24. (2.5 points)

Given the following data:

Accident Year	Paid Claims ($000) as of (months)			
	12	24	36	48
2013	1,100	1,650	1,815	1,815
2014	1,210	1,820	2,005	
2015	1,335	2,005		
2016	1,470			

Accident Year	Reported Claims ($000) as of (months)			
	12	24	36	48
2013	1,540	1,980	1,888	1,815
2014	1,694	2,184	2,060	
2015	1,869	2,306		
2016	1,911			

Accident Year	Closed Claim Counts as of (months)			
	12	24	36	48
2013	550	825	908	908
2014	578	867	954	
2015	605	908		
2016	635			

Accident Year	Open Claim Counts as of (months)			
	12	24	36	48
2013	165	83	18	0
2014	173	87	19	
2015	181	91		
2016	191			

Accident Year	Paid Claims to Reported Claims Ratio as of (months)			
	12	24	36	48
2013	71.4%	83.3%	96.2%	100.0%
2014	71.4%	83.3%	97.1%	
2015	71.4%	87.0%		
2016	76.9%			

Accident Year	Closed to Reported Counts Ratio as of (months)			
	12	24	36	48
2013	76.9%	90.9%	98.1%	100.0%
2014	77.0%	90.9%	98.0%	
2015	77.0%	90.9%		
2016	76.9%			

Accident Year	Average Paid Claim Severity ($) as of (months)			
	12	24	36	48
2013	2,000	2,000	1,999	1,999
2014	2,093	2,099	2,096	
2015	2,207	2,208		
2016	2,315			

Accident Year	Average Case Outstanding ($) as of (months)			
	12	24	36	48
2013	2,667	3,976	4,033	0
2014	2,798	4,184	3,158	
2015	2,950	3,305		
2016	2,309			

- There are no partial payments.
- There is no development after 48 months.

a. (2 points)

Estimate the accident year 2016 IBNR using the Berquist Sherman case outstanding adjustment.

b. (0.5 point)

Propose and briefly justify another appropriate technique for developing the accident year 2016 IBNR.

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QUESTION 24

TOTAL POINT VALUE: 2.5 | **LEARNING OBJECTIVE(S): B5**

SAMPLE ANSWERS

Part a: 2 points

Sample 1

Paid Severity Trend

AY	12	24	36
13	4.65%	4.95%	4.85%
14	5.40%	5.20%	
15	4.90%		

Select a judgmental 5% paid severity trend

Adjusted Avg Case O/S

AY	12	24	36	48
13	1995	2998	3008	0
14	2094	3148	3158	
15	2199	3305		
16	2309			

Adjusted Reported

AY	12	24	36	48
13	1995(165)+1100 = 1429	1899	1869	1815
14	1572	2094	2060	
15	1733	2306		
16	1911			

Weighted Avg	12-24	24-36	36-48
LDF	1.330	0.984	0.971

AY 16 Ult = 2,428,000, IBNR = 517,000

Sample 2

Average Paid Severity

		% chg	
AY	12	24	36
13-14	4.7%	5.0%	4.8%
14-15	5.5%	5.2%	
15-16	4.9%		

Average Case Outstanding

		% chg	
AY	12	24	36
13-14	4.9%	5.2%	-21.6%
14-15	5.4%	-21.1%	
15-16	-21.7%		

There is a decrease in average reserve adequacy. I will choose a sev trend of 5% = (4.65% + 5.45% + 4.89%) / 3 to do the adjustment.

Adj Avg Case Outstanding

AY	12	24	36	48
13	1994	2997	3007	0
14	2094	3148	3158	
15	2199	3305		
16	2309			

Adj Case Outstanding = Avg Case Outstanding x Open Claims

AY	12	24	36	48
13	329109	248812	54137	0
14	362319	273843	60002	
15	398028	300755		
16	441019			

Adj Reported Claims = Adj Case Outstanding + Paid Claims (in $1,000,000)

AY	12	24	36	48
13	1.43	1.90	1.87	1.82
14	1.57	2.09	2.06	
15	1.73	2.31		
16	1.91			

	12-24	24-36	36-48	48-Ult
	1.33	0.984	0.973	1
	1.33	0.990		
	1.34			
LDF	1.33	0.987	0.973	1
CDF	1.28			

Ult AY 2016 Claims = 1.28 x 1911K = 2446K
AY 2016 IBNR = 2446K - 1911K = 535K

Part b: 0.5 point

Any one of the following:

- Since the paid development technique is not affected by case reserve changes and the development factors here seem stable, this technique would be appropriate.
- Freq-Sev on Paid data. Paid severity increased at steady 5% per year, close/reported count ratio fairly steady at all maturities.
- You can use ECR method. As long as the underlying ratio has not changed, this will project an accurate IBNR as it is unaffected by changes in case reserve adequacy.

EXAMINER'S REPORT

Candidates were expected to be able to carry out the Berquist-Sherman adjustment, calculate the ultimate losses, and then calculate IBNR. Candidates were also expected to be able to use the provided triangles in order to propose and justify another methodology that could be used appropriately on the data.

Part a

Candidates were expected to evaluate severity and/or average case outstanding trends, use trends to calculate the adjusted average case outstanding, calculate the adjusted reported triangle, and then apply the reported development technique to calculate 2016 IBNR.

Common errors included:

- Reviewing trends in total claims rather than average severity or average case outstanding
- Ignoring trends altogether or trending in the wrong direction
- Applying trend factors to actual average case outstanding instead of a single diagonal

- Treating the adjusted average case outstanding as if it was the total case outstanding
- Attempting to develop adjusted case or average case to ultimate
- Using average case outstanding values as if they were in $000s
- Calculation errors in part of a triangle
- Only calculating Ultimate losses and not IBNR

Part b

Candidates were expected to provide an appropriate method and briefly justify its appropriateness in the presence of changing case reserves. Candidates were expected to be able to properly distinguish between a case reserve change and settlement rate change and how these would affect the diagnostic triangles.

Common errors included:

- Not including a justification
- Attempting to diagnose a change in settlement rates
- Explanations that do not justify the technique's appropriateness in the presence of a case reserve change. For example, choosing the Bornhuetter-Ferguson method on paid data due to highly leveraged development factors.
- Suggesting that the paid to reported ratio for 2016 shows a change in settlement rates and proposing a method that works well with settlement rate changes.
- Confusing the difference between a (frequency or severity) trend, changes in claim experience, and a change in practice. Candidates proposed methods that work well when there are changes in trends or experience rather than when case reserves are changing.