

INSTITUTE AND FACULTY OF ACTUARIES

EXAMINATION

21 April 2011 (pm)

Subject ST7 — General Insurance: Reserving and Capital Modelling Specialist Technical

Time allowed: Three hours

INSTRUCTIONS TO THE CANDIDATE

1. *Enter all the candidate and examination details as requested on the front of your answer booklet.*
2. *You have 15 minutes at the start of the examination in which to read the questions. You are strongly encouraged to use this time for reading only, but notes may be made. You then have three hours to complete the paper.*
3. *You must not start writing your answers in the booklet until instructed to do so by the supervisor.*
4. *Mark allocations are shown in brackets.*
5. *Attempt all seven questions, beginning your answer to each question on a separate sheet.*
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.

<i>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.</i>

- 1 A consulting actuary has been asked to provide best estimates of the reserves for a book of business having been given the following data (in £000's):

Cumulative Paid Claims Development

<i>Underwriting</i>	<i>Development Year</i>			
<i>Year</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>
2007	2,010	3,950	4,471	4,718
2008	2,960	4,377	5,237	
2009	2,102	4,032		
2010	2,450			

Reported Outstanding Claims

<i>Underwriting</i>	<i>Development Year</i>			
<i>Year</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>
2007	2,964	1,636	516	283
2008	4,500	1,313	730	
2009	2,933	1,589		
2010	3,751			

Reported Claims Development

<i>Underwriting</i>	<i>Development Year</i>			
<i>Year</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>
2007	4,974	5,586	4,987	5,001
2008	7,460	5,690	5,967	
2009	5,035	5,621		
2010	6,201			

Chain Ladder Cumulative Development

		<i>Development Year</i>		
	<i>1-ult</i>	<i>2-ult</i>	<i>3-ult</i>	<i>4-ult</i>
	0.9423	0.9742	1.0028	1.0000

Chain Ladder Ultimate Claims

<i>Underwriting</i>	<i>Ultimate</i>
<i>Year</i>	<i>Claims</i>
2007	5,001
2008	5,984
2009	5,476
2010	5,843

- (i) Comment on the development data provided and hence the suitability of the chain ladder method for assessing the ultimate claims for this line of business.

[5]

Further investigation has shown that this class consisted entirely of business written in an overseas country whose currency devalued by 50% relative to sterling at the beginning of 2009, with exchange rates before and after this devaluation being relatively stable. The incremental claims paid have been converted to sterling at rates of exchange applicable at the time of payment and outstanding claims at the rates of exchange applicable at the time reported.

- (ii) Calculate the IBNR for this class of business by suitable adjustment of the data, commenting on whether the results are now reasonable. [11]

For three other classes, the following figures for underwriting year 2009, with amounts in £000's, have been provided:

<i>Line of Business</i>	<i>Premium: P</i>	<i>Expected Loss Ratio: ELR</i>	<i>Incurred Claims: C</i>	<i>Development Factor to Ultimate df</i>	<i>Chain Ladder Ultimate</i>	<i>Bornhuetter- Ferguson Ultimate</i>
<i>Travel Insurance</i>	2,373	95%	2,573	1.100	2,830	2,778
<i>Medical Malpractice</i>	3,700	90%	1,410	2.100	2,961	3,154
<i>Employers' Liability</i>	2,915	85%	3,500	0.950	3,325	3,370

- (iii) Explain with reasons which of the Chain Ladder and Bornhuetter-Ferguson Ultimates are better measures of the expected ultimate claims for each of these lines of business. [6]
[Total 22]

- 2 Company B has reinsured Company A, a direct insurance company, for several years. Company B informed Company A on 30 September 2010 that the reinsurance arrangements between the companies would cease in respect of new business and renewals with effect from 1 January 2011. Company B to relieve itself of all its liabilities to Company A at 31 December 2010 using a commutation arrangement.

The reinsurance arrangements comprise:

- (a) A 50% quota share treaty covering Company A's employers' liability business.
- (b) An excess of loss treaty covering Company B's motor business with a limit of £400,000 excess of £100,000 (each and every claim).

There are three known motor claims outstanding in Company A's books where a recovery from Company B is expected under the treaty, as follows:

	<i>Date of Claim</i>	<i>Expected Recovery</i>	<i>Recovery to Date</i>
<i>Claim 1</i>	5 June 2006	£400,000	
<i>Claim 2</i>	31 August 2009	£300,000	£200,000
<i>Claim 3</i>	1 July 2010	£200,000	

Describe the considerations that each company would need to take into account in forming a view on an appropriate level of payment under the commutation arrangements for each line of business. [16]

3 A Lloyd's syndicate currently writes business only in the United Kingdom. It has been offered a large book of business comprising household insurance in Japan which is being fronted by a Japanese insurance company.

(i) Explain why an insurer may use a fronting arrangement rather than underwriting a risk directly, commenting on how this may be different for a Lloyd's syndicate. [2]

(ii) Outline the appropriateness of each of the main types of reinsurance arrangements for the above syndicate's book of business. [5]
[Total 7]

4 (i) Define "exclusion" in the context of insurance policy wordings. [1]

(ii) Explain, giving examples, why a general insurance company might use exclusions in its policy wordings for household insurance. [11]
[Total 12]

5 List the benefits provided, and insured perils commonly covered, by personal travel insurance. [4]

6 A small UK based general insurance company, writing a number of lines of business, has recently gone into run-off.

Describe how an ALM (Asset Liability Model) could be built to assist in investment decisions, including the inputs that would be required. [10]

7 A recent report produced by the Capital Modelling team for a large insurer contained the following table:

Economic Capital Requirements

<i>Risk</i>	<i>£m</i>
Credit	750
Market	500
Operational	750
Diversification	–300

(i) Define credit risk and operational risk. [2]

(ii) Describe, giving examples, potential sources of operational risk that the insurance company might face. [10]

(iii) Describe how to parameterise an operational risk model and any difficulties associated with doing so. [8]

The company wishes to reduce its capital requirements and has asked for suggestions of ways in which it might do this.

(iv) Suggest ways to mitigate the potential financial impacts faced by the company for each of the following risks:

- (a) Credit
- (b) Market
- (c) Operational

[6]

The introduction of a new risk management strategy has been suggested that will cost £50m to implement and is expected to reduce the company's non-insurance risk by 30%. The company's capital requirement for non-insurance risk is 15%.

(v) Determine whether the company should pursue the suggested new strategy.

[3]

[Total 29]

END OF PAPER