

ACSC/STAT 4703, Actuarial Models II

Fall 2017

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Homework Sheet 7

Due: Friday 25th November: 10:30 PM

Basic Questions

1. An insurance company has the following data on its policies:

Policy limit	Losses Limited to			
	20,000	50,000	100,000	500,000
20,000	1,000,000			
50,000	7,040,000	8,010,000		
100,000	23,600,000	28,400,000	30,700,000	
500,000	5,050,000	5,340,000	5,500,000	5,930,000

Use this data to calculate the ILF from \$20,000 to \$500,000 using

- (a) The direct ILF estimate.
(b) The incremental method.
2. For a certain line of insurance, the loss amount per claim follows an exponential distribution with mean θ . If the policy has a deductible per loss set at 0.5θ and a policy limit set at 4θ , by how much will the expected payment per loss increase if there is inflation of 4%?
3. An insurance company charges a risk charge equal to the square of the average loss amount, divided by 10,000. It has the following data on a set of 600 claims from policies with limit \$500,000.

Losses Limited to	20,000	50,000	100,000	500,000
Total claimed	4,050,000	5,340,000	5,500,000	5,930,000

Calculate the ILF from \$100,000 to \$500,000.

Standard Questions

4. An insurer calculates the ILF from \$1,000,000 to \$2,000,000 on a particular policy is 1.074. The average loss per unit of exposure with the policy limit of \$1,000,000 is \$664. The insurer's premium also includes a risk charge equal to the square of the expected loss divided by 2,000. A reinsurer is willing to provide excess-of-loss reinsurance of \$1,000,000 over \$1,000,000 (that is, the attachment point is \$1,000,000 and the limit on the reinsurer's payment is \$1,000,000) for a premium of \$58. Calculate the premium the insurance company should charge for a policy with limit \$2,000,000

- (a) If they do not buy the excess-of-loss reinsurance
- (b) If they buy excess-of-loss reinsurance.

5. An insurer computes the following trend factors for different policy limits:

Policy Limit	\$50,000	\$100,000	\$500,000	\$1,000,000	none
Trend factor	1.03	1.05	1.055	1.059	1.06

The insurance company buys excess-of-loss reinsurance of \$500,000 over \$500,000 on its policies with policy limit \$1,000,000. The loading on this reinsurance is 25%. The reinsurance premium is currently 5% of the insurer's expected loss payments. Calculate the reinsurance premium as a percentage of insurer's expected loss payments after applying the trend factors.