24. (3.25 points)

Given the following data as of December 31, 2014:

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

Accident Year	12	24	36	48
2011	1,000	1,100	1,157	1,178
2012	1,500	1,650	1,733	
2013	2,000	2,200		
2014	2,500			

Paid ALAE ($000) as of (months)

Accident Year	12	24	36	48
2011	100	220	347	424
2012	150	330	520	
2013	200	440		
2014	375			

Accident Year	Selected Ultimate Claims Only ($000)
2011	1,178
2012	1,768
2013	2,356
2014	2,945

- Assume that no development occurs after 48 months.

a. (1.5 points)

Calculate ultimate ALAE using the multiplicative development technique applied to the ratio of paid ALAE-to-paid claims only for accident years 2012, 2013, and 2014.

b. (1.25 points)

Calculate ultimate ALAE using the additive alternative approach to the technique in part a. above for accident years 2012, 2013, and 2014.

c. (0.5 point)

Select and justify a reasonable estimate of ultimate ALAE for accident year 2014 based on the estimates calculated in parts a. and b. above.

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EXAM 5 SAMPLE ANSWERS AND EXAMINER'S REPORT

SAMPLE ANSWERS

Part a: 1.5 points

Sample Answer 1

Paid ALAE to Paid Loss Ratios (Paid ALAE / Paid Loss)
AY 12 24 36 48
2011 10.0% 20.0% 30.0% 36.0%
2012 10.0% 20.0% 30.0%
2013 10.0% 20.0%
2014 15.0%

Paid ALAE to Paid Loss Age-to-Age Factors
AY 12-24 24-36 36-48
2011 2.0 1.5 1.2
2012 2.0 1.5
2013 2.0

12 24 36 48
ATA: 2.0 1.5 1.2 1.0
ATU: 3.6 1.8 1.2 1.0

Estimated Ultimate ALAE/Loss Ratio
2012: 30.0% * 1.2 = 36.0%
2013: 20.0% * 1.8 = 36.0%
2014: 15.0% * 3.6 = 54.0%

Estimated Ultimate ALAE
2012: 1,768 * 36.0% = 636.50
2013: 2,356 * 36.0% = 848.20
2014: 2,945 * 54.0% = 1590.30

Sample Answer 2

Paid ALAE to Paid Loss Ratios (Paid ALAE / Paid Loss)
AY 12 24 36 48
2011 10.0% 20.0% 30.0% 36.0%
2012 10.0% 20.0% 30.0%
2013 10.0% 20.0%
2014 15.0%

Paid ALAE to Paid Loss Age-to-Age Factors
AY 12-24 24-36 36-48
2011 2.0 1.5 1.2
2012 2.0 1.5
2013 2.0

12 24 36 48 ATA: 2.0 1.5 1.2 1.0 ATU: 3.6 1.8 1.2 1.0 Estimated Ultimate ALAE/Loss Ratio 2012: 30.0% * 1.2 = 36.0% 2013: 20.0% * 1.8 = 36.0% 2014: 15.0% * 3.6 = 54.0% Since AY 14 ultimate ratio is much higher than historical, I will judgmentally select a more reasonable estimate of 36%. I assume 2014 is an outlier. Estimated Ultimate ALAE 2012: 1,768 * 36.0% = 636 2013: 2,356 * 36.0% = 848 2014: 2,945 * 36.0% = 1060
Part b: 1.25 points
Sample Answer 1 Additive Age-to-Age of ALAE to paid ratios AY 12-24 24-36 36-48 2011 10.0 10.0 6.0 2012 10.0 10.0 2013 10.0 12 24 36 48 ATA: 10.0 10.0 6.0 0.0 ATU: 20.6 10.6 6.0 0.0 Estimated Ultimate ALAE Ratio 2012: 30.0% + 6.0% = 36.0% 2013: 20.0% + 16.0% = 36.0% 2014: 15.0% +26.0% = 41.0% Estimated Ultimate ALAE 2012: 1,768 * 36.0% = 636.50 2013: 2,356 * 36.0% = 848.20 2014: 2,945 * 41.0% = 1,207.50 *Sample Answer 2* Additive Age-to-Age of ALAE to paid ratios

