24. (3 points)

Given the following information:

Accident	Cumulative Reported Claims ($) as of (months)			
Year	12	24	36	48
2011	450	650	730	750
2012	500	700	780	
2013	500	750		
2014	700			

Accident Year	Selected Ultimate Claims ($)	Reported Claims ($) as of December 31, 2015
2011	750	750
2012	1,000	950
2013	1,050	900
2014	1,200	950

- There is no development after 48 months.

a. (1.5 points)

Compare actual reported claim emergence to expected reported claim emergence in calendar year 2015 for accident years 2011 through 2014.

b. (1.5 points)

When considering actual emergence compared to expected emergence, the actuary can react in one of three ways:

i. Reduce the recommended unpaid claims
ii. Leave the recommended unpaid claims at the same expected level
iii. Increase the recommended unpaid claims

Identify and briefly justify a reserving technique that would generate each of the three potential reactions using the results of part a. above.

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QUESTION 24

TOTAL POINT VALUE: 3 | **LEARNING OBJECTIVE(S): B8**

SAMPLE ANSWERS

Part a: 1.5 points

AY	12-24	24-36	36-48	48-Ult
2011	1.44	1.12	1.03	
2012	1.40	1.11		
2013	1.50			
All year avg.	1.45	1.12	1.03	1.00
Age-to-ult.	1.66	1.15	1.03	1.00

	(1)	(2)	(3)	(4)
AY	IBNR	Age-to-Ult @ 12/31/2014	Age-to-Ult @ 12/31/2015	2015 Expected Emergence
2011	0	1.00	1.00	0
2012	1000-780=220	1.03	1.00	220.00
2013	1050-750=300	1.15	1.03	238.43
2014	1200-700=500	1.66	1.15	337.26
Total				795.69

$$\%\ \text{Reported} = \frac{1}{\text{Age-to-Ult}}$$

$$(4) = \text{IBNR} \times \frac{\%\ \text{Reported 2014 - \% Reported 2015}}{\text{1-\% Reported 2015}}$$

	(5)	(6)	(7)
AY	Actual Emergence	Expected Emergence	Difference
2011	0	0.00	0
2012	950-780=170	220.00	-50
2013	900-750=150	238.43	-88
2014	950-700=250	337.26	-87
Total			-226

In all the years, actual emergence came in below expected emergence. The total difference between them for 2011-2014 is expected is 226 higher than actual emergence in CY 2015.

Part b: 1.5 points

i. The reported development technique would reduce unpaid claims because it will apply the development factors to the lower-than-expected actual reported claims amount as of 12/31/2015.

ii. The Bornhuetter-Ferguson technique will leave unpaid claims unchanged since it continues to project future claims according to the a priori expected claims ratio.

iii. The expected claims technique will increase the unpaid claims because it assumes that the ultimate claims will not change. If actual emergence is low, then it just means actual emergence will be higher in future periods.

EXAMINER'S REPORT

This was a challenging question that tasks candidates with a topic that is of great concern to regulators and public policymakers. The actuary has a duty to ensure the financial soundness of the various entities that relies upon his work. When estimated claims deviate from actual, additional analysis is required.

Candidates performed very poorly on this question.

Part a

Candidates were expected to know either the formula or understand how to derive it. Intuitively, the formula takes the ratio of the percent of claims expected to be reported (i.e., emerge) in the upcoming calendar year divided by the percent of claims expected to reported in all future calendar years.

The question provided 3 elements of data:

- A development triangle of reported claims (in dollars)
- A column labeled "Selected Ultimate claims"
- A column labeled "Reported Claims ($) as of December 31, 2015"

A common mistake was to divide the reported claims in the latest diagonal with the "Selected Ultimate Claims" and use this as the percent reported. The question does not provide any detail on how these "Selected Ultimate Claims" values are derived, so there is no indication that dividing the latest diagonal by them will provide a meaningful number. This would only be true if the ultimate claims were selected based on the reported claim development method, which was not indicated in the question. Additionally, a simple division like this would use only each individual accident year in calculating its own percent reported. This approach results in far less credibility in the estimation as all the data off the diagonal is ignored. On the other hand, Friedland's example of this scenario uses the reported development technique to calculate age-to-age factors and age-to-ultimate factors, which in turn are used to determine the percent reported values.

In this context, "Selected Ultimate Claims" can be used only as a pre-conceived expected ultimate or a priori ultimate, used only for the calculation of IBNR and an a priori complement to credibility.

Other common mistakes included:

- Comparing the IBNR to amount reported in 2015.
- Using CY 2015 in the calculation of the expected reported.
- Using the inverse of the age-to-age factor, not the inverse of the age-to-ultimate factor.
- Incorrectly calculating IBNR (e.g., subtracted the amount reported in 2015 as the total IBNR)
- Calculating the percent of IBNR to emerge (e.g., subtracting the 2015 reported from the 2014 reported, but not dividing by percent unreported).
- Neglecting to compare actual and expected

Part b

Candidates were expected not only to identify actuarial methods, but also to evaluate if the method would produce the desired result. Candidates were required to state whether actual

development or expected development was higher, state a valid method for each sub-part, and provide a valid justification.

For part i., when, as in the problem, expected emergence is higher than actual, favorable development is occurring. Candidates were expected to identify a technique where the historical pattern of favorable development is used. The paid or reported development technique are ideal answers. These techniques do not use any complement of credibility or expected amount—100% of the historical data is used in the estimation of the unpaid amounts. As the current emergence is lower than expected, this will result in lower than expected future emergence, thus, lower than expected unpaid claims.

For part ii., the ideal method is the Bornhuetter-Ferguson method. The key property with Bornhuetter-Ferguson is that it provides weight to both the historical pattern and an expected ultimate. When the percent reported is used as the weight—as is typical—this results in the unpaid amount being the same regardless of the reporting pattern.

For part iii., candidates were expected to identify a technique where unpaid amounts would be higher given the amount already reported. The Expected Claims Technique is the ideal answer as it presumes that any development deviation will be undone and the claims will ultimately settle for the expected amount.

Part a. of this question provided a reported development pattern and part b. asked for a recommendation to adjust unpaid claims. However, the intention of part a. was identify whether emergence was more or less than expected. Many candidates implicitly assumed that the lower-than-expected reported emergence translated to lower-than-expected paid emergence. Candidates working under a different assumption who answered appropriately given their stated assumption were also awarded credit.

Some candidates attempted to name a technique that would result in all three scenarios, rather than one technique for each scenario.

Part b. specifically asks for a reserving technique. Reserving techniques are items such as Paid/Reported Development, Expected Claims Method, Bornhuetter-Ferguson, Cape Cod, Berquist-Sherman, etc. Many candidates responded with proposed adjustments to data rather than reserving techniques, with responses such as, "adjust the expected ultimate downward" or "assume that a large loss remains unpaid." These responses are incorrect as they do not propose and support the proposal of a reserving technique.