

7. (2 points)

Given the following information for the past year for an insurance company:

	(\$000)	% Fixed
Written Premium	25,000	-
Earned Premium	20,000	-
Agent Commission	3,000	0%
Other Acquisition Cost	300	100%
Premium Tax & Licensing Fees	1,000	0%
General Expense	2,500	100%
Loss Adjustment Expenses	1,200	0%

- Underwriting profit provision = 5%.

a. (0.75 point)

Calculate the underwriting expense ratio using the premium-based projection method.

b. (0.25 point)

Calculate the operating expense ratio using the premium-based projection method.

c. (0.25 point)

Calculate the total permissible loss ratio.

d. (0.75 point)

Calculate the indicated rate change using a projected loss ratio of 65% (excluding loss adjustment expenses).

SAMPLE ANSWERS AND EXAMINER'S REPORT

QUESTION 7

TOTAL POINT VALUE: 2

LEARNING OBJECTIVE(S): A4, A5

SAMPLE ANSWERS

Part a: 0.75 point

Sample 1

$$\text{U/W Expense Ratio} = (3000 + 300 + 1000)/25000 + 2500/20000 = 0.297$$

Sample 2

Expense	Fixed	Variable
Agent Comm.	0%	$3000/25000 = 12\%$
Other Acquis.	$300/25000 = 1.2\%$	0%
Tax	0%	$1000/25000 = 4\%$
General	$2500/20000 = 12.5\%$	0%
Total	13.7%	16%

$$\text{U/W Expense Ratio} = 13.7\% + 16\% = 29.7\%$$

Part b: 0.25 point

Sample 1

$$\text{Operating Expense Ratio} = \text{U/W Expense Ratio} + \text{LAE/Premium} = 29.7\% + 1200/20000 = 35.7\%$$

Sample 2

$$\text{LAE Ratio} = 1200/20000 = 6\%$$

$$\text{Operating Expense Ratio} = \text{U/W Expense Ratio} + \text{LAE Ratio} = 13.7\% + 16\% + 6\% = 35.7\%$$

Part c: 0.25 point

Sample 1

$$\text{Total PLR} = 1 - \text{U/W Expense} - \text{Profit} = 1 - 0.297 - 0.05 = 0.653$$

Sample 2

$$\text{Fixed Expense Ratio} = 300/25000 + 2500/20000 = 0.137$$

$$\text{Variable Expense Ratio including LAE} = (3000 + 1000)/25000 + 1200/20000 = 0.22$$

$$100\% = (\text{TPLR} + \text{Fixed}) / (1 - \text{Variable} - \text{Profit}) = (\text{TPLR} + 0.137) / (1 - 0.22 - 0.05)$$

$$\text{TPLR} = 0.593$$

Sample 3

$$\text{Total Permissible Loss Ratio} = 1 - \text{Operating Ratio} - \text{Profit} = 1 - 35.7\% - 5\% = 59.3\%$$

Part d: 0.75 point

Sample 1

$$\text{Variable Expense} = 0.297 - 300/25000 - 2500/20000 = 0.16$$

SAMPLE ANSWERS AND EXAMINER'S REPORT

Fixed Expense = $0.297 - 0.16 = 0.137$

Indicated Rate Change = $(0.65 + 0.06 + 0.137)/(1 - 0.16 - 0.05) - 1 = 0.07215 = 7.215\%$

Sample 2

Fixed Expense = $300/25000 + 2500/20000 = 0.137$

Variable Expense = $0.297 - 0.137 = 0.16$

Indicated Rate Change = $(0.65 + 0.137)/(1 - 0.16 - 0.05) - 1 = -0.38\%$

Sample 3

Fixed Expense Ratio = $300/25000 + 2500/20000 = 0.137$

Variable Expense Ratio including LAE = $(3000 + 1000)/25000 + 1200/20000 = 0.22$

Indicated Rate Change = $(0.65 + 0.137)/(1 - 0.22 - 0.05) = 1.07808$ or 7.808%

Sample 4

Indicated Rate Change = $(65\% + 300/25000 + 2500/20000)/(1 - (4000/25000 + 1200/20000) - 5\%) - 1$
 $= (65\% + 1.2\% + 12.5\%)/(1 - (16\% + 6\%) - 5\%) - 1$
 $= 78.7\%/73\% - 1$
 $= 7.81\%$

EXAMINER'S REPORT

Candidates were expected to calculate the underwriting expense, operating, and total permissible loss ratios using the correct premium base and to calculate the indicated rate change using the premium-based projection method.

Multiple solutions were allowed, including:

1. Using LAE as a variable expense (as opposed to a loss expense) in the permissible loss ratio and indicated rate change calculations in parts c and d.
2. Excluding LAE in the calculation of the indicated rate change in part d.

Part a

Candidates were expected to calculate the agent commission, other acquisition cost, and premium tax & licensing fee ratios using written premium and the general expense ratio using earned premium and to calculate the underwriting expense ratio including all 4 expenses.

Common errors included:

- Using the wrong premium base to calculate one or more of the expense ratios without an appropriate assumption.
- Excluding one or more of the expenses in the total underwriting expense ratio calculation.

Part b

Candidates were expected to calculate the operating expense including all underwriting expenses as well as the LAE ratio to earned premium.

SAMPLE ANSWERS AND EXAMINER'S REPORT

Common errors included:

- Using the written premium to calculate the LAE ratio.
- Excluding one or more of the expenses in the operating ratio calculation.
- Including profit in the operating ratio instead of the LAE ratio.

Part c

Candidates were expected to calculate the total permissible loss ratio. The calculation could or could not include LAE in the total permissible loss ratio depending on how LAE was treated throughout the problem.

Common errors included:

- Calculating the variable permissible loss ratio instead of the total permissible loss ratio.
- Not subtracting out profit from the total permissible loss ratio.

Part d

Candidates were expected to calculate the indicated rate change as either a factor or percentage of premium. Candidates were also expected to know that the premium-based projection method was appropriate given the information in the problem.

Common errors included:

- Using the all-variable expense method.
- Using the wrong premium bases to calculate the fixed and variable expense ratios.
- Multiplying the given loss ratio by $1 + \text{LAE}/\text{EP}$ instead of adding the LAE/EP ratio.
- Mixing up which expenses were fixed vs. which were variable.
- Excluding the profit provision.