the options available to your company.

I will address each of the questions on which you have asked XYZ for guidance as follows:

(a) Under the Life Insurance Act 1995, companies must show that they can meet their obligations to policy owners before APRA will register them as life companies. The key requirements to be met in order for CFM to set up a registered life company are that –

- **Application to APRA** is made in writing for registration of the life company, signed by the principal executive officer and a director of the company;
- **Capital requirements** are met – a life company must maintain capital outside the statutory fund of at least $10 million, which may be held as paid up share capital. The life company must maintain an excess of eligible assets over liabilities of at least $5 million;
- **Company's business plan** is acceptable to APRA – this is one of the two most important matters, the other being availability of capital as described above; and
- **Extensive requirements (under Schedule 1)** are provided –
  - ***information*** ("Particulars") set out in Part A of Schedule 1 to Life Insurance Regulations 1995 [including company data and structure, board and management structure, plans for new business, financing, distribution, investment, administration etc.], and
  - ***documents*** listed in Part B of Schedule 1 [including company constitution, financial statements, S.116 advices re premium rates and reinsurance arrangements, service agreements, agency agreements, reports and statements of related companies, and all marketing / policy documentation].

Marking guide:

Markers note: Formatting and language should be appropriate for the situation. As a matter of convention, 1 mark is determined on a standard basis to constitute CJ and is added into part (a), although the appropriate format and language should extend across the entire question. In assessing this, all parts should be in the required memo format to earn the relevant [1] mark.

Therefore, the marking scheme for part (a) is:

- **½ mark for application to APRA for registration under Life Act 1995;**
- **1 mark for adequate description of capital requirements;**
- **1 mark for reference to company's business plan as being of higher importance;**
- **½ mark for each item of *information* under legislative requirements (max. 1½);**
- **[½ mark for reference to "Information under Life Insurance Regulations", if no further detail provided];**
- **½ mark for each copy of *documents* under legislative requirements (max. 1½);**
- **[½ mark for reference to "Documentation under Life Insurance Regulations", if no further detail provided];**
- **and**
- **½ mark for any other reasonable and valid points made (max. 1½);**

to a maximum of 3 marks (KU). Plus 1 mark for formatting and language (CJ), for a total of 4 marks.

Examiners note: On above scheme there are up to ½ +1+1+ 1½ + 1½ = 5½ marks for KU section (out of maximum 3 marks available) – plenty of ways to get the marks. This also allows some 'marker discretion' to give less than the full (½ or 1 mark) allocation if such discrimination is required to differentiate students. Down to ¼ mark granularity is consistent with past practice in this area.

(b) The functions that CFM Life would have to perform as a registered life company are in the areas of –

- Product design / manufacture – must have S.116 advice given for each product;
- Distribution – agency, sales and marketing functions must be fully supported;
- Financing – raising and managing capital required to operate the life company and its business plans, products, sales and strategies etc;
- Legal documentation – policy documents, agency agreements, contracts etc;
- Policy issue – assessment of risk (i.e. underwriting), establishment of records etc;
- Accounting, premium billing and renewals, commission and reward systems etc;
- Regulatory compliance and reporting – significant overhead and support required;
- Reinsurance – an organisation of this scale (CFM Life) may need to reinsure risk;
- Investment of statutory fund assets – while less important given the proposed risk product range (requiring simpler investments), responsibility rests with the life company, including any outsourcing of management and/or custodial aspects;
- Claims processing – a key responsibility, given the proposed risk product range;
- Management – the important overarching functions of governance, strategy and direction, planning, operational management and review etc;
- The above functions can be summarised into divisions such as: Admin; Finance and Accounting; Actuarial; Investment; and Sales & Marketing – while these are the key divisions, the functions must still be described within those divisions;
- The "Admin division" entails New Business / Underwriting, Renewals, Claims, Policy Services etc – again, while these are the key departments, the functions must still be described within those departments. As above, responsibility rests with the life company, including any outsourcing of administrative aspects;
- Computer (IT) services are essential to procure and maintain appropriate systems. Again, responsibility rests with the life company, including any outsourcing of computing aspects.

<u>Marking guide</u>:

- **½ mark per function described in a manner relevant to CFM Life;**

to a maximum of 3 marks (KU).

(c) The main advantages and disadvantages are as set out below:

<u>Markers note</u>: The solution for this part of the question is set out in two sections, addressing the Advantages and the Disadvantages, each to count for 50% of the marks for this part of the question.

➢ ***<u>Advantages</u>***

- Direct control of product design – CFM Life would be able to specifically tailor its preferred product range to the marketing needs of its own customer base;
- Catering for its own distribution – CFM Life would be able to accommodate the requirements of its own agency, sales and marketing / distribution functions.
- CFM may also market to existing customers without privacy issues associated with involvement of a third party (established life company);
- More immediate company structure may reduce any delays in processing and/or reporting, remove need for third party contracts, and/or margins for third party services;
- Profits from the life insurance products will be kept within the CFM Group – but only if the challenges and costs arising from lack of experience in the market can be adequately surmounted.

<u>Markers note</u>: The suggestion that CFM Life would "keep the profits from life insurance products in the CFM group" is *<u>not</u> necessarily* a 'given', as advantageous. This will depend on financial and other aspects of the products that CFM wishes to sell; in particular, its lack of expertise in the areas of underwriting, claims management etc may diminish or completely negate the anticipated benefit associated with this suggestion. Marks should only be given for this point if it is appropriately qualified.

<u>Markers note</u>: The following are benefits but are not strictly advantages, more like non-disadvantages. They are however matters that could legitimately be included in a memo in the scenario described in the question.

- Finance support – CFM Life is very likely to benefit from strong capital support that its parent (CFM) can offer with raising and managing the capital required to operate a life company;
- Legal support – again, CFM Life is likely to receive legal support and expertise that its parent (CFM) may be able to offer;
- Accounting and reward systems may be able to 'integrate' across the CFM group;
- Investment functions may allow synergies, especially given the proposed risk product range (with its relatively simple investments);

- Management – strong support and synergy may be achieved with CFM in areas of governance, strategy, planning, operational management and review etc; and
- Computer (IT) services may also be able to 'integrate' across the CFM group.

Marking guide:

- **½ to 1 mark per Advantage to CFM that derives from setting up its own life company, depending on whether it is adequately described as applicable to CFM (1 mark) or just listed without relating it to CFM's situation (½ mark);**
- **¼ to ½ mark per Benefit (non-disadvantage) to CFM, as above;**

to a maximum of 2½ marks (SJ).

➢ ***Disadvantages***

- Very high level of onerous legislative, regulatory and compliance requirements – significant commitments of overhead and support required to register CFM Life as a life company and maintain on an ongoing basis. Total effort may be disproportionate to the intended benefits and strategy of CFM;
- Significant capital requirements for a non-core operation – even though CFM may have the capital, depending on the expected return on capital it may be a less efficient deployment of capital given the objectives and strategy of CFM and its relatively low-level interest in life insurance products;
- Lack of expertise in life insurance – high level of specialist knowledge required in areas of legal, underwriting, life insurance accounting, technical administration and claims management. This may lead to losses or lower returns on capital due to errors of judgment where inexperience results in poor risk management;
- May need greater use of specialist consultants, incurring higher costs;
- May constrain the scope of the product range that can be considered;
- May be at a disadvantage in negotiating reinsurance arrangements;
- Must undertake particular responsibility for training and licensing of sales force;
- Greater potential for distraction of CFM group, including Management, from its core area of expertise and success to date, and for conflict as different areas of the group compete for similar resources and priorities;
- Operational risk – significant risk in the area of operational management etc; and
- Specialist nature of computer (IT) systems requirements, limiting the potential for opportunities of intra-group synergies.
- Initial set-up costs may also be extensive.

Marking guide:

- **½ to 1 mark per disadvantage to CFM that derives from setting up its own life company, depending on whether it is adequately described as applicable to CFM (1 mark) or just listed without relating it to CFM's situation (½ mark);**

to a maximum of 2½ marks (SJ).

For a total of 5 marks available (SJ).

(d) The effects that CFM's decision (between setting up its own life company and the alternative of using a competitor's products that it 'badges' or sells under an agency agreement) may have on –

➢ ***The range of life products that CFM can offer:***

If CFM sets up its own life company –	If CFM badges or sells a competitor's –
• Products can be more tailored to CFM requirements;	• Products limited to what is available, or with limited variations;
• Initially need to keep products simple to design, sell, and administer;	• Can choose to keep products simple, or may opt for more advanced options;
• Limited by own technical expertise;	• Higher potential sophistication; and
• Initially prefer very small product range to focus on getting things right.	• May consider a wider product range to offer to CFM customers.

➢ ***Methods by which CFM acquires its sales:***

If CFM sets up its own life company –	If CFM badges or sells a competitor's –
• Distribution can accommodate more to CFM's existing sales channels;	• Obligation to comply with directives of originating product provider;
• Can market to existing CFM customers;	• May be prohibited under Privacy laws from marketing to existing CFM customers;
• May be hampered by limited product range;	• Wider product options enable greater scope for distribution channels;
• Higher compliance overheads; and	• Compliance borne by provider; and
• Lower potential structures of motivation and remuneration.	• CFM is able to focus more on sales rather than product development etc.

Marking guide:

- **½ mark per effect on the range of life products that CFM can offer, to a maximum of 1½ marks; plus**
- **½ mark per effect on methods by which CFM acquires its sales, to a maximum of 1½ marks;**

for a total of 3 marks available (CJ).

(e) Having considered –
- the requirements for setting up a registered life company [as set out in (a)];
- the responsibilities that CFM Life would have to undertake [as set out in (b)];
- the advantages and disadvantages of this option against the alternative of using another company to provide life products that CFM can offer [as set out in (c)]; and

- the implications of this decision for the range of life products that CFM can offer and for the methods by which CFM acquires sales of its proposed range of life insurance products [as set out in (d)];

I recommend that CFM ***defers*** the option of making application for registration of its own life insurance company, and pursues the immediate strategy of using another company to provide life products that CFM can offer. Note that on this approach, the option remains open at some future point for CFM to resume its interests in setting up its own registered life company if circumstances justify that decision further down the track.

The reasons I suggest that this is the best course of action for CFM to take are that –

- the progression to setting up its own registered life company (if that eventuates) would be more logical and manageable as experience is gained in the relevant areas of the business that are new to CFM;
- the risk profile and exposure of capital is initially much lower;
- the strategy is easier to implement immediately, while not excluding the option of pressing on at a later stage to the full steps of its own life company;
- the advantages of "keeping all the profits" are outweighed by the relative risks of loss due to inexperience, as well as the prospects for quite attractive profits from selling the life products through another company (likely to be a competitive field to explore); and
- the effects on CFM's proposed product range and marketing strategy are probably less significant given the relative simplicity of the products that it is intending to introduce anyway.

