MTH5126 - Statistics for Insurance

Academic Year: 2022-23 **Semester: B**

Worksheet 10

You are recommended to use Excel spreadsheet to perform your calculations for run-off triangles.

Q1. Ruin theory (Excel-based)

Individual claim amounts are exponentially distributed with mean 1 and the premium loading factor is θ. The formula for the probability of ultimate ruin, $\Psi(U)$ is:

$$\Psi(U) = \frac{1}{1+\theta} \exp\{-\frac{\theta U}{1+\theta}\}$$

i) Plot a chart showing how the probability of ruin varies for values of θ ranging from 0 to 1, when $U = 0.5$.

ii) Comment on what can be concluded from your chart in part (i).

Q2. Run-off triangles

(i) Explain why insurance companies make use of run-off triangles.

(ii) The run-off triangle below shows incremental claims incurred on a portfolio of general insurance policies.

	Development Year			
Policy Year	*0*	*1*	*2*	*3*
2011	4,657	3,440	931	572
2012	6,089	5,275	1,381	
2013	5,623	4,799		
2014	7,224			

Calculate the outstanding claims reserve for this portfolio using the basic chain ladder method.

Further practice:

As usual, after each lecture and tutorial, check that you can now do the lecture examples/questions and tutorial questions without looking at the answers.