8. (2.25 points)

An insurance company is using the following data to determine an appropriate large loss threshold and excess loss factor for use in its overall ratemaking calculation:

Accident Year	Reported Loss Including Severity Trend ($000)	Number of Claims Greater than $500,000	Excess Ratio at $500,000
1999	56,261	8	5.5%
...	...	...	...
2011	56,793	5	3.6%
2012	57,049	11	6.3%
2013	50,038	7	3.6%
Total	813,339	121	4.8%

- Excess ratio is the ratio of excess loss dollars to non-excess loss dollars.
- Total number of claims in accident years 1999 to 2013 = 12,435.

The following information is given for accident year 2014:

- Total reported losses including severity trend = $46,902,000.
- Total reported ALAE = $2,345,000.
- Loss and ALAE development factor = 1.08.
- Unlimited severity trend factor = 1.05.
- Unlimited frequency trend factor = 0.98.
- $500,000 limit applies to loss only. Individual claims, including severity trend, greater than $500,000 are:

Claim	Reported Loss Including Severity Trend
1	$504,000
2	$644,000
3	$817,000
4	$975,000

a. (1 point)

Calculate the 2014 excess ratio at $500,000 and justify a recommended excess ratio to be used in the company's overall rate indication.

b. (1.25 points)

Calculate the 2014 projected ultimate losses and ALAE using an excess loss procedure.

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EXAM 5 SPRING 2015 SAMPLE ANSWERS AND EXAMINER'S REPORT

QUESTION: 8

TOTAL POINT VALUE: 2.25

LEARNING OBJECTIVE(S): A4

SAMPLE/ACCEPTED ANSWERS:

Part a: 1 point

Sample 1:

Claim	Excess
1	4,000
2	144,000
3	317,000
4	475,000
Total	940,000

Actual Excess to Non-Excess Ratio = 940 / (46902 – 940) = 2%
Even though the actual excess ratio is only 2%, I would select the 4.8% ratio as derived from the historical averages. This is a much more credible factor given it has enough history to smooth out the peaks and valleys in the volatility from year-to-year.

Sample 2:

Claim	Excess
1	4,000
2	144,000
3	317,000
4	475,000
Total	940,000

Actual Excess to Non-Excess Ratio = 940 / (46902 – 940) = 2.045%
Recommend all year average = [4.8% x 15 + 2.045%] / 16 = 4.65%
The all year average provides stability, especially useful since excess losses tend to be volatile.

Sample 3:

Reported losses: 46,902
Excess losses: 504 + 644 + 817 + 975 – 2000 = 940
Excess ratio: 940 / (46902 – 940) = 2.04%
The excess ratio used should be based on 1999 – 2014 experience i.e. balance stability.
This is [2.04 x 46,902 + 4.8 x 813,339] / (46,902 + 813,339)

EXAM 5 SPRING 2015 SAMPLE ANSWERS AND EXAMINER'S REPORT

Sample 4:

Excess dollars for 2014 = 4,000 + 144,000 + 317,000 + 475,000 = 940,000
Excess ratio = 940,000 / (46,902,000 – 940,000) = 2.05%
Since there is a lot of variation in the excess ratio in the historical data, I would choose an excess ratio based on data from 1999 to 2014 to have a more stable result and not overestimate or underestimate the values.
1999 – 2013 Excess losses: x / (813,339 – x) = 0.048 → x = 37,252.17
1999 – 2014 Excess losses = 940 + 37,252.17 = 38,192.17
1999 – 2014 Reported losses = 813,339 + 46,902 = 860,241
Excess ratio = 38,192.17 / (860,241 – 38,192.17) = 4.65%

Sample 5:

Claim	Reported	LDF	Ultimate	Excess 500K
1	504,000	1.08	544,320	44,320
2	644,000	1.08	695,520	195,520
3	817,000	1.08	882,360	382,360
4	975,000	1.08	1,053,000	553,000
Total				1,175,200

Excess ratio = 1,175,200 / (46,902,000 x 1.08 – 1,175,200) = .02375
I recommend using the long term ratio of 4.8%, more than 1 year of losses needs to be considered as these events are infrequent and a short-term provision will be large in the years following many large losses and small in years following times with fewer large losses.

Sample 6:

Total excess losses = 2,940,000 – 4 x 500,000 = 940,000
Excess Ratio = 940,000 / (46,902,000 – 940,000) = 2.045%
I recommend using the average of the latest 3 years' excess ratios because there appears to be much annual fluctuation and the 2014 ratio appears relatively low. Hence, will use 4.5%.

