18. (1.5 points)

Given the following data:

Calendar / Accident Year	Earned Premium ($000s)
2011	100
2012	150
2013	150
2014	200

Reported Claims ($000s)

Calendar / Accident Year	12 Months	24 Months	36 Months	48 Months
2011	26	40	48	51
2012	40	43	51	
2013	44	67		
2014	69			

- The a priori expected claim ratio for all accident years is 51%.
- There is no development after 48 months.

a. (1 point)

Calculate ultimate claims for accident year 2014 using the reported Bornhuetter-Ferguson technique. Justify all selections.

b. (0.5 point)

Discuss the applicability of the Bornhuetter-Ferguson technique when cumulative claim development factors are less than 1.00.

CONTINUED ON NEXT PAGE

QUESTION 18

TOTAL POINT VALUE: 1.5 | **LEARNING OBJECTIVE: B3**

SAMPLE ANSWERS

Part a: 1 point

Sample Answer 1

AY	12-24	24-36	36-48
2011	1.538	1.200	1.063
2012	1.075	1.186	
2013	1.523		

Justification

12-24	This factor looks very weird, going to assume abnormal and exclude
24-36	Straight average, 2yr data, can't tell anything

Selection	1.531	1.193	1.063
CDF	1.941	1.268	1.063

Ultimate 118,450 = 69,000 + .51 * 200,000 * (1 - 1/1.941)

Sample Answer 2

AY	12-24	24-36	36-48
2011	1.538	1.200	1.063
2012	1.075	1.186	
2013	1.523		

Justification

12-24	I don't like the way that AY12's 12-24 month LDF is so much smaller than the other two, but removing it would be throwing out 1/3 of a small data set. So I selected a straight average.
24-36	[none]

Selection	1.379	1.193	1.063
CDF	1.748	1.268	1.063

Ultimate 112,600 = 69,000 + .51 * 200,000 * (1 - 1/1.748)

Sample Answer 3

AY	12-24	24-36	36-48
2011	1.538	1.200	1.063
2012	1.075	1.186	
2013	1.523		

Justification

12-24 Excluding AY 2012 due to what appears to be an odd anomaly in the data. Very low reported losses compared to what we'd expect and low LDFs.

24-36 [implied from above exclusion]

Selection	1.531	1.200	1.063
CDF	1.952	1.276	1.063

Ultimate 118,720 = 69,000 + .51 * 200,000 * (1 - 1/1.951)

Part b: 0.5 point

Sample Answer 1

The BF Method can be thought of as a credibility weighting between the loss development method and expected claims method. When we have a CDF < 1 we obtain a value of Z = 1/CDF >1. This is unacceptable in theory. In practice it is common to limit LDFs to one and use the BF method.

Sample Answer 2

The BF technique is a credibility weighted average of the development technique and expected claims technique. If CDFs < 1 then the % Reported >1 which violates the first rule of credibility. You can still use the method as is, limit your CDFs to 1 or use a different method.

Sample Answer 3

It still can be applicable if you cap the CDFs at 1. Although less common and less intuitive you could use the BF method as is you would just have weird % reported and % paid. Another option is to use another method.

EXAMINER'S REPORT

Part a

The candidate was expected to know how to calculate ultimate losses using the BF method given a reported loss triangle, the earned premium for the year, and an expected loss ratio. The candidate was also asked to justify all selections, which in the context of this question, applies mainly to their selection of LDFs at each age.

To obtain full credit, candidates were expected to do the following:

- Calculate the loss development factor triangle
- Provide some reasonable justification for their LDF selections
- Calculate the CDF
- Apply the CDF using the BF method to calculate ultimate loss

The most common mistake candidates made was in their justification, either by just restating the method used or by omitting any kind of justification. Credit was given for a wide variety of answers as long as the justification supported the selection.

In general, candidates performed very well on this part of the question.

Part b

The majority of the candidates who answered this question performed well. The most common answer was discussing how the credibility weight interpretation of the BF method was no longer applicable and how this should be handled. Candidates could argue the BF method was no longer applicable, was applicable as is, or was applicable with adjustments provided the response was well supported.

A common mistake was mentioning that because LDFs <1 cause negative IBNR the BF method should not be used. This is not unique to the BF method and further discussion was needed for full credit.