Marking guide:

- **1 mark for reasonable recommendation (NOTE that, while not impossible to justify the proposal to set up a life company, this is a less preferred option; in that case, the "reasons" would need to be good ones. Similarly, it is possible to recommend that the proposal be *rejected outright*; again, that is less than optimally appropriate as a longer term option.);**
- **½ mark per reason (so that just one reason is not enough; and they should be well presented to get the ½ mark each);**
- **½ mark for making the connection that logically follows from parts (a) to (d) and this closing part (as set out in the intro of part (e) above); and**
- **½ mark for any other reasonable and valid points made;**

to a maximum of 3 marks (CJ).

END OF QUESTION 1

QUESTION 2 **(16 Marks)**
Analysis

Component	Aim	KU	SJ	CJ	Total
Part a)	5, 8, 9	4			4
Part b)	2, 5, 7, 9		3	3	6
Part c)	2, 4, 5, 7		3		3
Part d)	2, 5, 9			3	3
Total	**2, 4, 5, 7, 8, 9**	4	6	6	16

Question

You are an actuary at Aspect Life Insurance (ALI), a medium-sized life insurance company whose product range includes a significant and growing block of individual Disability Income (DI) business. The most recent valuation was for the year ended 30 June 2007. The results of that valuation show a morbidity loss of $950,000 and you have been asked to recommend a strategy for ALI to address this situation.

Morbidity results obtained from the valuations of policy liabilities for this business over the past three years are as follows (where all amounts are shown as $'000):

Valuation item	Year ended 30 June 2005	Year ended 30 June 2006	Year ended 30 June 2007
Actual morbidity	**9,730**	**13,690**	**18,280**
Expected morbidity	**11,070**	**13,950**	**17,330**
Morbidity profit	**1,340**	**260**	**- 950**

(a) What further analysis or investigations could be made to provide ALI with a better understanding of the morbidity results? (4 marks)

(b) Once further investigations have been made, it appears a significant portion of morbidity losses arose from business sold via a single distribution group that generates a major share of ALI's sales of new business for its DI products. Outline possible options to mitigate the insurance risk for DI business sold via this distribution group and identify any issues that may limit these options. (6 marks)

(c) Apart from morbidity, what other aspects of ALI or its experience might possibly be harmed by its association with the distribution group identified in (b)? (3 marks)

(d) One option that has been suggested as a strategy to address this situation is for ALI to reinsure a high proportion of future new business for DI products sold via the distribution group identified in (b). Discuss this suggestion. (3 marks)

QUESTION 2: SOLUTION (16 Marks)

(a) The valuation morbidity results are for the whole block of DI business and show the results for actual versus expected 'in aggregate'. To gain a better understanding of what is driving the apparent deterioration, the further analysis and/or investigations that are possible would include –

- Breaking down the "actual" and "expected" measures of morbidity into their technical components relating to Claims incidence (i.e. the inception of a claim) and Claims continuance (i.e. the termination experience of claims once they are in progress).
- Further analysis of Claims termination experience would be possible by duration of claim, which is an important determinant of claims management in relation to DI business.
- Analysis of the Claims incidence experience by policy duration in force can also provide insight into the degree of selection compared to that assumed. It could also point to the presence of fraudulent claims.
- As the results are 'annual' figures, some investigation may be made into whether there are any patterns of a seasonal or cyclical nature within the annual results, e.g. look at particularly 'heavy' months or quarters, to see if there is any unusual pattern of payments underlying the results.
- Looking for any large claims that may be affecting the claims experience, to see if they are in any way exceptional. While there may be no specific remedy that can be applied, this will at least assist in understanding possible causes for the results.
- For a company of this type, investigations of its 'own experience' are unlikely to be limited just to the valuation results alone – there will be specifically targeted experience reviews. Therefore the precaution should be taken of comparing the valuation results with specific investigations of the morbidity experience, to ensure that there is consistency between 'the signals' that are arising out of different views across the same business.
- Sub-dividing the total aggregates of DI experience into significant components according to the underlying risk factors in the business would be valuable, e.g. –
    - By various rating factors, such as age, sex, occupation class, smoker status etc;
    - By different product lines, such as "Prestige product", "Basic product" etc;
    - By distribution channels (given that this arises in part (b), it is a 'give-away' point to include in part (a) – but it is essentially valid, and should get a ½ mark); and
    - By size of business, particularly where that is a factor impacting on premium rating and/or reinsurance terms – while we are not told whether the figures in the question are Gross or Net of reinsurance, the natural interpretation would be that they are Net results.
- The assistance of a DI Claims service provider and/or the relevant reinsurer may be of direct value, given their wider experience of the market and the industry.

<u>Marking guide</u>:

- **1 mark for each of (the 'big arrow' points) –**
  - **Break down by *incidence* and *continuance/termination*;**
  - **Termination *by duration*;**
  - **Incidence *by policy duration*;**
  - **Seasonal / monthly or quarterly elements;**
  - **Compare valuation with specific experience investigations;**
  - **Break down by significant components of the business;**
  - **Obtaining assistance from a specialist DI Claims service or reinsurer; and**
  - **Any other reasonable and valid points made.**

- **½ mark for sub-dividing into each of –** **(max. 1 *further* mark here)**
  - **Various rating factors;**
  - **Product lines;**
  - **Distribution channels;**
  - **Size of business;**
  - **Reinsurance category; and**
  - **Any other reasonable and valid sub-divisions suggested.**

to a maximum of 4 marks (KU).

(b) The question asks for consideration of two matters with respect to this result, as follows –

➢ ***Possible options to deal with this situation (which are directed towards reducing the costs of business sourced via the relevant distribution group):***

- Increase the premium rates for business sold via the relevant distribution group;
- Decrease the commission terms of the relevant distribution group without changing premium rates;
- Increase the commission terms, but make them directly dependent on the experience arising from business sold via the relevant distribution group;
- Apply tighter control over the underwriting standards applied to business sold via the relevant distribution group;
- Apply tighter control over the claims management standards applied to business sold via the relevant distribution group;
- Re-negotiate the terms of any reinsurance applicable to business sold via the relevant distribution group (given that this arises in part (d), it is a 'give-away' point to include in part (b) – but it is possibly valid, and should get a mark);
- Engage in focused review, and if required, re-training of practices prevailing in the relevant distribution group; and/or
- Terminate the agency agreements with the relevant distribution group.

➢ ***Any issues that may limit these options:***

- Increase the premium rates for business sold via the relevant distribution group – may not be fair on the policyholders, or may be highly impractical or even illegal;

- Decrease the commission terms of the relevant distribution group – does not directly address the issue, which is about morbidity, not 'total costs';
- Make the commission terms directly dependent on the experience arising from business sold via the relevant distribution group – in practical terms, this may be of some value, but it may lead to 'arguments' between ALI and the agent group over who is responsible for 'the experience';
- Tighter control over the underwriting - may not be fair on policyholders, or may be difficult to implement. In practical terms, this may be the preferred option, but it may lead to 'arguments' between ALI and the agent group over what is acceptable in terms of business standards and practices;
- Tighter control over the claims management - may be difficult to implement. In practical terms, this would probably be at least part of the preferred option, but it may lead to 'arguments' between ALI and the agent group over what may be perceived as 'intrusive' or discriminatory business standards and practices;
- Re-negotiate terms of any reinsurance applicable to business sold via the relevant distribution group (while allowed as a 'give-away' point above, it should ***not*** be extended in this section – otherwise there is risk of 'double-counting' with (d));
- Focused review, and if required, re-training of practices prevailing in the relevant distribution group. In practical terms, this would probably be at least part of the preferred option, but it may lead to 'arguments' between ALI and the agent group over what may be perceived as 'intrusive' business practices; and/or
- Terminate the agency agreements with the relevant distribution group – while this may be a 'last resort', it cannot be ruled out. However, given that this group is apparently generating "a major share" of ALI's sales of new business for DI, this step may result in another problem due to loss of market share, scale of operations, and possibly reputation damage.

Marking guide:

- **Up to 1 mark for each valid point under "possible options", depending on how well the point is made;**

to a maximum of 3 marks (SJ); plus

- **Up to 1 mark for each valid point under "any issues", depending on how well the point is made;**

to a maximum of 3 marks (CJ);

for a total of 6 marks available.

(c) Here the question asks for consideration of aspects other than morbidity. The other aspects of ALI or its experience that might possibly be harmed by its association with this distribution group could possibly extend to the following:

➢ Lapse experience:

- If the poor morbidity experience relating to this distribution group arises from undesirable business standards and practices within the group, that may also evidence itself in sales of poor quality business which would be reflected in worse than average lapse experience; and/or
- If the business is being sold on a predication of claims expectations that are unrealistically elevated, then policyholders may lapse when they fail to meet the expected claims entitlements, again leading to inflated lapse experience.

➢ Expense experience:

- Similarly to above, if the poor morbidity experience relating to this distribution group arises from undesirable business standards and practices within the group, that may also evidence itself in higher levels of complaints or administrative issues which would be reflected in worse than average expense experience.
- There may be grounds for associating higher costs of new business acquisition with a group of this sort, depending on the underlying reasons for poor morbidity results (as suggested above). This may include higher underwriting costs (due to worse than average risks being introduced, and possibly rejected during the course of underwriting), higher claims management costs (for similar reasons) etc.

➢ Broader 'business' experience:

- Having "a major share" of sales of new business for DI generated by a single distribution group is a situation of obviously concentrated risks – operational, reputational, and strategic. This may discourage associations with other groups that are unwilling to work beside such a group, resulting in further concentration and hence increased risk.
- To a large degree, this sort of situation may become 'self-perpetuating'.
- There may also emerge a degree of compliance, legal, and regulatory risks.
- Relationship with their reinsurer may be damaged

Marking guide:

- **Up to 1 mark for each of the above points, reasonably explained to confirm its relevance and the student's understanding; plus**
- **Up to 1 mark for any other reasonable and valid points made;**

to a maximum of 3 marks (SJ).

(d) The question asks for discussion of the suggestion. Points of such discussion should include:

➢ An 'in principle' response:

- As the primary 'problem' is apparently related to morbidity experience arising from a major distribution group, this amounts to an issue of "insurance risk".

One of the means available to ALI for management of its insurance risk is access to reinsurance, and in principle that response should be acknowledged as valid.

