

INSTITUTE AND FACULTY OF ACTUARIES

EXAMINATION

November 2016

Subject CA3 – Communications

Paper 2

Time allowed: 2 hours

INSTRUCTIONS TO THE CANDIDATE – ONLINE VERSION

1. *The work you submit MUST be saved in Microsoft PowerPoint 2007 format, e.g. using the pptx file extension.*
2. *You have two hours to prepare and upload your exam attempt.*
3. *You may print one copy of your slides in preparation for giving the presentation tomorrow. You are not permitted to make any further copies of your presentation.*
4. *Copies of Formulae and Tables and core reading for subjects CT1–CT8 inclusive and CA1 will be available electronically during the exam. These documents are for your use during the exam period only and not for general use. No other material can be referred to.*
5. *In addition to this paper you should have available your own electronic calculator from the approved list, <https://www.actuaries.org.uk/studying/prepare-your-exams/authorised-calculators>.*
6. *You are not permitted to use the internet to help you during the exam.*
7. *You are required to work through the exam assignment without assistance from another person. You are reminded that by undertaking this exam you are bound by the Institute and Faculty of Actuaries' Examinations Rules and Regulations. By submitting your files you are confirming that all material is entirely your own work and you wish this to be taken into account for this assessment. Only the first submission will be accepted.*
8. *Save your work regularly. Saving your work is your responsibility so failure to do so will not be a significant mitigating circumstance.*
9. *At the end of the exam, save your presentation and follow the upload instructions that have been provided. All related material that you have printed including slides, notes, etc. must be confidentially stored until we have informed you to delete/destroy them once the exam is over. Do Not log off the application until you receive confirmation of receipt from the Online Education Team.*
10. *If you encounter any difficulties please email online_exams@actuaries.org.uk or call the Online Education Team on +44 (0)1865 268255.*
11. *Professional behaviour is mandatory and no material relating to the exam may be disclosed or discussed with others, nor used in a further attempt at the exam. Failure to comply with this will be deemed to be a breach of the examination regulations and may result in disciplinary action.*

PLEASE NOTE THAT THE CONTENT OF THIS PAPER IS CONFIDENTIAL AND STUDENTS ARE NOT TO DISCUSS OR REVEAL THE CONTENTS UNDER ANY CIRCUMSTANCES.

You work for Hinchcliffe Consultants, specialising in advising life insurance companies on developing new products. One of your clients, BDR Insurance, writes a variety of life and non-life policies. You have received the following email from your manager Georg:

Hi Liesel,

I received the email below from Maria at BDR Insurance. As you know we have been helping them design a new life insurance product and as part of our remit we have devised a sales strategy which we will be discussing with them at our meeting next week.

However, as you will see from her email (below) Maria has suggested a different strategy. I would therefore like you to give a short presentation, at the start of the meeting, addressing the points raised in Maria's email below.

What Maria suggests below could be done within the regulations that govern BDR. However, my initial reaction is that the proposals would not work with the life insurance product that we have been designing with BDR, primarily because the product will be sold through financial advisers. However, it would be best to speak with Kurt so that you can fully understand what he discussed with Maria. We should be open to new strategies that we think may increase the profitability of our clients. The life assurance market is very competitive and anything that gives our client a slight edge over the competition should be considered. I am just not convinced that Maria's proposal is the correct approach for the new product.

No need to stray from the points she makes in the email below though – addressing this proposal is sufficient and there is no need to come up with an alternative – I'll be presenting our overall proposed strategy immediately after your presentation so I can handle that part then. I'd suggest you cover the following:

- *a brief recap of the results of the study on home insurance lapse rates that was discussed between Maria and Kurt (no need for too much detail here – just the basic message would be fine);*
- *suggest you also include a graph of the lapse rates for home insurance and life insurance;*
- *an explanation of why Maria's proposal would not be appropriate for a life insurance product (focus on anti-selective lapses being a key driver) together with an illustration of life insurance lapse rates; and*
- *an illustration of the effect that increasing premium rates has on profitability of life insurance policies with appropriate conclusion(s).*

You will have eight to ten minutes for your part, and please do not overrun as we only have a limited time with the sales director.

Thanks,

*Georg
Senior Actuary
Hinchcliffe Consultants*

On 27th January, Maria Von Trapp wrote:

Dear Georg,

Thank you very much for inviting me to the drinks reception that your firm hosted last week, it was a lovely evening. While I was there I chatted to one of your colleagues, Kurt, about behavioural economics and it has since got me thinking about the product development that we are planning over the coming months.

Kurt mentioned a recent study suggesting that policyholder inertia is one of the biggest driving forces in the insurance industry. I understand that this means that it is difficult to get individuals to switch policies, and they are reasonably insensitive to price changes of an existing policy. I wonder if we should use this knowledge when designing our new life insurance policy. I was thinking of an initial term of five years with very low premiums to encourage individuals to purchase the product, with premiums rising for the remaining term of the policy.

