4. (3 points)

Given the following information:

- Annual loss trend rate = +4%.
- Rate change history:
  - +3% effective April 1, 2009.
  - +2% effective July 1, 2010.
- All policies have annual terms.
- Calendar year 2012 earned premium = $50,000.
- Accident year 2012 reported losses at December 31, 2012 = $4,200.

Percentage of Loss Reported at:	
12 months	10%
24 months	35%
36 months	65%

Selected Ultimate Loss Ratio	
Accident Year 2009	66%
Accident Year 2010	67%
Accident Year 2011	70%

Use the reported Bornhuetter-Ferguson technique to estimate ultimate losses for accident year 2012.

Exam 5 Question #4
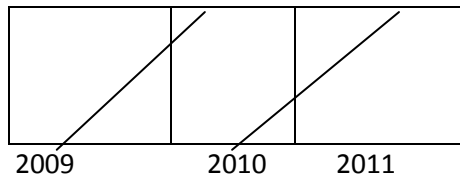
2009   2010   2011

For 2009: On-level factor: $\dfrac{1.03 \times 1.02}{9/32 \times 1.03 + 23/32 \times 1} = 1.0418$

For 2010: On-level factor: $\dfrac{1.03 \times 1.02}{\frac{1}{32} \times 1 + \frac{1}{8} \times 1.03 \times 1.02 + \frac{27}{32} \times 1.03} = 1.0184$

For 2011: On-level factor $\dfrac{1.03 \times 1.02}{\frac{1}{8} \times 1.03 + \frac{7}{8} \times 1.03 \times 1.02} = 1.00246$

Uses the average 2009-2011 ratio as the expected loss ratio

$\dfrac{1}{3}\left(66\% \times \dfrac{1.04^3}{1.0418} + 67\% \times \dfrac{1.04^2}{1.0184} + 70\% \times \dfrac{1.04}{1.00246}\right) = 71.68\%$
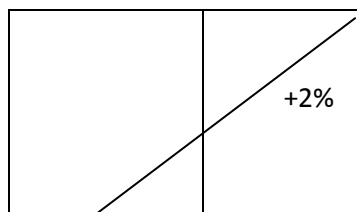
For 2012: $50{,}000 \times 71.68\% \times (1 - 10\%) + 4200 = 36456$

OR

BF ULT. Losses = 4200 + [% unrept @ 12/31/12 x LR x EP]

2011 ULT loss ratio= $\dfrac{2011\ Loss + LAE}{2011\ EP}$

2010   2011

+2%

On level factor for 2011 EP = $\dfrac{1.02}{1\ (1/8) + 1\ (7/8)} = 1.002$

2011 LR adj for 2012 = $.7\dfrac{1.04}{1.002} = .727$

BF ULT Loss for 2012 = 4200+ .727(.9) 50,000

= 36,915

b. A common error was to say the premium trend is used to bring historical premium to expected future cost level which is stating what the premium trend does but not why you'd do it. The other common mistake was to mention rate changes as part of the premium trend.

c. Candidates often compared average premium to total premium instead of historical premium to current level premium. The other common mistake was to compared written premium to earned premium instead of historical premium to current level premium.

d. Candidates scored very well on this part. When candidates missed points it was due to not responding to the actual question asked but instead describing how the issue could be addressed.

3. The question presented an analysis for a rate indication. The candidate was requested to provide 5 improvements for the analysis and briefly explain the purpose of each. Suggesting improvements to the company's operation did not address the question asked and did not receive credit.

The majority of candidates recommended and received full credit for at least four enhancements to the analysis. Many recommended and received full credit for five. Those that did not receive credit for all 5 recommendations didn't attempt an answer or suggested enhancements that did not improve the analysis. Additionally, some candidates confused various concepts (for example, "trend losses to ultimate"), provided a response that summarized prior enhancements, were too general in their recommended improvement, or simply identified a shortcoming in the analysis without offering an enhancement, and did not receive credit.

Candidates generally struggled to receive credit for briefly explaining the purpose of each recommendation; most candidates received less than full credit on four of the five explanations requested.   Most candidates did not provide an explanation or attempted to give further explanation of the enhancement without explaining its purpose -- these did not receive credit. Many candidates restated a version of the original recommended improvement to the analysis in their explanation of the purpose (i.e. "Earned premium can be adjusted to the current rate level. This makes sure that all premiums are on-level."), which did not get credit for explaining the purpose of the bringing the premium to current rate levels.

4. Many candidates did not identify the need to adjust historical loss ratios for the future 2012 level. Some did not develop on-level-factors or apply them appropriately to the historical loss ratios, while others did not apply loss trend to the historical loss ratios. Some thought that the 2012 on-level earned premium was the only on-level adjustment needed, but this number was provided and the historical loss ratios still need adjustment for future levels. We also frequently saw misidentified loss trend periods (2 years instead of 3, 1.5 years instead of 1, etc.).

5. In general, this question was completed well although there were a couple common errors on this question.