- Having identified "insurance risk" as the area of concern, there are several options that ALI could consider, and reinsurance is only one of these – the others should also be acknowledged.

➢ Some 'essentially practical' responses:

- Any reinsurer will want to offer terms that it would find profitable for itself. This means that ALI can't just reinsure loss-making business and expect to turn its losses into profits or to isolate itself from the effects of the underlying business.
- The reinsurer would expect to 'price into its terms' the real experience of any business it agrees to reinsure, so that the premiums that ALI can most likely expect to pay for such reinsurance would still represent 'loss-making' terms on the net results after reinsurance premiums and claims are taken into account.
- There may be a risk of damaging the relationship between ALI and its reinsurer.
- It still fails to come to terms with the underlying business reasons for the 'poor morbidity results'.
- It may be very difficult and largely impractical to arrange such reinsurance terms, given the artificial and selective nature of the basis on which it is suggested.

While a conclusion is not specifically required by the wording of the question, the discussion should tend to discount, rather than to talk up, the prospects for this suggestion as a potential remedy for the problem that ALI is confronted with.

Marking guide:

- **Up to 1 mark for each comment, as above; plus**
- **Up to 1 mark for any other reasonable and valid points made;**

to a maximum of 3 marks (CJ)

QUESTION 3 **(16 Marks)**

Analysis

Component	Aim	KU	SJ	CJ	Total
Part a)	1, 5, 8	2	2		4
Part b)	2, 4, 8		3		3
Part c)	6, 8, 9	2	2		4
Part d) (i)	4, 6, 7, 8			3	3
Part d) (ii)				2	2
Total	**1, 2, 4, 5, 6, 7, 8, 9**	4	7	5	16

Question

Ravel Financial Services (RFS) is a publicly listed Australian life insurance company that specialises in writing annuity business. The product range consists of allocated annuity and immediate annuity products, including lifetime and term certain annuities.

One of RFS's lifetime annuity products is designed for 'impaired lives' where a lump sum awarded as compensation for personal injury is applied to purchase a lifetime annuity on terms that reflect significantly reduced life expectancy for the annuitant.

At the company's 30 June 2007 year end, total assets under management were around \$1.2 billion for allocated annuities and \$750 million for immediate annuities.

The benchmark asset allocation for the lifetime annuity portfolio consists of 50% in high-yield fixed interest (for terms of 5-10 years), 35% in equities (with growth focus) and 15% in property (direct and via unit trusts). At 30 June 2007 the actual asset allocation for this portfolio was very close to these benchmark targets.

Mortality results using 'release of reserves on death of annuitant' were extracted from each year's analysis of profits done as part of the valuations of lifetime annuity business, and are set out as follows (where all amounts are shown as \$A'000):

Year	**'Impaired lives' business**			**Other lifetime annuities**		
	Actual release	**Expected release**	**Mortality profit**	**Actual release**	**Expected release**	**Mortality profit**
2004-05	**328**	**135**	**193**	**20,626**	**21,378**	**- 752**
2005-06	**791**	**428**	**363**	**22,595**	**23,449**	**- 854**
2006-07	**1,485**	**913**	**572**	**24,805**	**25,726**	**- 921**

(a) **Describe the main features of the company's lifetime annuity mortality results for the period 2004-07 and outline possible explanations for these features.** **(4 marks)**

(b) **Identify and discuss any issues that the mortality results may raise for risk management within RFS.** **(3 marks)**

(c) What are the basic financial characteristics of a lifetime annuity portfolio? How should these be taken into account when setting the benchmark asset allocation? (4 marks)

(d) Apart from 'longevity risk', identify and explain the key risks that RFS may face, including possible mitigations for those risks, with respect to:
- **its lifetime annuity portfolio; and**
- **its business more generally. (5 marks)**

QUESTION 3: SOLUTION (16 Marks)

(a) <u>Note</u>: The solution set out below is extensive and detailed to provide additional background and greater clarity of each point. Students would not be expected to provide the same level of detail in order to obtain the ½ mark for each point.

<u>The main features</u> of the company's lifetime annuity mortality results for the period 2004-07 are –

➢ Growing levels of 'in force' business – as reflected in expected release:

- While there are several factors that impact on the level of "expected release of reserves" (ERR), the major and dominant factor is the level of business in force.
- Taking ERR as a ***<u>proxy</u>*** for in force business, impaired lives business has grown rapidly – by more than threefold from 2004-05 to 2005-06 (growth rate of 217%), and by more than twofold from 2005-06 to 2006-07 (growth rate of 113%). In total, it grew by an almost sevenfold increase from 2004-05 to 2006-07, albeit from a very low base.
- Continuing with ERR as a ***<u>proxy</u>*** for in force business, other lifetime annuities has grown moderately – by about (a growth rate of) 10% in each of these two years (against the previous year's figures available).
- The combined total of lifetime annuity business has grown by about 11-12% in each of these two years. This is still a moderate overall growth rate.
- The proportion of total of lifetime annuity business accounted for by impaired lives business has grown from 0.6% in 2004-05 to 3.4% in 2006-07. This remains a small proportion, both in relative as well as absolute terms. The thing that is most remarkable is its growth, rather than its scale in the overall sense.

➢ Highly 'profitable' impaired lives business – as reflected in mortality profits:

- Mortality profit [ARR – ERR] as a percentage of ERR, ranging from 143% in 2004-05, to 85% in 2005-06, and to 63% in 2006-07. This is very large, at least in relative terms.
- As the absolute amounts are not large, there is a high degree of 'lack of statistical significance' to these results. One or two events could easily sway the entire results for such a small portfolio in any year.
- Even so, there is a general and proportionately large trend over the whole period.

➢ Moderately 'unprofitable' other lifetime annuity business:

- Mortality profit [ARR – ERR] is negative and, as a percentage of ERR, falls generally within the range of -3% to -4% in each of the years in the period. This is small in relative terms, but results in real losses that would represent a significant proportion of the profit results overall.
- As absolute amounts of ARR and ERR are fairly large, there is a higher degree of ‘statistical significance’ to these results. The credibility would probably be quite strong.
- Again, there is a general and consistent trend over the whole period.

➢ Modest and falling (i.e. improving) ‘unprofitability’ of lifetime annuity business, overall:

- Mortality profit from impaired lives business offsets about 26% of the loss from other lifetime annuities in 2004-05, and this rises to 43% and 62% in the next two years, respectively.
- Given the relative size of the respective bases for these two lines of business, that would seem a highly unreliable, and in fact unsustainable, trend.

Possible explanations for these features are –

➢ Impaired lives business is a fairly new development (and possibly ‘experimental’ product line), with little to base its assumptions on:

- The low base in 2004-05 and high growth rates indicate a new line of business.
- The relatively small absolute size of the portfolio reinforces this conclusion.
- Possibility of greater volatility of experience if a single large annuity goes off the books.
- The high growth rate would seem to reflect a new market opportunity that has emerged, e.g. due to a change in legal, regulatory or tax environmental factors.

➢ The absence of a reliable basis for assumptions on impaired lives mortality may have been reflected in highly conservative pricing assumptions:

- The lower levels of ERR for impaired lives compared to ARR would indicate that the mortality was assumed to be much better/lower than has applied in reality. This may be due to starting with ‘standard lifetime annuitant mortality assumptions’ as a base from which to derive an estimate of the expected mortality for impaired lives.
- Given the relative uncertainty, a more conservative assumption would be reasonable as a starting point.
- Actual mortality has been much worse/higher than expected, resulting in much larger ARR compared to ERR.

➢ Standard lifetime annuity business is a well-established, mature and more highly competitive market sector:

- The larger base throughout the period indicates a well established business line.
- The fact that it continues to grow indicates that it is being issued on competitive terms, in relation to the market sector for lifetime annuities.

- For some time, annuitant mortality has been improving faster than generally allowed for in competitive pricing models.
- This results in mortality losses, when the levels of ARR (reflecting lighter actual annuitant mortality) fall short of the "expected" (or assumed – in pricing terms) levels of ERR.

Marking guide:

- **1 mark for each "feature of the results" (the 'big arrow' points), depending on how well the feature is described;**

to a maximum of 2 marks (KU); plus

- **1 mark for each "possible explanation" (the 'big arrow' points), depending on how well it is explained;**

to a maximum of 2 marks (SJ);

for a total of 4 marks available. There is a maximum of 1 mark per each major ('big arrow') section, so that full marks are not awarded simply by getting all the points in just one section.

(b) Issues that the mortality results may raise for risk management within RFS are as follows –

➢ ***Mortality assumptions for "Other lifetime annuities" may be too heavy and hence out of date:***

- This is potentially an issue for the pricing basis – "risk management", as it relates to the element of insurance risk;
- As the company is also subject to Australian actuarial standards, it should be basing its valuations on 'best estimate assumptions', so there is a chance that those assumptions are also out of date and in need of adjustment – this is an aspect of "risk management", as it relates to the element of regulatory and compliance risk;
- To possibly make matters slightly worse, there is a chance that each year's assumptions have been updated for the previous year results (showing loss), which would mean that lighter mortality has been adopted and the pattern of 'mortality improvement' has continued to build up in a way that compounds the losses. While that is less likely, it would need to be checked – has the basis for "ERR" been revised during the period?;
- If the above risks are confirmed as applicable in practical terms, then there may be flow-on implications to other areas of measurement within the risk framework for RFS – the appropriate 'signals' may not be emerging in several elements of the valuation and/or the experience analysis framework; and
- An assumption change can have further implications. Required capital is likely to increase, leading to the holding of further assets in the lifetime annuity portfolio. If the change requires loss recognition, then even further assets may be required.

➢ ***Mortality assumptions in "Impaired lives business" appear to be too light:***

- While this may generate 'profits', it may indicate that the pricing basis is too conservative; and
- There is a real risk of reputational damage if RFS was to be put under scrutiny about its pricing of impaired life annuity terms – these may not be a large part of its total portfolio, but the risk of criticism about "exploiting sub-standard lives to its own profitable advantage" is a disproportionate risk of bad media / PR, which a publicly listed company would prefer to meticulously avoid.

Marking guide:

- **½ to 1 mark for each issue raised (as above), depending on quality of discussion; plus**
- **½ to 1 mark for any other reasonable and valid points made, again depending on quality of discussion;**

to a maximum of 3 marks (SJ).

