5. (6.5 points)

A countrywide insurer's rate filing for a state contains the following:

- All policies are annual.
- The filed rates are planned to be in effect for policy year 2015.
- There was a rate change of +7.5%, effective 7/1/2013. The prior rate change before that was in 2009.
- Loss trend is 3% annually.
- ULAE as a ratio of loss and ALAE = 10%.
- Profit and contingencies provision = 5%.
- Variable expense ratio = 20%.
- The company purchased new software in 2010 to assist with the processing of claims.
- Use an average of 2012 and 2013 for the rate level indication.

Calendar Year	Earned Premium ($000)
2012	1,250
2013	1,400

Accident Year	Reported Loss and ALAE ($000)
2012	750
2013	500

Calendar Year	Current Level Average Policy Premium	Fixed Expense Ratio
2009	$500	10%
2010	$520	23%
2011	$540	15%
2012	$560	12%
2013	$583	10%

	Reported Loss and ALAE Development Factors				
Accident Year	12-24 Months	24-36 Months	36-48 Months	48-60 Months	60+ Months
2006	1.45	1.35	1.10	1.02	1.00
2007	1.50	1.30	1.15	1.08	1.00
2008	1.40	1.35	1.10	1.03	1.00
2009	1.50	1.30	1.08	1.02	
2010	1.85	1.15	1.10		
2011	1.75	1.15			
2012	1.80				
All Year Average	1.61	1.25	1.11	1.04	1.00
5 Year Average	1.66	1.23	1.11	N/A	N/A
3 Year Average	1.80	1.20	1.09	1.04	1.00
Average Excluding High/Low	1.60	1.25	1.10	1.03	1.00

a. (5.5 points)

Calculate the indicated rate change. Justify the selections of premium trend, all development factors, and the fixed expense ratio.

b. (1 point)

The chief actuary is concerned about the credibility of company data in this state and would like to begin using credibility weighting with the company's countrywide loss costs. Assess this approach, considering two desirable qualities of a credibility complement.

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EXAM 5 SPRING 2014 SAMPLE ANSWERS AND EXAMINER'S REPORT

QUESTION: 5

TOTAL POINT VALUE: 6.5

LEARNING OBJECTIVE(S): A3, A4, A5, A6, A12

SAMPLE/ACCEPTED ANSWERS:

Part a: 5.5 points

Sample 1:

Premium
2012: 1250*(1.075/1.00)*1.04^3.5=1541
2013: 1400*(1.075/((1/8)*1.075+(7/8)))*1.04^2.5=1645
Trend using CL APP = 4%
Trend period 7/1/## to 1/1/2016

Losses
2012: 750*1.30295(24-ult)*1.03^3.5 (loss trend) * 1.1 (ULAE)=1192
2013: 2.3453*10.3^2.5*1.1=1389
Trend 7/1/## to 1/1/2016

Age to age
12-24: 1.8 – used 3 yr. avg because of new software impact (past no longer ind. of future or similar)
24-36: 1.15 – 2009 and prior is different due to new software
36-48: 1.10 – used avg x Hi/Low as experience seems to be similar even with software change
48-60: 1.03
60-Ult: 1.00 – no tail

Fixed Expense
-exclude 2010 (likely high due to new software)
-simple avg = 11.75%

LR 2012: 0.774
LR 2013: 0.844
Avg: 0.809

Ind = (0.809 + 0.1175)/(1-.05-.2) – 1 = 23.5%

Sample 2 (fixed expense):

There is a spike in fixed expense in 2010 due to purchase of new software. Thus select avg (2011-2013) to prevent distortion.

(0.15+0.12+0.10)/3 = 0.123

EXAM 5 SPRING 2014 SAMPLE ANSWERS AND EXAMINER'S REPORT

Part b: 1 point

Sample 1:

Using large groups containing subject experience for rate indications makes sense, so long as the state data does not represent a large portion of CW loss cost so that there is some independence in complement. Also CW data is usually available, easy to compute

Sample 2:

Two qualities to assess approach by:

- A. Independence from base statistic – depending on how large the state is by volume of business compared to CW it may be mostly independent, but not completely independent as CW includes the state.
- B. Bias – If state loss costs are systematically different from CW then this complement of credibility is biased as the CW complement will not reflect this systematic difference.

Sample 3:

One criterion is availability of complement data. Using countrywide loss costs would meet this since it seems we have this data. Another criterion is easy to compute. Again using countrywide loss costs are a fairly easy metric to compute compared to some other complements like Harwayne's method. This meets this criterion.

Sample 4:

Should confirm complement is easy to compute and statistically independent.

- 1. Ease of computation makes it easier to explain to a regulator, who has final approval on a rate change. Also a complement that is easy to compute will cost the company less.
- 2. It should be statistically independent from the data used to calculate the rate change so as not to distort the indication.
- Using company countrywide loss costs satisfies 1 above (assuming company has the ability to obtain countrywide data easily) but not 2 (since the countrywide data would also include this state). I would remove this state from the countrywide data and then calculate the complement.

Sample 5:

A credibility complement should be unbiased: CW may be biased compared to the state, but can be adjusted if the direction and amount is known. Acceptable.

Should have logical relationship to the loss data. CW is logical as it is the same line of business and company, just for more regions than the state. Acceptable.

EXAM 5 SPRING 2014 SAMPLE ANSWERS AND EXAMINER'S REPORT

EXAMINER'S REPORT:

Part a

Premium: The candidate was expected to be able to bring premiums to current rate level using the parallelogram method and to select and apply a one-step premium trend. A common error was incorrectly calculating the premium trend period.

Loss: The candidate was expected to be able to select loss development factors and develop losses to ultimate and to apply one-step trending to losses. The most common error was not taking into account changing development patterns for the 24-36 month period.

Fixed expense: The candidate was expected to make an appropriate selection for the fixed expense provision. To receive credit the candidate needed to exclude the extraordinary historical ratio caused by the new claims software. Common mistakes were omitting the justification for the selected ratio and using all historical years to calculate the provision.

Indication: The candidate was expected to calculate the rate level indication. To receive credit the candidate needed to calculate the projected loss ratio and, with the calculated fixed expense provision and the given variable expense and profit provisions, determine the indicated rate level change. A common mistake was omitting the provided ULAE provision from the calculation.

Part b

The candidate was expected to understand desirable qualities of a credibility complement and to evaluate the use of countrywide data with respect to each of the two qualities. A common mistake was correctly identifying two desirable qualities but neglecting to assess the use of countrywide data.