7. (1.75 points)

Given the following information:

- Allocated loss adjustment expense is 15% of the indemnity amount.
- The variance method has been selected to include a risk load in the Increased Limits Factors (ILFs) with $k = 0.000064$ and $\delta = 0$.

Limit, l	$E[X;l]$	$E[X^2:l]$
1,000	840	790,123
5,000	2,485	9,467,456

a. (1 point)

Calculate the following:

- The risk loads for each limit.
- The ILF with and without risk load for the 5,000 limit.

b. (0.75 point)

Assuming portfolio weights of 75% for a 1,000 limit and 25% for a 5,000 limit, determine the overall impact on premium by using the ILFs with the risk loads instead of the ILFs without risk loads.

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QUESTION 7

TOTAL POINT VALUE: 1.75	**LEARNING OBJECTIVE(S): B1b**

SAMPLE ANSWERS

Part a: 1 point

Risk load = k[E[x^2;l] + $\delta[E[X;l]^2]$
δ = 0
risk load @ 1000 = 0.000064 [790,123] = 50.568
risk load @ 5000 = 605.92

ILF(5k) w/o risk load = $\frac{2485(1.15)}{840(1.15)} = \mathbf{2.958}$

ILF(5k) w/ risk load = $\frac{2485(1.15)+605.92}{840(1.15)+50.568} = \mathbf{3.4072}$

Part b: 0.75 point

Sample 1

$$\frac{.75X + .25(3.407X)}{.75X + .25(2.958X)} - 1 = +\mathbf{7.54\%}\ \boldsymbol{increase\ in\ premium}$$

Sample 2

Average ILF w/o risk loads = [1*(.75) + 2.9583*(.25)] = 1.4896
Average ILF w/ risk loads = [1*(.75) + 3.4072*(.25) = 1.6018

Overall Impact (dollar)
1.6018 – 1.4896 = .1122

Sample 3
Assume base premium of 1000
Average ILF w/o risk loads = [1000*(.75) + 1000*2.9583*(.25)] = 1489.575
Average ILF w/ risk loads = [1000*(.75) + 1000*3.4072*(.25) = 1601.80

1601.80 / 1489.575 – 1 = 0.0753

EXAMINER'S REPORT

Candidates were expected to understand the properties of ILFs, how to calculate an ILF when provided with an ALAE provision and how to calculate it when accounting for risk loading.

Part a

Candidates were expected to know how to calculate an ILF both with and without a risk load. Given the parameters k and δ, they were expected to first calculate the risk load for each limit.

Common mistakes included:

- Not multiplying the expected ground-up losses by the ALAE percentage in the ILF with risk load calculation

- Multiplying both expected ground-up losses and the risk loads by the ALAE percentage when calculating the risk-loaded ILF
- Using the wrong definition of the risk load function by multiplying the k-multiplier with the variance of the ground-up loss distribution

Part b

Candidates were expected to know how to calculate an average ILF given portfolio weights and the premium impact of using ILFs with risk loads versus ILFs without risk loads.

No base premium was given, and therefore any base premium used was given full credit. However, the base premium assumed must be consistent when calculating both average ILFs.

Common mistakes included:

- Calculating a weighted average of premium (with and without risk load) and determined the impact (this was the most common mistake)
- Applying the ILF to the 75% of the portfolio at the 1,000 limit (as opposed to applying it to the 25% of the portfolio that is at the 5,000 limit)
- Calculating an ILF with risk load at the 1,000 limit (this should be 1.000)