(c) ***The basic characteristics of a lifetime annuity portfolio*** that are relevant to the asset allocation are –

- Large single investment (purchase price) at outset – once this initial single premium is received and invested, policy liabilities must be covered by the assets alone, as there will be no further premium receipts;

- Long term of liabilities – annuity benefits may continue to be paid for very long terms into the future, depending on longevity of annuitants;

- Guaranteed benefits – annuity benefits are of fixed or contractually determined guaranteed amounts, with little or no flexibility to be adjusted. Sometimes there are indexation conditions that tend to 'lengthen' the liability duration even further;

- Regular benefit outflows – while the term of liabilities is long, the requirement to meet benefit payments on a regular basis is very 'predictable';

- Competitive marketplace – purchase price needs to be invested to achieve a sufficiently high return and/or growth; and

- Significant capital requirements – in Australian context, capital requirements for annuity portfolios are significant in terms of capital adequacy standards.

The way that this should be taken into account when setting the benchmark asset allocation for a lifetime annuity portfolio is –

- Assets that provide a high degree of capital security – as initial single premium is invested to provide for all future policy liabilities, the degree of risk exposure to loss of capital should be contained within acceptable limits;

- Assets that provide a long term profile – asset / liability matching by duration is required as a means of managing the interest rate risk, in terms of the impact of a rise or fall in interest rates on the relative values of the assets and the liabilities;

- Assets that provide a steady stream of income that accommodates the liquidity requirements of the portfolio, as well as matching levels of asset income closely to the levels of liability outgo;

- Assets that provide a sufficiently high rate of return and/or growth to meet the competitive forces in the marketplace and support the pricing requirements; and

- Assets that entail an acceptable level of capital requirements – this may vary from one company to another, depending on how much capital it is prepared to put up for the support of the annuity portfolio.

Marking guide:

- **½ to 1 mark for each of the basic characteristics, depending on whether each one is just stated without any further comment (½ mark) or explained in terms of its implications for the asset allocation (1 mark);**

to a maximum of 2 marks (KU); plus

- **½ to 1 mark for each of the applications to asset allocation, depending on whether each one is just stated (½ mark) or explained adequately (1 mark);**

to a maximum of 2 marks (SJ);

for a total of 4 marks available.

(d) Note: The solutions set out below are very detailed, to provide additional background and greater clarity. Students would not be expected to provide the same level of detail in order to obtain the allotted marks.

Apart from 'longevity risk', the key risks that RFS may face, including possible mitigations for those risks, with respect to:

i. ***its lifetime annuity portfolio*** are as follows:

- Economic risk – containment of expenses, and particularly inflation of its costs, is critical when the company has fixed or contractually determined guaranteed policy liabilities that must be met entirely from existing assets, without further income apart from what it earns on its assets;

Possible mitigations:
- Pursue real productivity gains, e.g. from enhanced computer systems;
- Diversify product range to broaden business base for expenses; and/or
- Adjust asset allocation marginally, so that some gains can be derived from investments that move in line with economic climate, e.g. growth shares that respond in line with inflation.

- Investment risk – clearly the implications of asset allocations as set out in part (c) mean that asset/liability matching is important, and any significant departure from a closely matched asset allocation represents the potential for investment risk, particularly as regards movements in market interest rates and/or asset values;

  Possible mitigations:
  - Monitor asset allocation closely, to maintain asset/liability matching;
  - Portfolio Insurance methods can be implemented when appropriate; and
  - Diversify product range to reduce proportionate significance of investment risk – this includes 'within the annuity business' (e.g. term certain and unit linked entail lower investment risk) as well as beyond it.

- Operational risk – when benefits are administered by means of automated system processes, there inevitably arises a risk of process errors. In a lifetime annuity portfolio, one of the key risks relates to the establishment of ongoing entitlement (i.e. proof of survivorship as a precursor to receipt of benefit). Other operational risk dimensions arise from 'indexation', frequency of benefit payments by means of instalment, reversions of joint life terms etc;

  Possible mitigations:
  - Closely monitor administrative processes, including regular and focused process controls such as audits, reconciliations etc;
  - Utilise payment methods that are more likely to detect cessation of entitlement (e.g. payment into personal bank account, which is 'frozen' when person dies); and
  - Maintenance of well-disciplined risk management framework, e.g. register of key risks, analysis of likelihood and impact, investigation of all losses and "near misses" on a timely and focused basis.

- Reputational risk – as already referred to in connection with impaired lives business, the issue of annuities on terms that are later found to be unduly harsh or disadvantageous to lives of sub-standard expectation may be a serious risk issue.

  Possible mitigations:
  - Maintain high degree of integrity over business standards and practices;
  - Obtain independent professional advice and review of all key business elements; and
  - Dynamic and responsive governance along with framework of accountability and transparency within the company.

ii. ***<u>its business more generally</u>*** are as follows:

- A number of the above risks also arise for the RFS business more generally, due to its concentration in annuity business (including allocated annuity [62% of its total business] and term certain, as well as lifetime). These would include economic [expenses/inflation], investment [to the extent that liabilities are capital guaranteed, rather than unit linked], operational risk, and so on;

  Possible mitigations:
  - As listed above, for each one; and
  - Diversify product range to broaden business base generally.

- A particularly significant area of risk arises under the "strategic risk" heading, due to the concentration of RFS business in the annuity market. If changes in the environment (e.g. superannuation system, tax rules, regulatory structure etc) lead to loss of market support in this sector, RFS is exposed to the dislocation of its main product focus and source of profitability.

  Possible mitigations:
  - Adapt policy terms and conditions to create innovative responses to changing environmental situations; and/or
  - Diversify product range to broaden business base generally.

Marking guide:

- **½ to 1 mark for each of the key risks, depending on whether each one is just stated without any further comment (½ mark) or explained in terms of its significance to RFS (1 mark); plus**
- **½ mark for each mitigation given;**

to a maximum of 3 marks in part (d) i, and a maximum of 2 marks in part (d) ii;

for a total of 5 marks available (CJ).

QUESTION 4 **(18 Marks)**

Analysis

Component	Aim	KU	SJ	CJ	Total
Part a)	1, 2, 5, 12	2			2
Part b)	1, 2, 5, 12		4		4
Part c)	9, 10, 12		2		2
Part d)	1, 5, 12			6	6
Part e)	4, 9, 12			4	4
Total	**1, 2, 4, 5, 9, 10, 12**	2	6	10	18

Question

You are the Risk Products Actuary at Bastion Assurance Ltd (BAL), a medium-sized Australian life insurance company. BAL's newly appointed Marketing Manager has suggested that there is an opportunity to increase sales of yearly renewable term insurance by adapting the current BAL product to a market segment described as "Class A professionals in small business practices". In his discussion paper he has included suggestions that the current YRT rates could be adjusted for:-

- **10% lower mortality, as these are 'groups of lives' with better risk profiles due to their professional and socio-economic classes, i.e. a more 'select' pool of lives;**
- **10% lower expenses, due to simplified administration achieved by having several lives covered under a single policy relating to their common business interests;**
- **improved persistency (resulting in lower lapse rates), as the basis for insurance is directly connected with small business companies and partnerships; and**
- **larger average policy sizes, for similar reasons.**

The Marketing Manager is therefore suggesting that the current YRT rates could be reduced by the order of 12-15% for these factors. He has also made comments in his discussion paper that are drawn from a number of group life concepts. These include that:-

- **Automatic Acceptance Limits could be considered in lieu of full underwriting;**
- **No policy fees or frequency loadings would be required in the premiums; and**
- **Potential exists for some participation in the Group Life profit share pool.**

The Chief Executive Officer has asked you to review and respond to the Marketing Manager's suggestions.

(a) What further information would you require for this review? (2 marks)

(b) Assuming you have now received the information mentioned in (a), outline how you would proceed with this review. (4 marks)

(c) A 'benchmark' YRT premium rate for the BAL product is currently \$1.20 per \$1,000 sum insured, comprising –

- **\$0.60 for the net premium;**
- **\$0.15 as loading for recovery of initial commission;**
- **\$0.12 for renewal commission;**
- **\$0.09 for recovery of initial expenses;**
- **\$0.12 for renewal expenses (other than those covered by the policy fee); and**
- **\$0.12 for profit.**

Calculate
- **the revised benchmark premium rate; and**
- **the proportional reduction from the current rate**

based on incorporating the Marketing Manager's suggestions.

<u>**NOTE**</u>**: Only the Marketing Manager's quantified suggestions need to be allowed for. Include definitions used in your formula and any assumptions you have made, and show all workings. (2 marks)**

(d) Discuss each of the Marketing Manager's suggestions and comments, and provide your assessment of their likely validity or otherwise. (6 marks)

(e) List and explain any other issues with this proposal. (4 marks)

QUESTION 4: SOLUTION (18 Marks)

(a) The process for product development and/or review is usually set out in a number of 'stages' that proceed logically through the project cycle. These do not always present themselves in such an orderly way in practice, as is apparent in the scenario for this question. As the Marketing Manager is 'somewhere around stage 3 or 4', we need to ask for the preceding information.

<u>**Note**</u>**: While the student's answer need not be set out in the same way as the solutions below, the format has been taken from the relevant section of the course. Part of this question is to see how students relate a practical scenario to the relevant procedure expected, given that it has apparently not been formally established in this instance.**

➢ ***1 – "Idea":***

- What analysis has gone into consideration of -
  - The environment;
  - Marketing opportunities;
  - Economic factors;
  - Competition in the industry;
  - Technology and/or admin-systems requirements within BAL;
  - Overseas experience; and/or
  - Financial factors?

- We should expect to see some analysis, at least in the form of a draft assessment of the above elements, and would ask the Marketing Manager to provide information along these lines.

➢ ***2 – "Screening":***

- What analysis has gone into consideration of -
  - Compatibility with BAL's existing product range;
  - Consistency with BAL's corporate objectives;
  - The target market;
  - Implications of this suggestion for integration with current admin-systems within BAL;
  - The marketing strategy; and
  - Alternative options available?

- Again, we should expect to see some analysis, at least in the form of a draft assessment of the above elements, and would ask the Marketing Manager to provide information along these lines.

➢ ***3 – "Proposal":***

- What are the expectations for this suggestion, in terms of -
  - Development costs/budget for the product;
  - The process for taking it forward, if supported (e.g. Form a team? Who will be in the team? Who are the stakeholders and the owners of various streams?)
  - Projected levels of sales, with detailed supporting basis for those figures;
  - Impact on existing products, distribution channels etc; and
  - The basis for experience factors that have been 'suggested' (what sources)?

- Clearly, we should expect to understand the "process" framework, and would ask the Marketing Manager to share his views in these areas.

