

INSTITUTE AND FACULTY OF ACTUARIES

EXAMINATION

Specimen 2019

Subject CP1 – Actuarial Practice

Paper Two

Time allowed: Three hours and Fifteen Minutes

INSTRUCTIONS TO THE CANDIDATE

1. *Enter all the candidate and examination details as requested on the front of your answer booklet.*
2. *You must not start writing your answers in the booklet until instructed to do so by the supervisor.*
3. *You have 45 minutes of planning and reading time before the start of this examination. You may make separate notes or write on the exam paper but not in your answer booklet. Calculators are not to be used during the reading time. You will then have two hours 30 minutes to complete the paper.*
4. *Mark allocations are shown in brackets.*
5. *Attempt both questions, beginning your answer to each question on a new page.*
6. *Candidates should show calculations where this is appropriate.*

AT THE END OF THE EXAMINATION

Hand in BOTH your answer booklet, with any additional sheets firmly attached, and this question paper.

In addition to this paper you should have available the 2002 edition of the Formulae and Tables and your own electronic calculator from the approved list.

You work for an actuarial consultancy company, which provides specialist actuarial advice to life and general insurance companies. Your boss has just asked you to complete two assignments.

Assignment 1. XYZ Insurance

Background

XYZ insurance sells two main products in the term assurance market – one with limited underwriting upfront, the other asks significant questions on the lifestyle of the proposed application form. XYZ insurance also sells annuity business, and has a defined benefit pension scheme for its staff.

XYZ insurance has provided the following information on the mortality experience for its term assurance and annuity books over the last two years.

Product	Actual number of deaths in last two years	Expected number of deaths in last two years
Limited underwriting Term assurance	1,000	750
Lifestyle Term Assurance	800	750
Annuity	2,400	2,200

The Trustees have provided the following information on the defined benefit pension scheme:

Membership	Actual number of deaths in last two years	Expected number of deaths in last two years
Deferred Pensioners	0	10
Pensioners	250	400

- The defined benefit pension scheme invests in a range of assets, with a current asset mix of 25% equities, 50% government bonds and 25% corporate bonds.
- The equity portfolio is a mix of UK and overseas equities, and has materially decreased in value over the last two years. This fall in value is thought to be because overseas equities have performed badly.
- The scheme has gone from having a surplus two years ago to having a deficit of £80m now.

Mortality Assumptions

An independent expert has reviewed the mortality experience of the whole country that the insurance company operates in, using the last two years of mortality experience from information provided by the country's national statistics office.

The independent expert has concluded that the improvement rate in life expectancy has slowed compared to previous predictions by the same expert two years ago.

The political opponents of the government have argued this is because of fewer medical advances in recent years due to a lack of investment in medical research, and if they were elected in the next election they would significantly increase investment in medical research. They have also proposed to make smoking illegal in the country.

The actuarial director of XYZ insurance has asked for an analysis to be done to support the setting of mortality assumptions for reserving for its next annual valuation for its annuity, term assurance business, and defined benefit pension scheme. In addition he would like to understand any options available to XYZ to manage future mortality risk.

Company Defined Benefit Pension Scheme

XYZ Insurance has just employed a new Finance Director, who has come from outside the Insurance industry. The new Finance Director has expressed concerns about the potential volatility of XYZ Insurance's defined benefit pension scheme. She is particularly concerned that XYZ insurance may need to put significant funding into the company's defined benefit pension scheme to reduce the scheme's deficit. She has indicated the maximum that the company would be prepared to put into the scheme over the next 5 years would be £50m.

The Finance Director would like a better understanding of the risks for XYZ associated with its pension scheme, and the options open to XYZ to manage these risks.

Other Information

Your boss has also provided you with some additional information about changes that are potentially going to be made by the government which are relevant for this assignment. The government is considering:

- increasing interest rates in the near future
- allowing defined benefit pension schemes to offer transfer values to existing deferred members, where previously this was not possible
- relaxing the current regulatory requirements around the asset classes that can be held within a defined benefit pension scheme.