Sample 7:

Claim	Reported Loss	Excess Loss
1	504,000	4,000
2	644,000	144,000
3	817,000	317,000
4	975,000	475,000
Total		940,000

Total reported loss = 46,902,000
2014 Excess ratio = 940,000 / (46,902,000 – 940,000) = .020451677

I would recommend using the long term average excess ratio weighted with the recent excess ratio by number of claims. Large losses can be volatile. Important to include long term.
Use = [.02045 x 4 + .048 x 121) / 125 = .047

Sample 8:

2014 excess reported loss including sev > 500,000 = 940,000
2014 Excess loss ratio = 940,000 / (46,902,000 – 940,000) = .02045
As the excess ratios have been volatile, I would use the average of the last four years, including 2014 as an excess ratio = .0388 → 3.9%.

Sample 9:

Claim	Reported	Trend	Untrended	Excess 500K
1	504,000	1.05	480,000	0
2	644,000	1.05	613,333	113,333
3	817,000	1.05	778,095	278,095
4	975,000	1.05	928,571	428,571
Total				820,000

Untrended total reported loss for AY 2014 = 46,902,000 / 1.05 = 44,668,571
Non-excess loss for AY 2014 = 44,668,571 – 820,000 = 43,848,571
2014 Excess ratio = 820,000 / 43,848,571 = 1.87%
As losses above excess are highly uncertain and volatile, I would recommend to use a stable and more credible all year weighted ratio of 4.8% rather than an immature year excess ratio computed.
Therefore, recommend excess ratio = 4.8%.

Part b: 1.25 points

(46,902,000 – 940,000) x 1.08 x 0.98 x 1.048 = 50,981,197.48
2,345,000 x 1.08 x 1.05 x 0.98 = 2,606,045.40
50,981,197.48 + 2,606,045.40 = 53,587,242.88

EXAMINER'S REPORT:

General Commentary

Candidates performed poorly on this question, with few candidates receiving more than 50% of the available points. While candidates appeared to understand the individual components of the excess ratio and how to calculate the projected ultimate, they struggled to combine all components together correctly.

EXAM 5 SPRING 2015 SAMPLE ANSWERS AND EXAMINER'S REPORT

Part a

Limited Loss: The candidate was expected to calculate the excess portion of the claims with reported loss amounts greater than $500K and the total limited loss. Common errors included:

- Incorrectly calculating the excess portion of the claims with total reported loss greater than $500K
- Interpreting the total loss of 46,902,000 as exclusive of the claims with total reported loss greater than $500K

Excess Ratio: The candidate was expected to use the excess losses and limited losses calculated previously to determine the excess ratio. The majority of candidates received credit for this calculation.

Selection: The candidate was expected to make a selection of an appropriate large loss load. Generally, candidates did very well. Candidates needed to consider multiple years in the calculation, such as calculating weighted averages of the 1999 – 2013 with the 2014 ratio using total reported loss, total limited loss, claim counts, or number of years as weight. A common mistake was simply averaging the 1999 – 2013 average with the 2014 ratio.

Justification: The candidate was expected to give appropriate justification for their selected excess ratio. The candidate should discuss at least one of volatility, stability, and/or smoothing. Most common errors included stating "credibility" as a justification, or stating the current accident year is not credible without alluding to the volatility inherent in excess ratios.

Part b

Excess Load: The candidate was expected to correctly include an excess load in the calculation using the limited losses calculated in part a. as well as the excess load selected in part a. The most common errors included:

- Applying the selected excess ratio to total reported losses
- Applying the selected excess ratio to ALAE

Loss Frequency: The candidate was expected to apply the frequency factor to loss. The most common error was stating that frequency trend did not apply because no specific "trend-to" date was given. Since the candidate was supplied a frequency and severity trend factor, as opposed to the pure premium trend factor, the candidate was expected to include a provision for loss frequency.

ALAE Frequency: The candidate was expected to apply the frequency factor to ALAE. The most common error was stating that frequency trend did not apply because no specific "trend-to" date was given. Since the candidate was supplied a frequency and severity trend factor, as opposed to the pure premium trend factor, the candidate was expected to include a provision for ALAE frequency.

ALAE Severity: The candidate was expected to apply the severity trend factor to ALAE. The most common errors included:

- Stating the severity trend did not apply because no specific "trend-to" date was given. Since the candidate was supplied a frequency and severity trend factor, as opposed to the pure premium trend factor, the candidate was expected to include a provision for ALAE severity.
- Applying the severity trend factor to loss and ALAE. The factor should only apply to ALAE since loss had already been adjusted for severity trend.

Loss and ALAE Development: The candidate was expected to apply the development factor to both trended, smoothed loss and to trended ALAE. The most common errors included:

- Applying the development factor to loss, but not to ALAE
- Not applying the development factor to the excess loss provision