Marking guide:

- **¼ to ½ mark for each element requested, depending on whether it is a major (big arrow PLUS dot point) element (½ mark) or one of the sub-components (dash points) (¼ mark);**
- **¼ to ½ mark for any other reasonable and valid points made, using similar criteria to above (½ mark, major; ¼ mark otherwise);**

to a maximum of 2 marks (KU).

Students' answers may ignore the aspects of process set out in points 1-3 above and may concentrate instead on actuarial information (projected profits, capital requirements, sensitivities etc). In the scenario for this question the implication is that the actuary has not yet been consulted. It is therefore the items that relate to steps 1-3 that ought to be included for consideration. Full marks should not be obtained if those steps are ignored or overlooked.

(b) Having received at least a draft of the analysis on which the Marketing Manager has based his suggestions, the relevant review process would be as follows:

➢ ***1 – Review the "Idea":***

- Focus particularly on -
  - Marketing initiatives – are there any comparable developments that BAL has done in the past that can be used as a reference for assessment of the likely prospects for the success of this initiative? (Learning from past experience is important)
  - Competition in the industry – are there any similar products that should be considered as possible indicators of the expected differentials that the MM has included in his discussion paper?
  - Assess the likely experience – is the degree of 'benefit' that the MM has listed within a reasonable range? May need to canvass wider experience within the reinsurance providers or other professional consultants (may also consider any overseas experience).

- Do we agree with and endorse the analysis on which the Marketing Manager has based these suggestions, and can we support it in discussions with the CEO?

➢ ***2 – Review the "Screening":***

- Focus particularly on -
  - Forming an assessment (at least in qualitative terms) of the likely impacts on other elements of BAL's existing product range;
  - Make an assessment of the suggestions against BAL's corporate objectives, to see if there is an essential degree of compatibility and consistency;
  - Assessment of the potential implications of this suggestion for integration with current admin-systems within BAL – how well would it work, or are there likely to be insurmountable issues?
  - Is there a convincing and compelling marketing strategy, including the likely impacts on other elements of BAL's existing product range and on the current distribution channels etc?
  - Have any reasonable alternative options been identified and prematurely discarded or even overlooked (excluded)?

- Again, do we agree with the analysis on which the Marketing Manager has based these suggestions, and can we support it in discussions with the CEO?

➢ ***3 – Review the "Proposal":***

- Focus particularly on -
  - Forming an assessment (at least in qualitative terms) of the likely levels of sales compared with those projected, and in the process apply close scrutiny to the detailed supporting basis for those figures;
  - Make an assessment of the suggestions in terms of likely impact on BAL's existing products, distribution channels etc – this is an essential aspect of the

review which could easily be overlooked, to the significant detriment of BAL's overall sales and profitability; and

- The basis for experience factors that have been 'suggested' (what sources)? – a very close scrutiny must be applied to the detailed supporting basis for those figures, as that is 'the essence' of this proposal.

- As above, the essential question is: "Do we agree with the analysis on which the Marketing Manager has based these suggestions, and can we support it in discussions with the CEO?"

Marking guide:

- **½ to 1 mark for each aspect of the review, depending on whether it is a major (big arrow) aspect (1 mark) or one of the sub-components (dot points) (½ mark);**
- **½ to 1 mark for any other reasonable and valid points made, using similar criteria to above (1 mark, major; ½ mark otherwise);**

to a maximum of 4 marks (SJ).

Students' answers may ignore the aspects of process set out in points 1-3 above and concentrate instead on items of actuarial information. As for part (a), the items that relate to steps 1-3 ought to be included for consideration, so full marks should not be obtained if those steps are ignored or overlooked.

(c) The adapted premium rate for this benchmark premium rate based on the Marketing Manager's quantified suggestions is calculated as:

1. Apart from "commission and profit components" –
- $0.60 for the net premium x 0.9 for 10% lower mortality = $0.54;
- $0.09 for recovery of initial expenses x 0.9 for 10% lower expenses = $0.081; and
- $0.12 for renewal expenses (other than those covered by the policy fee) x 0.9 for 10% lower expenses = $0.108;

giving a total of $0.729 instead of $0.81 for these elements.

2. If commission and profit were regarded as driven by 'amount per unit of sum insured' (albeit, achieved by means of pro-rata to premiums), then those components would be 're-expressed' as slightly higher percentages required to generate the same amounts per unit. On this basis, the adapted premium rate would include the same amounts as the benchmark rate, and the total adapted rate would be $0.729 + $0.15 + $0.12 + $0.12 = **$1.119**, i.e. reduced by a proportional reduction of $0.081 / $1.20, or ***6.75% reduction***, well short of 10% reduction.

3. If only profit were regarded as driven by 'amount per unit of sum insured' and commission regarded as driven directly by 'pro-rata to premiums', the profit component would be 're-expressed' as a slightly higher percentage required to generate the same amount per unit. The adapted premium rate would include the same amount for profit as the benchmark rate, while the components for commission would be adjusted pro-rata to the total adapted rate. Working back, the commission elements that are currently 12.5%

and 10% respectively (of $1.20 as the benchmark total rate) would be allowed for as 12.5% and 10% respectively of [$0.729 + $0.12] / (1 – 0.225) or $0.849 / 0.775 = **$1.0955**, i.e. reduced by a proportional reduction of $0.1045 / $1.20, or ***8.7% reduction***, still somewhat short of a 10% reduction.

4. If and only if commission and profit were regarded as driven by 'pro-rata to premiums', the adapted premium rate would include lower amounts as the components for commission and profit, adjusted pro-rata to the total adapted rate. The commission and profit elements that are currently 12.5%, 10% and 10% respectively (of $1.20 as the benchmark total rate) would be allowed for as 32.5% of $0.729 / (1 – 32.5%) = **$1.08**, i.e. a ***10% reduction***. This results from all premium elements being assumed pro-rata to premium.

Marking guide:

- **½ mark for each of:**
  - **adapted premium rate – one of the above values, depending on 'basis';**
  - **proportional reduction – one of the above, consistent with that rate;**
  - **definitions;**
  - **workings;**
  - **consideration of how to treat commission; and**
  - **consideration of how to treat profit; plus**

- **½ mark for any other reasonable and valid points made;**

to a maximum of 2 marks (SJ).

(d) Discussion of each of the Marketing Manager's suggestions and comments, including an assessment of the likely validity or otherwise, would include:

➢ 1 – 10% lower mortality:

- Assessment of validity: **UNLIKELY** –

  - 10% lower than what? – Before assessing this suggestion, we would need to know what the basic assumptions are in the current YRT basis;
  - Select individual life mortality is most likely assumed to be better than group life mortality due to strength of selection, underwriting etc;
  - Professionals may have better mortality (this is not yet 'established'), but even if they do, that would be as a class and not as individuals who can select for themselves;
  - There may be a difference between mortality of professionals in small business and mortality of other professionals;
  - Better professional mortality may be due to larger average policy sizes and consequent more detailed underwriting; and
  - Further, even if it were established (and that means that the 10% margin is above the aggregate level of select, individually underwritten individual life mortality in the YRT basis), it is likely that such lives are already in the pool assumed for the YRT product. This means that to 'pull them out' and give

them lower rates would require the residual mortality basis for YRT to be increased accordingly – this would need to be considered, as part of the proposals.

➢ 2 – <u>10% lower expenses</u>:

- Assessment of validity: **<u>UNLIKELY</u>** –

    - Again, before assessing this suggestion, we would need to know what the basic assumptions are in the current YRT basis;
    - Expense assumptions are most likely based already on highly automated and fairly 'standardised' processes;
    - 'Exceptions' required to 'tailor' a product to particular circumstances will add to, rather than reduce, expenses; and
    - Any 'savings' in expenses for underwriting may be more than offset by the likely increase in mortality experience that can be expected to emerge.

➢ 3 – <u>Improved persistency (unquantified)</u>:

- Assessment of validity: **<u>UNCERTAIN, but UNLIKELY</u>** –

    - As above for other elements, before assessing this suggestion, we would need to know what the basic assumptions are in the current YRT basis;
    - Small businesses and partnerships may actually be more fluid and/or volatile than individual covers; and
    - As with mortality, even if it were established, it is likely that such lives are already in the pool assumed for the YRT product. This means that to 'pull them out' would require the residual persistency basis for the YRT product to be increased accordingly – this would need to be considered, as part of the proposals.

➢ 4 – <u>Larger average policy sizes (unquantified)</u>:

- Assessment of validity: **<u>UNCERTAIN, but UNLIKELY</u>** –

    - As above for other elements, before assessing this suggestion, we would need to know what the basic assumptions are in the current YRT basis;
    - Also necessary to consider how the current YRT rating structure allows for size of business (e.g. large policy discounts are typical); and
    - As with other elements, even if it were established, it is likely that such lives are already in the pool assumed for the YRT product. This means that to 'pull them out' would require the residual basis for YRT to be adjusted accordingly – this would need to be considered, as part of the proposals.

➢ 5 – <u>Automatic Acceptance Limits ("AALs")</u>:

- Assessment of validity: **<u>HIGHLY UNLIKELY</u>** –

    - This would seriously weaken, if not totally compromise, the select mortality basis for individual cover;

- It is highly inappropriate, given the scope for "anti-selection" under individual business, by comparison with the 'rules-driven' basis for group covers; and
- As stated above under "Expenses", any 'savings' in expenses for underwriting may be more than offset by the likely increase in mortality experience that can be expected to emerge.

➢ 6 – No policy fees or frequency loadings:

- Assessment of validity: **UNLIKELY** –

  - As above for other elements, before assessing this suggestion, we would need to know what the basic assumptions are in the current YRT basis; and
  - It is very likely that this would seriously impact the profitability profile for the business unless there were at least equivalent savings in expenses. As stated above, that is unlikely to the degree that the MM seems to envisage; but even if it was achieved, it can't be 'given back twice' (once in the 10% reduction of expense assumptions built into rates and again by eliminating policy fees and frequency loadings).

➢ 7 – Participation in the GL profit share pool:

- Assessment of validity: **HIGHLY UNLIKELY** –

  - It is very likely that this would seriously impact, if not totally compromise, the profitability profile for the business. Profit shares are usually paid to a group of lives based on the experience of the group and applied in the form of reduced future premiums. Profit sharing is not equitable or practical for the group of lives envisaged in this suggestion.

Marking guide:

- **Up to 1 mark for relevant discussion under each of the above areas (e.g. ½ mark per relevant point in each area), including a reasonable assessment of its likely validity; and**
- **Up to 1 mark for any other reasonable and valid points made, on a similar basis to the above scheme;**

to a maximum of 6 marks (CJ).

