15. (4.75 points)

Given the following information for a book of business as of December 31, 2016:

Accident Year	Cumulative Reported Loss & ALAE ($000)
2014	5,615
2015	4,315
2016	2,745

Calendar Year	Earned Premium ($000)
2014	10,800
2015	11,250
2016	12,375

Selected Reported Loss & ALAE Age to Age Factors		
12-24	24-36	36-48
2.089	1.368	1.070

- All policies are annual.
- Exposures are written evenly throughout each calendar year.
- Annual loss and ALAE trend = 5%.
- Annual premium trend = 4%.
- There has been one rate change in the past five years: +5%, effective July 1, 2015.
- Fixed expense ratio = 15%.
- Variable expense ratio = 25%.
- Profit and contingencies provision = 5%.
- ULAE provision = 6% of loss and ALAE.
- Rates are to be in effect for one year.
- There is no loss development beyond 48 months.

a. (0.5 point)

Calculate the ultimate losses and ALAE for each accident year using the loss development technique.

b. (0.75 point)

Calculate the ultimate losses and ALAE for each accident year using the Bornhuetter-Ferguson technique using an expected loss and ALAE ratio of 56%.

c. (0.5 point)

Briefly justify an appropriate ultimate loss and ALAE selection from parts a. and b. above for accident years 2014 through 2016.

d. (3 points)

Calculate the indicated rate change for policies effective July 1, 2017 using the ultimate loss and ALAE selections from part c. above, assuming full credibility.

CONTINUED ON NEXT PAGE

QUESTION 15

TOTAL POINT VALUE: 4.75 | **LEARNING OBJECTIVES: A2, A3, A4, A5, B3, B8**

SAMPLE ANSWERS

Part a: 0.5 point

AY	Reported Loss+ALAE	CDF	Ultimate Loss+ALAE = Reported Loss+ALAE * CDF
2014	5615	1.07	6008
2015	4315	1.464	6317
2016	2745	3.058	8394

Part b: 0.75 point

AY	EP	Expected Loss+ALAE = 56% * EP	CDF	% Unreported = 1 - 1 / CDF	Unreported Loss+ALAE = % Unrep * Exp Loss	Reported Loss+ALAE	Ultimate Loss+ALAE = Unrep + Rep
2014	10800	6048	1.070	6.5%	393	5615	6008
2015	11250	6300	1.464	31.7%	1997	4315	6312
2016	12375	6930	3.058	67.3%	4664	2745	7409

Part c: 0.5 point

Any two of the following:

- Results for 2014 and 2015 are similar, select either technique (or an average)
- Selected B-F method because 2016 is immature
- 2016 CDF is highly leveraged, selected BF method
- B-F is more stable
- B-F is credibility weighted between loss development and expected loss ratio
- B-F method is not responsive to the loss ratio increase so I selected the development method
- Rate change causes the expected loss ratio used in the B-F method to be inappropriate, selected development method
- Both methods overstate the ultimate but the development method more so, used B-F method
- Calculating loss ratios and concluding that they are different than the given ELR, which makes the B-F method inappropriate

Part d: 3 points

Using Bornhuetter-Ferguson method:

AY	EP	Average Rate Level	On-Level Factor	Premium Trend	On-Level Trended EP
2014	10800	1.000	1.050	1.04^4	13268
2015	11250	1.006	1.044	1.04^3	13213
2016	12375	1.044	1.006	1.04^2	13470
					39951

Trend from average earned date of CY 7/1/YY to average earned date of prospective period 7/1/2018

Trend from average accident date of CY 7/1/YY to average accident date of prospective period 7/1/2018 for loss

AY	Ultimate Loss+ALAE	Loss Trend	Trended Ultimate Loss+ALAE	Ultimate Trended Loss+ALAE Ratio	Ultimate Trended Loss+LAE Ratio
2014	6008	1.05^4	7306	55.1%	58.4%
2015	6312	1.05^3	7309	55.3%	58.6%
2016	7409	1.05^2	8172	60.7%	64.3%
			22787	57.0%	60.5%

(Candidates can select any reasonable Ultimate Trended Loss+LAE Ratio)

Indication = [(60.5% +15%) / (1 – 25% – 5%)] – 1 = 7.8%

Using Development Method:

AY	EP	Average Rate Level	On-Level Factor	Premium Trend	On-Level Trended EP
2014	10800	1.000	1.050	1.04^4	13268
2015	11250	1.006	1.044	1.04^3	13213
2016	12375	1.044	1.006	1.04^2	13470
					39951

Trend from average earned date of CY 7/1/YY to average earned date of prospective period 7/1/2018
Trend from average accident date of CY 7/1/YY to average accident date of prospective period 7/1/2018 for loss

AY	Ultimate Loss+ALAE	Loss Trend	Trended Ultimate Loss+ALAE	Ultimate Trended Loss+ALAE Ratio	Ultimate Trended Loss+LAE Ratio
2014	6008	1.05^4	7306	55.1%	58.4%
2015	6317	1.05^3	7315	55.4%	58.7%
2016	8394	1.05^2	9259	68.7%	72.8%
			23880	59.8%	63.4%

(Candidates can select any reasonable Ultimate Trended Loss+LAE Ratio)

Indication = [(63.4% +15%) / (1 – 25% – 5%)] – 1 = 12.0%

EXAMINER'S REPORT

Candidates were expected to develop losses using both the loss development and Bornhuetter-Ferguson techniques. They were expected to know the strengths and weaknesses of these techniques, and when it would be appropriate to use each. They were also expected to be able to calculate the basics of ratemaking including, on-level, trend, and expense factors.

Part a

Candidates were expected to calculate and apply a cumulative development factor.

Common errors included:

- not applying cumulative development factors
- trending the losses when it was not asked for

Part b

Candidates were expected to use the Bornhuetter-Ferguson method to estimate ultimate losses.

A common mistake was on-leveling and/or trending the premium used in the expected loss calculation.

Part c

Candidates were expected to select a method of loss development for each year and provide a justification of each selection.

Common errors included:

- not making a selection
- not having two distinct justifications

Part d

Candidates were expected to calculate on-level factors and trend factors with the appropriate trend periods. They were expected to apply these to the premium and ultimate selected losses to develop loss ratios. A selected loss ratio then had to be adjusted by expenses to develop an indicated rate need.

Common errors included:

- miscalculating average rate level factors
- determining trend period incorrectly
- not applying trend or ULAE to losses