Questions for Assignment 1

XYZ insurance has employed your company to provide answers to the questions raised by its Actuarial Director and its Finance Director.

Your boss has asked you to produce answers to the following questions for XYZ insurance.

Note your work needs to link to the information provided in the background information and should discuss/outline areas of professionalism/actuarial advice as required. [Note: Limited credit will be given to solutions where generic answers have been given that do not refer back to the information provided.]

1. Discuss the areas to be considered in approaching and completing an analysis to enable the mortality assumptions for the annual valuation of each of the business lines to be agreed. [13]
2. Outline the areas of the analysis which still have potential uncertainty in the future and explain how these could be addressed in the valuation. [7]
3. Suggest non-investment based risk management tools that could be used to control the mortality experience for the insurance business. [5]
4. Discuss the main risks for the defined benefit pension scheme from XYZ's perspective. [7]
5. Discuss how the investment strategy for the defined benefit pension scheme could be used to reduce the risks outlined in part 4. [8]
6. Discuss other options (including de-risking) available to the defined benefit pension scheme to reduce the risks outlined in part 4. [9]
7. Outline how the Finance Director of XYZ could fund the £50m that may be required to assist the funding of the scheme. [3]

[Sub Total 52]

Assignment 2. ABC Insurance

Background

ABC insurance company writes motor insurance business in a particular developed country.

The government is concerned that motor insurance premiums have risen significantly in recent years, and motor insurance could become unaffordable for many drivers. The government has an objective of ensuring motor insurance cover is affordable for all drivers. The government believes that motor insurance premiums have been rising for the following reasons:

1. Increasing expenses due to overly complicated forms and then an overly complicated claims process.
2. Lack of competition

The government is therefore proposing that insurers make the following changes for motor insurance:

- The application process is simplified, by limiting the number of questions an insurance company can ask to three questions.

- The claims handling process is speeded up such that the maximum amount of time an insurer can investigate any claim to be two weeks from the date of the claim request
- New entrants are encouraged into the market, by the government offering low interest loans, only payable back once profits have met a certain criteria.
- Introducing a “black box” to all cars which record driving ability and drivers trips, and allowing all insurance companies access to all drivers information via a central computer system run by the Government.
- Guaranteeing that motor insurance prices could only rise in line with inflation for policyholders who have been claim free for the last three years.

ABC Insurance Concerns

ABC insurance has stated that in their opinion the real reason for increased premiums has been because of the following:

- Increased accidents because of criminal activities in certain areas of cities of the country
- Increase in number of younger drivers having more powerful cars
- Increased expenses from new regulation changes.

ABC insurance has also mentioned that the proposals of the Government may not achieve its aims because:

- The insurance companies risk processes would need to be reviewed which could be costly
- The insurance companies risk management activities may be affected in an adverse way by the government’s proposals
- The costs of implementing the proposals will be high, and this additional cost will be passed on to policyholders

Questions for Assignment 2

ABC insurance has employed your firm to advise it about the potential implications of the government proposals to amend motor insurance.

Your boss has asked you to produce answers to the following questions for ABC insurance.

Note your work needs to link to the information provided in the background information and should discuss/outline areas of professionalism/actuarial advice as required. Limited credit will be given to solutions where generic answers have been given that do not refer back to the information provided.

1. Outline the types of advice that you can give to the insurance company. [3]
2. Explain the role of the government in regulating insurance companies [3]
3. Discuss the implications for the insurance company’s processes and profit if the government’s proposals were to go ahead.

[17]

4. Suggest any alternative options that could be proposed to the government to help with achieving affordable cover for all drivers but with lower impacts on ABC. [5]
5. Discuss how the insurance company could fund the changes required should the government proposals go ahead. [10]
6. Discuss approaches the insurance company could use to manage its capital. [10]

[Sub Total 48]

[Total 100]