(e) Other issues with this proposal include:

- An Issue of "Process": So that potential product development initiatives can be considered in an orderly way by all of the relevant stakeholders collaborating together, it would be preferable that a discussion paper of this sort be circulated in working (draft) form before coming up for review and/or comment by the CEO. This would enable all input to be considered at the earliest possible stage, and may ensure that a range of considerations have been identified before circulation to the executive of BAL. This would also assist in agreement of the next stages in the process, going forward.

- Effects on Existing Business: While these suggestions are still in a very preliminary stage of discussion, there seems to have been only limited consideration to the effects of such an initiative on existing BAL products, distribution channels, and customers. If the proposal were to achieve any of the expectations that have been suggested, there may in fact be significant implications for the current products. BAL may find itself "competing against its own products", so that the business it would otherwise sell on more profitable terms is placed into this new product at much lower levels of profit. The introduction of the suggested product may result in increased lapses and re-entry of existing customers from lapsed policies into the new product on lower levels of premiums, thereby further eroding current profits.

- General "Positioning" of the Suggestions: A number of the elements in this discussion paper appear to derive from the inappropriate translation of "group risk" concepts to an "individual risk" product line. The result is that a number of these elements appear confused and lacking in consistency of integration.

- Non-Professionals Within the Small Business: Small business would typically employ one or more non-professionals (e.g. receptionists etc). Excluding them from the product coverage may significantly reduce its attractiveness, as it would appear discriminatory to such staff. Including them may reduce savings from larger policies and reduced mortality.

- Definition of "Group": Clear guidelines will be required as to what constitutes a target "group" for the purposes of this product.

- Class of Business: The benefits and restrictions of writing this product as Ordinary or Superannuation business will need to be considered.

- Reinsurance: As it is envisaged that larger than average policies will be written under this product, it is likely that reinsurance will be required. Discussions will be required with BAL's reinsurer as to the terms on which they will accept reinsurance of the proposed product.

- An issue of "governance": The discussion paper in its current draft form appears to be at variance from established corporate standards of strategic intent, profit goals, product development standards etc. While it is possible to 'float ideas' for discussion (e.g. sometimes to 'provoke' input), this should always be considered against the essential basis of BAL's corporate goals and the objectives that our Board has identified and codified into our policies and procedures.

Marking guide:

- **½ to 1 mark for relevant explanation of each issue, depending on how relevant the issue and how well presented the explanation; and**
- **½ to 1 mark for any other reasonable and valid points made, on a similar basis to the above scheme;**

to a maximum of 4 marks (CJ).

Markers further note: The solutions set out above are by no means expected in any single answer. They represent a range of answers that may be regarded as acceptable from which any candidate may have taken one particular approach.

QUESTION 5 **(17 Marks)**

Analysis

Component	**Aim**	**KU**	**SJ**	**CJ**	**Total**
Part a)	8, 13, 14	1			1
Part b)	2, 13, 14		2		2
Part c)	1, 3, 13, 14	3			3
Part d)	8, 13, 14		2		2
Part e)	1, 4, 13, 14		4		4
Part f)	8, 13, 14			5	5
Total	**1, 2, 3, 4, 8, 13, 14**	4	8	5	17

Question

You are the Actuary for General Investment Services Ltd (GIS), a small life insurance company owned by a larger financial services group. GIS writes unit linked business, the major product being a directly marketed single premium plan with the following structure:

Single premium	**$10,000**
Term	**3 years**
Benefit amount	**Total value of units at surrender or maturity**
Management fee	**2% of funds each year**
Reserving basis	**102.5% of total unit values**

The Group Finance Director has contacted you, saying that he expects levels of capital to be increased under new standards currently being developed. He believes this is likely to increase reserving by about 1%, taking the basis from 102.5% up to a level of 103.5% in future. He is concerned that this may reduce the yield on transfers for the product. The assumptions, decrements, policy values and transfers for the product are currently as follows:

Assumptions:

Mortality	**(not required - can be ignored)**
Surrender rates	**10% at end of each year**
Initial expenses	**3% of single premium**
Renewal expenses	**1.2% of funds each year after the first**
Investment earning rate	**9% p.a.**
Taxation	**(can be ignored)**

Decrements and policy values:

Year	**In force start of year**	**Surrenders**	**Maturities**	**Policy values ($)**
1	**1**	**0.1**	**-**	**10,682.00**
2	**0.9**	**0.09**	**-**	**11,410.51**
3	**0.81**	**0.081**	**0.729**	**12,188.71**

Current transfers:

Year	Val'n rsv at start of year	Premium	Expenses	Surrender	Interest	Maturity	Val'n rsv at end of year	Transfer
1	-	10,000.00	300.00	1,068.20	873.00	-	9,854.15	-349.35
2	9,854.15	-	115.37	1,026.95	876.49	-	9,473.58	114.74
3	9,473.58	-	110.91	987.29	842.64	8,885.57	-	332.45

(a) Show that the current yield on transfers is about 15.35%. (1 mark)

(b) Explain the meaning and significance for GIS of the result in (a) as a measure of profitability. (2 marks)

(c) Calculate the revised transfers for this product if the reserving basis is changed to 103.5% instead of 102.5%, and estimate the effect that this would have on the yield on transfers. (3 marks)

(d) Explain the main reasons for the result in (c) as compared with the result in (a). (2 marks)

(e) What steps could GIS take to adjust for or offset the effect on its profitability of such a capital increase? What are the potential impacts of these on profits and policyholders? (4 marks)

(f) Draft a brief note to the Group Finance Director discussing the merits, and any shortcomings, of yield on transfers as a measure of profitability compared with other possible measures. (5 marks)

QUESTION 5: SOLUTION (17 Marks)

(a) The present value of transfers at 15.35% is calculated as:

PV $= - 349.35 / (1.1535) + 114.74 / (1.1535)^2 + 332.45 / (1.1535)^3$
$= - 302.86 + 86.23 + 216.61$
$= - 0.02$, which is very close to NIL – as required.

ALTERNATIVE DEMONSTRATION:
The Internal Rate of Return ("IRR" or "yield") on these transfers can be obtained by an automatic calculator, giving a result of 15.34575633%, which is close enough to 15.35%.

Marking guide:

- **½ mark for correct formula;**
- **½ mark for correct result; and**
- **½ mark for correct statement of requirement;**

OR

- **½ mark for correct alternative approach;**

- **½ mark for correct result; and**
- **½ mark for correct conclusion;**

to a maximum of 1 mark (KU).

(b) The significance for GIS of this result as a measure of profitability can be explained as follows:

1. Capital invested by GIS to support the financing of this product is expected to be returned with an earning rate of **15.35%** p.a. – this is therefore the rate of 'return on capital' (or "ROC") that is expected for the product.
2. As an alternative view: the rate of expansion of business that can be sustained under this product *with a given amount of capital available* is **15.35%** p.a. **–** this is therefore the 'self-sustaining growth rate' for this product, on the basis of a fixed amount of capital invested by GIS.

Marking guide:

- **1 mark for rate of 'return on capital' (or "ROC");**
- **1 mark for 'self-sustaining growth rate' for a given amount of capital;**
- **1 mark for any other reasonable and valid points made;**

to a maximum of 2 marks (SJ).

Markers and Examiners note: On the above scheme, a correct answer for only one of the two aspects above, with no further points made, will secure only 1 mark. Students should appreciate and be able to explain both aspects.

(c) The revised transfers for this product if the reserving basis is changed to 103.5% instead of 102.5% are calculated as follows:

➢ ***Year 1: –***

- One adjustment required:
  Val'n rsv at end of year –
  - $9,854.15 x 103.5% / 102.5% = $9,950.29;

- Revised transfer for Year 1 = 10,000 – 300 – 1,068.20 + 873 – 9,950.29
  = - 445.49

  CHECK (or ALTERNATIVE formula): - 349.35 – (9,950.29 – 9854.15)
  = - 349.35 – 96.14
  = - 445.49

➢ ***Year 2: –***

- Adjustment brought forward from Year 1: Val'n rsv at start of year = $9,950.29

- Two further adjustments required:
- Val'n rsv at end of year –
  - $9,473.58 x 103.5% / 102.5% = $9,566.01;

- Interest –
  - $876.49 x (9,950.29 – 115.37) / (9,854.15 – 115.37) = $885.14;

- Revised transfer for Year 2 = 9,950.29 – 115.37 – 1,026.95 + 885.14 – 9,566.01
  = 127.10

  CHECK (or ALTERNATIVE formula):
  114.74 + (9,950.29 – 9,854.15) + (885.14 – 876.49) – (9,566.01 – 9,473.58)
  = 114.74 + 96.14 + 8.65 – 92.43
  = 127.10

➢ ***Year 3: –***

- Adjustment brought forward from Year 1: Val'n rsv at start of year = $9,566.01
- One further adjustment required:
- Interest –
  - $842.64 x (9,566.01 – 110.91) / (9,473.58 – 110.91) = $850.96;

- Revised transfer for Year 3 = 9,566.01 – 110.91 – 987.29 + 850.96 – 8,885.57
  = 433.20

  CHECK (or ALTERNATIVE formula):
  332.45 + (9,566.01 – 9,473.58) + (850.96 – 842.64)
  = 332.45 + 92.43 + 8.32
  = 433.20

IN SUMMARY:	Original (102.5%)	Revised (103.5%)
Year 1	- 349.35	- 445.49
Year 2	114.74	127.10
Year 3	332.45	433.20
Yield:	15.35%	13.90%

Marking guide:

- **½ mark for each of:**
  - **Val'n rsv at end Year 1 [= brought forward at start of Year 2 – don't credit twice for the same value];**
  - **Revised transfer for Year 1;**
  - **Check (or Alternative) calculation of revised transfer for Year 1 [i.e. this can be allowed as a bonus if both calculations are exhibited];**
  - **Val'n rsv at end Year 2 [= brought forward at start of Year 3 – don't credit twice for the same value];**
  - **Interest for Year 2;**
  - **Revised transfer for Year 2;**

- **Check (or Alternative) calculation of revised transfer for Year 2 [i.e. this can be allowed as a bonus if both calculations are exhibited];**
- **Interest for Year 3;**
- **Revised transfer for Year 3;**
- **Check (or Alternative) calculation of revised transfer for Year 3 [i.e. this can be allowed as a bonus if both calculations are exhibited];**

to a maximum of 2½ marks (KU); plus

- **Up to ½ mark (KU) for correct 'revised yield on transfers' (i.e. "lower, by about 1.5% p.a.");**

for a total of 3 marks available (KU).

