

7. (2 points)

Given the following:

Class	Earned Exposures	Reported Loss and ALAE	Current Relativity
A	10,500	\$512,000	1.00
B	5,200	\$740,000	1.50
C	13,100	\$632,000	1.30

- Full credibility standard is 13,260 exposures.
- Partial credibility is determined based on the square root rule.
- The complement of credibility is no change.

Calculate the indicated rate change for each class that results in a revenue-neutral overall change.

EXAM 5 SPRING 2017 SAMPLE ANSWERS AND EXAMINER'S REPORT

QUESTION 7

TOTAL POINT VALUE: 2

LEARNING OBJECTIVE(S): A8

SAMPLE ANSWERS

Sample 1

	Pure	Indicated	Current	Normalized		Cred Wtd
Class	Premium	Relativity	Relativity	Curr Rel	Credibility	Ind Rel
A	48.76	.7454	1.00	.8152	.89	.7531
B	142.31	2.1754	1.50	1.2228	.63	1.8193
C	48.24	.7375	1.30	1.0597	.99	.7394
Total	65.42		1.2267	1.0000		.9394

	Cred Wtd	Relativity	Change w/
<u>Class</u>	<u>Normalized</u>	<u>Change</u>	<u>Off Balance</u>
A	.8017	-19.8%	-1.7%
B	1.9367	29.1%	58.4%
C	.7871	-39.5%	-25.7%
Total	1.0000	-18.5%	0.0%

Sample 2

	Pure	Indicated	Current	Normalized		Cred Wtd
<u>Class</u>	<u>Premium</u>	<u>Relativity</u>	<u>Relativity</u>	<u>Curr Rel</u>	<u>Credibility</u>	<u>Ind Rel</u>
A	48.76	.7454	1.00	.8152	.89	.7531
B	142.31	2.1754	1.50	1.2228	.63	1.8193
C	48.24	.7375	1.30	1.0597	.99	.7394
Total	65.42		1.2267	1.0000		.9394

	Cred Wtd	Relativity	Change w/
<u>Class</u>	<u>Normalized</u>	<u>Change</u>	<u>Off Balance</u>
A	1.0000	0.0%	-1.7%
B	2.4157	61.1%	58.4%
C	.9818	-24.5%	-25.7%
Total	1.2473	1.7%	0.0%

- Pure Premium = Reported Loss and ALAE / Earned Exposures = 512,000/10,500 = 48.76
- Indicated Relativity = Pure Premium / Total Pure Premium = 48.76/65.42=.7454
- Normalized Current Relativity = Class Relativity / Average Class Relativity = 1/1.2267=.8152
- Credibility = (Exposures/Standard)^0.5 = (10,500/13,260)^0.5 =.89
- Credibility Weighted Indicated Relativity = Indicated Relativity * Credibility + Normalized Current Relativity * (1 – Credibility) = .7454*.89+.8152*.11=.7531
- Credibility Weighted Normalized Relativity
 - Sample 1: Class Credibility Weighted Indicated Relativity / Average Credibility Weighted Indicated Relativity = .7531/.9394=.8017
 - Sample 2: Class Credibility Weighted Indicated Relativity / Class A Credibility Weighted Indicated Relativity = .7531/.7531=1.0000

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- $\text{Relativity Change} = \text{Credibility Weighted Normalized Relativity} / \text{Current Relativity} = .8017/1.00 - 1 = -19.8\%$
- $\text{Change with Off Balance} = (1 + \text{Relativity Change}) / (1 + \text{Average Relativity Change}) - 1 = (1 + 0.0) / (1 + 0.017) - 1 = -1.7\%$

EXAMINER'S REPORT

Candidates were expected to know how to generate rating differentials, apply credibility standards, and off-balance to rate neutral.

Common errors included:

- Using the current rebased rates as the complement of credibility after calculating the rating differentials as a percent of the weighted average.
- Using 1 as the complement of credibility.
- In calculating and applying the off-balance, not comparing the new relativities (either raw, rebased, or relative to the weighted average) against the old relativities using the same basis.
- Inverting the off-balance factor.