I would propose setting the premium rates for the first five years with no allowance for any profit margin to ensure we are very competitive in the market, and increase rates to make significant profits in the remaining term. Perhaps you could cover this at our meeting next week, as the sales director will be present, and while he will not want to hear all of the actuarial detail behind the pricing (not being an actuary himself), he will certainly be keen to hear what you have to say on sales strategy.

See you next week.

Kind regards,

Maria
Deputy Sales Manager
BDR Insurance

Kurt has given you the following information:

Home insurance policies:

- The study that I discussed with Maria was based on home insurance which is renewable annually. The study increased premiums when policies were up for renewal and recorded the percentage of policyholders who renewed their policy. The following results were recorded:

Increase in premiums	Percentage of policyholders renewing	Percentage of policyholders lapsing
0%	96%	4%
10%	95%	5%
20%	93%	7%
30%	90%	10%
40%	88%	12%
50%	83%	17%
60%	75%	25%
70%	63%	37%
80%	49%	51%
90%	35%	65%
100%	20%	80%

The study shows that increases in premiums of up to 50% are possible without significant lapsing of policies.

- The study went on to show the profit margin for home insurance policies implied by the increase, and the change in revenue that resulted:

Increase in premiums	Profit margin	Change in revenue
0%	30%	-4%
10%	40%	4%
20%	50%	12%
30%	60%	17%
40%	70%	23%
50%	80%	25%
60%	90%	20%
70%	100%	7%
80%	110%	-12%
90%	120%	-34%
100%	130%	-60%

- It should be noted that BDR home insurance policies are not sold through financial advisers. Policyholder behaviour is very different when policies are sold through financial advisers, as is typically the case with life insurance. Financial advisers will reduce policyholder inertia by encouraging policyholders to lapse their existing policy if better premium rates are available elsewhere. They are incentivised to do this

because they will be paid additional commission if they sell a new policy and clearly this is in their clients' interests.

Life Insurance policies

- A recent study within the financial adviser led life insurance industry suggested that increases in premiums can lead to anti-selective lapses – a process where a lot of healthy lives lapse to get better premium rates elsewhere, but the unhealthy lives keep their policy because they would have to pay a higher premium to buy a new policy. The increased concentration of unhealthy policyholders increases claims rates.
- Based on this study, the following lapse rates (i.e. percentage of policyholders lapsing) were observed following a one-off increase after five years.

Increase in rates	Lapse rate of healthy lives	Lapse rate of unhealthy lives	Total lapse rate
0%	4%	1%	4%
2%	10%	2%	9%
4%	13%	2%	12%
6%	18%	2%	16%
8%	27%	4%	25%
10%	41%	5%	37%
12%	49%	7%	45%
14%	57%	10%	52%
16%	62%	9%	57%
18%	65%	11%	60%
20%	70%	12%	64%

Unhealthy lives were defined in the study as the 10% of policyholders in the worst health. Healthy lives are the remaining 90% of policyholders. The unhealthy lives have an average mortality of over five times the mortality of the lives classified as healthy.

- Based on the lapse rates in the study, projections of the premiums and claims for the proposed BDR product are shown below. The table shows the premiums and claims expected over the five years following the increase. The projections assume that before the premium increase no profit loading is priced into the premiums. The differences in claims and premiums shown below are purely a result of the change in mix of healthy and unhealthy lives due to the different lapse rates of the two groups.

Increase in premiums	Projected premiums	Projected claims	Profit*	Profit margin
0%	24,075,000	24,277,500	- 202,500	-0.8%
2%	23,154,000	23,240,000	- 86,000	-0.4%
4%	22,906,000	22,767,500	138,500	0.6%
6%	22,154,000	21,980,000	174,000	0.8%
8%	20,331,000	20,377,500	- 46,500	-0.2%
10%	17,215,000	18,080,000	- 865,000	-4.8%
12%	15,456,000	16,635,000	- 1,179,000	-7.1%
14%	13,594,500	15,097,500	- 1,503,000	-10.0%
16%	12,557,000	14,402,500	- 1,845,500	-12.8%
18%	11,918,000	13,745,000	- 1,827,000	-13.3%

*Profit shown here is purely premiums minus claims for illustrative purposes and expenses and the cost of capital would need to be paid out of this figure before the insurance company actually made a profit from the policies.

All of the figures and information provided is correct for the purposes of the question. There is no need to calculate further figures for the presentation. You are not expected to comment on the features of life insurance business, or how it differs to other lines of insurance, beyond the information that is specifically covered in the question. You are not required to comment on other risks inherent in Maria's strategy other than those specifically mentioned in the question.

END OF PAPER