<u>Markers and Examiners note</u>: On the above scheme, a "reasonably correct answer" is required for the final aspect above in order to secure the last ½ mark – not all students will have a calculator that can provide an IRR directly.

(d) The main reasons for the result in (c) [13.90%] as compared with the result in (a) [15.35%] can be explained as follows:

- The assumed investment earning rate is 9% p.a.
- The current yield on transfers which corresponds to the rate of return on capital ("ROC") is 15.35% p.a. – this arises from a combination of all the assumptions in tandem with the policy structure.
- The imposition of a higher level of capital reserving means that a larger amount is held in the fund at an earning rate of 9%, i.e. below the hurdle rate of ROC.
- The effect of an additional 1% in the reserving basis, at a lower rate of return than the ROC, is to diminish (by 'averaging') the overall rate of ROC.

<u>Marking guide</u>:

Allow up to 2 marks for a lucid and coherent explanation (SJ).

(e) Steps that GIS could take to adjust for or offset the effect on its profitability of such a capital increase may include:

➢ ***<u>Changes to policy structure</u>: –***

- Marginal increase in the Management fee, or different structure of policy charges (e.g. more upfront charges, or introduction of a surrender charge fee scale):

  - Possible to increase fee up from current 2% so that profitability is maintained at around 15.35%.
  - Effectively passes cost of capital onto policyholders, who are benefiting from higher level of security implied in capital reserving. However, as investment is unit linked, this 'benefit' is theoretical at best.

- Prospects for success with this strategy are limited by competitive forces – may in fact be counterproductive in total profit terms.

- Increase in (e.g.) the size or term of business:

  - Possible to increase 'minimum policy size' up from current level so that the average policy size is larger and fixed costs are more proportionately covered by existing charge structure. Goal would be that profitability is maintained at around 15.35%.
  - Alternatively, may be possible to offer as a longer policy term, thus allowing GIS to recoup fees over a longer period (and possibly reduce the annual fee in tandem with this approach).
  - Absorbs higher cost of capital into enhanced business efficiencies.
  - Again, prospects for success are limited by competitive forces – may in fact be counterproductive for total profit if all it does is drive smaller business away. Needs careful cost/benefit analysis to optimise outcomes. Longer term of policy may require surrender charge fee scale (as mentioned in previous point) in order to obtain financially stable profit profile.

➢ ***<u>Compensating offset to capital reserving basis</u>: –***

- Targeted decrease in Reserving basis:

  - Possible to review elements of reserving basis, e.g. which are determined by current GIS policy and procedure for unit linked business.
  - Some of these relate to whether pricing is on "last price" or "next price", what sort of systems are in place (daily vs. weekly; actual vs. model etc), and may be amenable to review.
  - While such review may be beneficial in business terms, the extent to which it can be applied (due to policy conditions etc) and the costs for any implementation would need to be taken into account as part of calculations.

➢ ***<u>Changes to business operations</u>: –***

- Focused program of reduction in levels of expenses:

  - Conceivable to reduce expenses from current levels so that profitability is maintained at around 15.35%.
  - Absorbs higher cost of capital into enhanced business efficiencies.
  - Again, prospects for success are limited by competitive forces – we would assume that there is already very little if any 'slack' in the operational areas of potential efficiency gains.
  - Any reduction of service quality by lower service standards may in fact be counterproductive for total profit if all it does is drive business away. Needs careful cost/benefit analysis to optimise outcomes, including consideration of "Value of In force Business" that may be lost due to an increase in surrenders.
  - Similar comments apply to reductions of commission that may be contemplated.

<u>Marking guide</u>:

- **Up to 1 mark for each reasonable and valid step, including consideration of likely or potential impacts;**
- **1 mark for any other reasonable and valid points made, including consideration of likely or potential impacts;**

to a maximum of 4 marks (SJ).

(f) Note to: Group Finance Director
From: Actuary, GIS
Date: 30 October 2007
Subject: Yield on Transfers as a measure of profitability

Further to our recent discussions, I am providing this note to reflect on the merits, and any shortcomings, of "Yield on Transfers" as a measure of profitability compared with other possible measures.

Definition

The yield on transfers gives the expected rate of return on capital employed ("ROC"). The capital invested by GIS to support the financing of a product is expected to be returned with an earning rate equal to this 'yield' for the product.

Merits

As a measure of profitability, the yield on transfers is a simple and objective determinant that reflects the combined outworking of assumed future experience, product design elements, and business operations. As you are aware, it also reflects the impact of expected levels of the reserving basis, and so allows for the cost of holding capital.

It can also be viewed as the 'self-sustaining growth rate' of the product for a given level of capital available – this can be demonstrated mathematically.

Another advantage of the Yield on Transfers measure is that it enables different products (and the range of features across products) to be compared easily in a single profit measure.

Shortcomings

Yield on transfers is only one measure of profitability. It pays no regard to the dollar value of writing the business, as the RoC may be based on a very small amount of capital.

A further disadvantage of the Yield on Transfers measure is that it is not necessarily consistent with the reported profits in the published accounts, which may be affected by a volatile series of transfers that are 'compacted' (or obscured) by this method, or by different treatment of Deferred Acquisition Costs, etc.

Another possible measure is the present value of projected future profits expressed as a proportion of total assets under management. While this ignores the cost of capital, it is a useful measure of the 'inherent profitability' of the business, reflecting the operational efficiency of GIS operations.

I am happy to discuss any of these comments and issues further with you at any stage.

Yours faithfully,
A. N. Actuary.

Marking guide:

- **½ to 1 mark for relevant discussion of each of the following issues, depending on how relevant the issue and how well presented the discussion:**
  - **Definition of yield on transfers;**
  - **Reflects product design and expected experience;**
  - **Includes the impact of the cost of holding capital;**
  - **Comparable across products;**
  - **Does not indicate dollar value of writing the business; and**
  - **May not be consistent with profit reported in the accounts.**

  and

- **½ to 1 mark for any other reasonable and valid points made, on a similar basis to the above scheme;**

to a maximum of 4 marks (CJ). Plus 1 mark for formatting and language (CJ), for a total of 5 marks. Formatting and language should be appropriate for the situation.

Markers note: This mark only relates to presentation for part (f), as the 'appropriate format and presentation' is only required for that part of the question.

Markers further note: The solutions set out above are by no means expected in any single answer. They represent a range of answers that may be regarded as acceptable from which any candidate may have taken one particular approach.

QUESTION 6 (15 Marks)

Analysis

Component	Aim	KU	SJ	CJ	Total
Part a)	4, 15, 16		6		6
Part b)	4, 7, 15, 16		4		4
Part c)	8, 14,15, 16		2	3	5
Total	**4, 7, 8, 14, 15, 16**		12	3	15

Question

Stratum Wealth Management (SWM) is a financial services group that acquired full ownership of a small Australian life insurance company, Fortitude Life Assurance Company (FLA), at 1 July 2007.

You have just joined SWM as a newly qualified actuary reporting to the Finance Manager. Your first assignment as part of preparations for FLA's year end at 31 December 2007 entails a review of participating business in FLA's No.1 Statutory Fund. This participating business comprises two broad product groups, the first consisting of several series of Whole of Life and Endowment policies issued on a participating basis between 1965 and 1990 ("Traditional"), and the second consisting of a range of Investment Account contracts sold between 1980 and 2005.

The Finance Manager has expressed a range of concerns about the state of these two broad product groups:

- **Their surrender value bases have not been reviewed for many years;**
- **The practices relating to declarations of bonus rates (Traditional) and crediting rates (Investment Account) are ad hoc;**
- **Documentation is either not available or very poor; and**
- **Those staff who knew this business well have left the company in 2007, including the former Appointed Actuary of FLA (and the role is now under contract).**

Despite these concerns, the Fund appears to be in a very strong financial position, with significant unrealised gains (in the order of 20% of total assets). The main focus of the Finance Manager's concerns is the absence of any guidelines for the financial management of this participating business. To meet this requirement, he would like to establish a manual (which he will call "The Policy on Bonuses, Crediting Rates and Surrender Values") to address these issues. The Finance Manager has asked you to undertake preparation of the first draft of these guidelines.

(a) Describe the matters that should be addressed in drafting the policy on bonuses and crediting rates. (6 marks)

(b) For both Traditional and Investment Account business, explain the risks associated with the surrender value bases not having been reviewed for many years. (4 marks)

(c) Describe very briefly the investigations that form part of
- **the monitoring of the experience of the business; and**
- **the management of bonus policy and review of surrender value bases for participating business;**

and describe in detail
- **the linkages that should exist between them.**

(5 marks)

QUESTION 6: SOLUTION **(15 marks)**

(a) Matters that should be addressed in drafting a "Bonus Policy" (as described by the Finance Manager), relating to –

➢ ***1. Traditional (bonus rates) business*****: –**

- The '**bonus philosophy**':
  - A coherent statement of the overall policy that indicates how bonus rates are considered and determined in relation to Traditional business.
  - Provides guidance on the translation of 'principles' into 'practice' – needs to identify both 'the principles' and 'the practice' of bonus declarations.

- How '**amount available for distribution**' is to be determined:
  - Guidelines that indicate how any large 'one-off' features of experience and/or results are to be dealt with – to what degree, and by what means, is smoothing to be adopted? This is particularly important in relation to movement in asset values.
  - The approach to determination of interim rates on death, surrender and/or maturity needs to be explained.
  - Policy and procedure regarding methods – *what* investigations are to be made, *how* do they relate to and integrate with the main financial controls within the company, and *how* are they to be used? E.g. analysis of profits into sources of profit, asset share calculations, bonus supportability investigations etc.
  - Practice relating to 'sources of profit' – what investigations are to be made, and how are the results of these investigations to be used in guiding bonus determinations?
  - Statement of policy as regards competitive considerations – what reference points, if any, are to be considered when setting bonuses on a competitive basis relative to other companies in the market? Are particular surveys regarded as authoritative or critical to the process?

- What **methods** are available to be considered for actual surplus distributions:
  - Do policy terms and conditions require any specific method (or methods)?
  - Are methods of distribution constrained by admin/systems considerations?
  - Are existing methods so well established that the current level of expectations act to reinforce the retention of those methods?
  - Do regulatory requirements impose any particular constraints on the methods

available for actual surplus distributions?

- **Documentation** of all specific requirements and/or practices as they relate to the various 'series' of Participating Traditional business.

