Reading: Werner 09: Risk Classification

Model: Univariabe Methods for Rating Variable Differentials Pure Premium Method - With Credibility & Off-Balance Problem Type:

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

Given

level			
of		reported	current
variable	EE	L + ALAE	relativity
1	173	117,640	1.220
2	429	296,010	1.000
3	163	61,940	0.620

* EE = Earned Exposures

Full credibility:

12,320 exposures

Use the square-root rule for credibility. Complement of credibility is no change.

Step 1 complete the following table and note the key columns:

(Col 5) = indicated relativity

(Col 8) = current relativity (normalized so that the exposure-weighted average equals 1.000)

(Col 9) = weighted average of (Col 5) and (Col 8) using (Col 6) as the weight for (Col 5)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
level							normalized	cred-wtd
of		reported	pure	indicated	credibility	current	current	indicated
variable	EE	L + ALAE	premium	relativity	(weights)	relativity	relativity	relativity
Α	192	111,360	580	1.142	0.141	1.53	1.874	1.771
В	399	199,500	500	0.985	0.203	0.40	0.490	0.590
С	159	69,960	440	0.867	0.128	1.00	1.225	1.179
Total	750	380,820	507.760	1.000	-	0.816	1.000	1.017

- (4) = (3) / (2)
- (5) = (4) / (Tot4)
- = sqrt[(2) / 9660] (maximum value is 1.0) (6)
- (7) given information

(Tot7) = exposure-weighted average of (7)

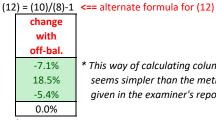
- (8) = (7) / (Tot7)
- (9) $= [(6) \times (5) + (1.0 - (6)) \times (8)]$

= exposure-weighted average of (9) (Tot 9)

Step 2 calculate the % change in relativity <u>from</u> current <u>to</u> credibility-weighted indicated, but note:

- you must first normalize the cred-wtd indicated relativity as shown in (Col 10)
- you must then "off-balance" the change in (Col 11) so that the total change is 0.0% in (Col 12)

(1)	(10)	(11)	(12)
level	normalized		change
of	cred-wtd		with
variable	ind. rel.	change	off-bal.
Α	1.741	13.8%	-7.1%
В	0.580	45.1%	18.5%
С	1.159	15.9%	-5.4%
Total	1.000	22.5%	0.0%



* This way of calculating column (12) seems simpler than the method given in the examiner's report.

(final answers in green)

- (10) = (9) / (Tot9)
- (11) = (10) / (7) 1.0
- (12) = (1.0 + (11)) / (1.0 + (Tot11)) 1.0