

ACSC/STAT 4703, Actuarial Models II
 Fall 2018
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 Homework Sheet 7
 Due: Friday 24th 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	2,500,000			
50,000	9,360,000	10,200,000		
100,000	21,800,000	24,200,000	28,060,000	
500,000	4,390,000	5,020,000	5,880,000	6,060,000

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 a Pareto distribution with parameters $\alpha = 3$ and θ . If the policy has a deductible per loss set at 0.1θ and a policy limit set at 4θ , by how much will the expected payment per loss increase if there is inflation of 3%?
3. An insurance company charges a risk charge equal to the square of the average loss amount, divided by 20,000. It has the following data on a set of 600 claims from policies with limit \$1,000,000.

Losses Limited to	20,000	50,000	100,000	500,000	1,000,000
Total claimed	9,350,000	11,630,000	13,380,000	14,400,000	15,020,000

Calculate the ILF from \$100,000 to \$1,000,000.

Standard Questions

4. An insurer calculates the ILF from \$500,000 to \$1,000,000 on a particular policy is 1.081. The average loss per unit of exposure with the policy limit of \$1,000,000 is \$1,329. The insurer's premium also includes a risk charge equal to the square of the expected loss divided by 5,000. A reinsurer is willing to provide excess-of-loss reinsurance of \$500,000 over \$500,000 (that is, the attachment point is \$500,000 and the limit on the reinsurer's payment is \$500,000) with a loading of 20%.

- (a) Calculate the average loss per unit of exposure for a policy with limit \$500,000.
- (b) Calculate the premium the insurance company should charge for a policy with limit \$1,000,000 if they buy excess-of-loss reinsurance.
5. An insurer computes a trend factors of 1.059 for policies with limit \$500,000. 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 30%. The reinsurance premium is 5% of the insurer's expected loss payments. After the trend factors are applied, the reinsurer's loading decreases to 25%, and the reinsurance premium becomes 5.3% of insurer's expected losses. What is the trend factor for policy limit \$1,000,000?