  - E.g. there may be "High Bonus" and "Low Bonus" series of products;
  - Established relativity between Whole of Life and Endowment bonus rates; or
  - Historic 'linkages' where products have been acquired via mergers etc; and
  - There may also be 'spreads' between Ordinary and Super classes of business.
  - A particularly important aspect of 'documentation' is the actual past history of declared bonus rates over relevant periods, by type of product and series, and by class of business. This should include the premium rate tables on which the original business was issued.
  - Documentation of the bonus declaration 'systems' (i.e. the computer systems) should also be captured and codified as a reference point available for review.

- Key **procedural matters** should be agreed/confirmed and recorded:

  - The roles of the Board, the Actuary, the Finance Manager etc and the relative levels of authority and accountability;
  - Timeframes for bonus declarations;
  - Stakeholders and their respective interests; and
  - Procedures for announcement and implementation of results.

➢ ***2. Investment Account (crediting rates) business: –***

- The '**crediting rate policy**':

  - A statement of policy that identifies how crediting rates are considered and determined in relation to Investment Account business. Specifically, it should make clear the extent to which the principles are 'discretionary' (or else prescriptive), and how that element of discretion (or prescription) is to be implemented in practice.
  - As with bonuses, it provides guidance on the translation of 'principles' into 'practice', and needs to identify both 'the principles' and 'the practice' of crediting rates declarations.

- How '**amount available for distribution**' is to be determined:

  - As a basic matter, is the 'distribution' (or the crediting rates) required to be based on the whole Statutory Fund, or on a specifically identified portfolio of assets within the Statutory Fund? This is a fundamental point to establish.
  - Guidelines on how any large 'one-off' features of experience and/or results are to be dealt with – to what degree, and by what means, is smoothing to be adopted? This, along with the previous point, is particularly important in relation to movement in asset values.
  - The approach to determination of interim rates on death, surrender and/or maturity needs to be explained.
  - Policy and procedure regarding methods – *what* investigations are to be made,

  how do they relate to and integrate with the main financial controls within the company, and *how* are they to be used? E.g. analysis of profits into sources of profit, asset share calculations, supportable crediting rates investigations etc.
- Practice relating to ‘sources of profit’ – which ‘sources’ do these policies participate in, what (if any) investigations are to be made, and how are the results of such investigations to be used in guiding crediting rate calculations?
- Statement of policy as regards competitive considerations – what reference points are to be considered when considering crediting rates on a competitive basis relative to other companies in the market? Are particular surveys regarded as authoritative or critical to the process?

- What **methods** are available to be considered for actual surplus distributions:

  - Do policy terms and conditions require any specific method (or methods)?
  - Are methods of distribution constrained by admin/systems considerations?
  - Are existing methods so well established that the current level of expectations act to reinforce the retention of those methods?
  - Do regulatory requirements impose any particular constraints on the methods available for actual surplus distributions?

- **Documentation** of all specific requirements and/or practices as they relate to the various ‘series’ of Participating Investment Account business.

  - E.g. there may be “Special Rate” and “Normal Rate” series of products;
  - Any established relativity between Individual and Group crediting rates; or
  - Historic ‘linkages’ where products have been acquired via mergers etc; and
  - There may also be ‘spreads’ between Ordinary and Super classes of business.
  - A particularly important aspect of ‘documentation’ is the actual past history of declared crediting rates over relevant periods, by type of product and series, and by class of business. This should include the premium rates / fees & charges tables on which the original business was issued.
  - Documentation of crediting rate ‘systems’ (i.e. the computer systems) should also be captured and codified as a reference point available for review.

- Key **procedural matters** should be agreed/confirmed and recorded:

  - The roles of the Board, the Actuary, the Finance Manager etc and the relative levels of authority and accountability;
  - Timeframes for crediting rate declarations;
  - Stakeholders and their respective interests; and
  - Procedures for announcement and implementation of results.

<u>Marking guide</u>:

- **1 mark for each element of the matters that should be addressed; PLUS**
- **½ mark for each valid reason given;**

to a maximum of 6 marks (SJ).

<u>Markers and Examiners note</u>: While many of the above points follow similar pattern, there are important elements of difference between "Traditional (bonus rates)" and "Investment Account (crediting rates)" aspects. Although the solution has been set out separately for each (and students may or may not necessarily adopt that approach in their answers), it is important to credit the 'common points' just once, and only give additional marks where essential elements of difference have been highlighted. It is therefore important NOT to 'double credit' for what is basically the same point just being restated for both lines of business.

(b) The risks associated with the surrender value ("SV") bases not having been reviewed for many years, relating to –

- ***<u>1. Traditional business</u>: –***

- Potential risk – '**threat to profitability/solvency**':

  - Out of date SV bases can affect profit results either by unintended losses due to over-generous SVs or by abnormal profits from overly conservative SVs.
  - While unintended losses would be of primary concern, abnormal profits may also lead to 'issues or problems' for the company.
  - While there appears no immediate prospect of threat to solvency (given the "very strong financial position" and most of the profits or losses accruing to policyholders), it is a potential threat over time if the SV basis is not kept under regular monitor and review procedures.

- Key risk – '**compromise of equity**':

  - Out of date SV bases are very likely to affect equity between different groups of policyholders at particular times, or generations of policyholders over time, as over-generous SVs or overly conservative SVs will affect specific groups of policyholders in different ways and to varying degrees.
  - Depending on the company's 'SV philosophy', a current very strong financial position with large unrealised gains may reflect that the SV basis is too harsh and not giving adequate and equitable returns to surrendering policyholders.
  - Further it is likely that the degree of any inequity impacts different types of policies, bonus series, and classes of business to varying degrees.

- Potential risk – '**compromise of marketability**':

  - Overly conservative SVs would reduce the company's competitive position. While this may not be a major focus for closed lines of business, it can have flow-on effects that may impact reputation or distribution channel confidence.
  - As stated above, a current very strong financial position with large unrealised gains may reflect a SV basis that is too harsh and not giving sufficient weight to the competitive considerations.

- Potential risk – '**prospect of non-compliance**':

  - Overly conservative SVs may result in paying levels of SV that are below the required minimum. While this is generally 'unlikely', it could arise under a given set of circumstances.

- ***2. Investment Account (IA) business*: –**

- The risks **– similar to Traditional business**, with the following distinctions:

  - By comparison with Traditional business, the elements of SVs for IA business are generally much more prescriptive in terms of established terms and conditions of the relevant policies.
  - There may be some 'surrender factors' for IA business that are dynamic and intended to be responsive to asset values etc. If these are not kept up to date and under regular monitor and review procedures, there is potential for similar issues to those listed above for Traditional business. In that case, there may be risks of threat to profitability and/or solvency (unlikely in the current situation).
  - While 'equity' is generally less of concern (given the much more prescriptive nature of SVs for IA business), the above situation of dynamic 'surrender factors' for IA business that are intended to be responsive to asset values and may have become 'out of date' would represent a clear case of compromise to equity (and not at all unlikely, if the current large unrealised gains are in any way relevant to SVs for IA business).
  - For similar reasons to above, the significance of competitive position and marketability may be relatively less for IA business.
  - By comparison with Traditional, the SVs for IA business may be exposed to a greater risk of non-compliance, either with the required minimum levels or with the more prescriptive policy terms and conditions.

Marking guide:

- **1 mark for reasonable explanation of each risk;**

to a maximum of 4 marks (SJ).

Markers and Examiners note: While many of the above points follow similar pattern, there are important differences between "Traditional" and "Investment Account" aspects. The solution has tried to recognise these, and it is important again to credit the 'common points' just once, only giving additional marks where essential elements of difference have been highlighted. It is important NOT to 'double credit' for what is basically the same point just being restated for both lines of business.

Markers further note: The solutions set out above are by no means expected in any single answer. They represent a range of answers that may be regarded as acceptable from which any candidate may have taken one particular approach.

(c) The linkages that should exist between:
  - the investigations that form part of monitoring the experience of the business, and

- the management of bonus policy and review of surrender value bases for participating business

can be described as follows:

- Investigations that form part of '**monitoring the experience of the business**' for participating business include:

  - The annual valuation of policy liabilities and analysis of profit by sources; and

  - Targeted experience investigations for the consideration of appropriate 'best estimate assumptions' relating to –
    - insurance elements (mortality),
    - non-economic elements (voluntary discontinuance),
    - economic basis elements (investment earnings rates), and
    - other elements (expenses, inflation);

- The management of '**bonus policy**' and review of '**surrender value ("SV") bases**' for participating business require consideration of:

  - Measurement of profit for participating business, and analysis of profit by sources;

  - Targeted experience investigations relating to –
    - the insurance element (mortality),
    - non-economic elements (voluntary discontinuance),
    - economic basis elements (investment earnings rates), and
    - other elements (expenses, inflation);

- Assumptions made of the expected experience for participating business in each of the above elements should be consistent between the various systems, i.e. the valuation, analysis of profit, bonus investigations, and SV investigations should use essentially the very same assumption sets for expected future experience.
- In particular, valuations of policy liabilities under Australian standards as relating to participating business require the assumption of a 'best estimate supportable rate of future bonus or crediting rate' which should be related logically and consistently to the equivalent rate for purposes of "management of bonus policy". These are corresponding views of the same business for different purposes, and it is fundamental that the assumptions and elements of the business as reflected in these respective views of the business must be logical and consistent.
- Likewise, the expected surrender experience that is assumed as the rates of voluntary discontinuance for the valuation should be essentially the same as for the review of SV bases. Targeted experience investigations relating to voluntary discontinuance should feed consistently into assumption sets for expected future experience adopted in valuations of policy liabilities and in review of SV bases and related investigations.
- Under the matters that should be addressed in a Bonus Policy (as set out in part (a) of the question), reference was included to "sources of profit" as a possible driver to the process of distribution of surplus. Clearly this contemplates an analysis of profit which must exhibit essential consistency with that emanating

from the annual valuation of policy liabilities and analysis of profit by sources. It "goes without saying" that these corresponding views of the same business for different purposes must be related in a logical and consistent manner.

Conclusion:
This topic is related to "actuarial control cycle" for life insurance as an integrated whole business view. Experience is directly reflected into assumptions on a consistent basis, which are then used to determine measures of profit (and analysis, e.g. sources), to manage the relevant aspects of the business (bonus policy and SV monitor and review processes), and feeds back into the experience of the business.

Marking guide:

- **½ mark for each part of "monitoring experience of the business", max 1 marks;**
- **½ mark for each part of "bonus policy" and "review of SV basis", max 1 marks;**

to a maximum of 2 marks (SJ); plus

- **1 mark for good explanation of each linkage; and**
- **1 mark for any other reasonable and valid points made;**

to a maximum of 3 marks (CJ);

for a total of 5 marks available.

END OF EXAMINATION