22. (3 points)

An actuary working at an insurance company is using a frequency-severity technique to estimate ultimate claims. The company made an effort to close claims more quickly starting in 2014. Given the following information:

Closed Claim Counts as of (months)

Accident Year	12	24	36	48
2012	435	600	670	705
2013	520	700	740	
2014	600	650		
2015	620			

Paid Claims ($000s) as of (months)

Accident Year	12	24	36	48
2012	393	650	765	776
2013	511	697	744	
2014	637	825		
2015	722			

Reported Claim Counts as of (months)

Accident Year	12	24	36	48
2012	600	670	720	730
2013	640	715	750	
2014	620	690		
2015	650			

Reported Claims ($000s) as of (months)

Accident Year	12	24	36	48
2012	560	720	780	790
2013	580	720	760	
2014	670	850		
2015	760			

- 48-Ultimate reported claim count factor = 1.03.
- 48-Ultimate closed claim count factor = 1.06.
- 48-Ultimate paid severity factor = 1.15.
- 48-Ultimate reported severity factor = 1.02.

a. (0.5 point)

Determine whether evidence exists to support that claims are closing more quickly starting in 2014.

b. (2.5 points)

Calculate an appropriate frequency-severity estimate of ultimate claims for accident years 2014 and 2015.

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QUESTION 22

TOTAL POINT VALUE: 3 | **LEARNING OBJECTIVE: B3, B5**

SAMPLE ANSWERS

Part a: 0.5 point

Sample Answer 1

Paid to Rpt Triangle

AY	12	24	36	48
12	0.70	0.903	0.981	0.982
13	0.88	0.968	0.979	
14	0.951	0.971		
15	0.95			

Increase in CY 14 & 15 closed claims (last 2 diagonals). This matches company's effort.

Sample Answer 2

Closed/Reported

	12	24	36	48
12	.725	.896	.931	.97
13	.8125	.979	.987	
14	.97	.942		
15	.954			

Closed to Reported Ratio is increasing clearly showing an increase in the claims closing rate.

Sample Answer 3

Reported CC Age-Age

AY	12-24	24-36	36-48	Tail
12	1.117	1.075	1.014	
13	1.117	1.049		
14	1.113			
Avg.	1.116	1.062	1.014	1.03
CDF	1.238	1.109	1.044	1.03

AY	Rept. CC Ults
12	752
13	783
14	765
15	650(1.238)=805

Disp. Rates = closed counts/ult. cc

AY	12	24	36	48
12	.578	.798	.891	.938
13	.664	.894	.945	
14	.784	.850		
15	.770			

There is enough evidence to support that claims are closing more quickly starting 2014. Starting in 2014 and 2015, the disp. rates are much higher than the CY 2012 and 2013 disp. rates.

Part b: 2.5 points

Sample Answer 1

Since the rate of payment is increasing, I will use reported data to mitigate the effect of this change.

Reported counts

AY	12-24	24-36	36-48	48-Ult
2012	1.117	1.075	1.014	
2013	1.117	1.045		
2014	1.113			
Selected	1.116	1.062	1.014	1.03

All-year average used since factors are similar.

Reported Severity

AY	12	24	36	48
2012	0.933	1.075	1.083	1.082
2013	0.906	1.007	1.013	
2014	1.081	1.232		
2015	1.169			

Reported Severity Age-Age

AY	12-24	24-36	36-48	48-Ult.
2012	1.152	1.007	0.999	
2013	1.111	1.006		
2014	1.140			
Selected	1.139	1.007	0.999	1.02

All-year average used since factors are similar

AY 2014 Ult. Count = 690*1.067*1.014*1.03
= 765
Ult, Sev. = 1.232*1.007*.999*1.02
= 1.264
Ult. Claims = 967,000

AY 2015 Ult. Count = 650*1.116*1.062*1.014*1.03
= 805
Ult, Sev. = 1.169*1.134*1.007*.999*1.02
= 1.36
Ult. Claims = 1,095,000

Sample Answer 2

Since there is a change in settlement pattern, use reported claims data to avoid distortion.
Use weighted average to calculate A-A factor

Reported claim counts

	12-24	24-36	36-48	48-Ult.
A-A	1.116	1.061	1.014	1.03
A-U	1.237	1.108	1.014	1.03

AY 2014 690*1.108 = 765
2015 650*1.237 = 804

Reported Severity

AY	12	24	36	48
12	933	1075	1083	1082
13	906	1007	1013	
14	1081	1232		
15	1169			
	12-24	24-36	36-48	48-Ult
A-A	1.1349	1.0067	0.999	1.02
A-U	1.1642	1.0258		

AY 2014 Ult claims : 765*1232*1.0258 = 966,796
2015 Ult claims : 804*1169*1.1642 = 1,094,203

EXAMINER'S REPORT

Part a

Candidates were expected to use the available data to create one of three triangles that can provide evidence of increased claim closure rates and accurately interpret the triangle created in reference to the question posed. Candidates were then expected to provide data, point out the relevant trend in the data, and state that this trend does indicate a speed up in claim closure rates. Finally, candidates were expected to give accurate descriptions of an increasing trend in claim closure rates or a large increase in calendar year 2014.

Common mistakes included:

- Using paid claim count Age-to-Age factor triangles to show an increase in claim closure rate when that data only shows a slowdown in claim closure rates for periods after 12 months.
- Misinterpreting AY 2014 12-24 month data as CY 2014. Many candidates cited the decrease in the paid to reported ratios at 24 months from AY 2013 to AY 2014 as evidence that no speed up occurred, when the increase in the ratio at 24 months from AY 2012 to AY 2013 is the relevant comparison from that column.

Part b

Candidates were expected to recognize that the change in claim closure rate requires the use of reported rather than paid/closed data in the frequency-severity estimate. Candidates were then expected to use separate frequency and severity triangles to develop LDFs, CDFs, and estimates for ultimate claim count and severity, then finally combine the ultimate frequency and severity to produce an estimate of ultimate claims.

Common mistakes included:

- Using paid severity and/or closed claim counts to estimate ultimate severity and claim counts. This is not appropriate where claim closure rates are changing.
- Using a disposal rate method that involved calculating incremental severity. This approach assumes no partial payments in the paid claims data.