AY 12-24 24-36 36-48
2011 10.0 10.0 6.0
2012 10.0 10.0
2013 10.0

12 24 36 48
ATA: 10.0 10.0 6.0 0.0
ATU: 20.6 10.6 6.0 0.0

Estimated Ultimate ALAE Ratio
2012: 30.0% + 6.0% = 36.0%
2013: 20.0% + 16.0% = 36.0%
2014: 15.0% +26.0% = 41.0%
Since AY 14 ultimate ratio is much higher than historical, I will judgmentally select a more reasonable estimate of 36%. I assume 2014 is an outlier.

Estimated Ultimate ALAE
2012: 1,768 * 36.0% = 636
2013: 2,356 * 36.0% = 848
2014: 2,945 * 36.0% = 1,060

Part c: 0.5 point

Sample Answer 1

Select estimate of 1,207,450 based on additive approach. CDF for AY 14 in multiplicative approach (3.6) is highly leveraged. Additive estimate is more stable at earlier maturities.

Sample Answer 2

If the change [in AY 14's paid to paid ratio relative to historical ratios] is not due to changes in our claims settlement rate, the multiplicative approach will be more responsive. Thus, I will select answer a: 1,590,300 for AY 2014.

Sample Answer 3

Since 2014 has a high ratio at 12 months (15% compared to 10% all other years) and is immature, select the stable ALAE/claims ratio of 36% that 2012-2013 have in part b. 2014 ultimate ALAE = .36 * 2,945 = 1,060.

Sample Answer 4

I would select [the ALAE ratio of 36% for AY 14] by treating the spike in most recent paid to paids

as noise given its inconsistency with prior years.

Sample Answer 5

Select ALAE that would result from using an ALAE to loss ratio of (.54 + .36)/2 to balance responsiveness and stability.

EXAMINER'S REPORT

Part a

The candidate was expected to know how to use paid ALAE and paid loss triangles to calculate paid ALAE to paid loss ratio triangles.

The candidate was expected to know how to calculate multiplicative development factors from paid ALAE to paid loss triangles and apply those factors to determine ultimate ALAE to loss ratios by accident year.

The candidate was expected to know how to apply ultimate ALAE to loss ratios to ultimate loss to determine estimates of ultimate ALAE by Accident Year.

Common errors included calculating ultimate ALAE for only AY 2014, applying ultimate ALAE/loss ratio to paid loss rather than to ultimate loss, failing to use the development data from AY 2011, and developing paid ALAE rather than the paid ALAE/paid loss ratio. In order to receive full credit for a response in which the candidate chose an ultimate ALAE/loss ratio for AY 2014 that differed from the ratio resulting from the multiplicative method, the candidate needed to provide justification for this decision.

Most candidates received full credit for part a.

Part b

The candidate is expected to know how to calculate additive development factors from paid ALAE to paid loss triangles and apply those factors to determine ultimate ALAE to loss ratios by Accident Year.

The candidate is expected to know how to apply ultimate ALAE to loss ratios to ultimate loss to determine estimates of ultimate ALAE by Accident Year.

Common errors included calculating ultimate ALAE for only AY 2014, applying ultimate ALAE/loss ratio to paid loss rather than to ultimate loss, failing to use the development data from AY 2011, developing paid ALAE rather than the paid ALAE/paid loss ratio, and multiplying instead of adding the calculated ATA factors. In order to receive full credit for a response in which the candidate chose an ultimate ALAE/loss ratio for AY 2014 that differed from the ratio resulting from the additive method, the candidate needed to provide justification for this decision.

Most candidates received full credit for part b.

Part c

The candidate was expected to be able to compare the advantages and disadvantages of multiplicative and additive development techniques.

Multiple answers were accepted, and since many candidates exercised judgment when selecting ultimate ALAE/loss ratios in parts a and b, part c was graded based on consideration of the candidate's response in parts a and b.

Common errors included not stating which method the candidate selected and not appropriately and adequately justifying the selection.

Most candidates received full credit in part c.