

23. (3 points)

Given the following data as of December 31, 2016:

Accident Year	Earned Premium	Cumulative Paid Claims as of (months)			
		12	24	36	48
2013	2,000	390	875	1,135	1,265
2014	2,260	425	1,065	1,355	
2015	2,730	564	1,267		
2016	3,215	619			

- A court decision on December 31, 2014 led to a 20% increase in severity for all payments occurring after the decision.
- The company took a rate change of +20% effective on January 1, 2014.
- Policies are annual and are written evenly throughout the year.
- There is no development beyond 48 months.

a. (1.5 points)

Calculate accident year 2016 ultimate claims using the paid claim development technique, incorporating the impact of the court decision.

b. (1.5 points)

Calculate the accident year 2016 ultimate claims using the Cape Cod technique, incorporating the impact of the court decision.

EXAM 5 SPRING 2017 SAMPLE ANSWERS AND EXAMINER'S REPORT

QUESTION 23				
TOTAL POINT VALUE: 3			LEARNING OBJECTIVE(S): B5	
SAMPLE ANSWERS				
Part a: 1.5 points				
Adjust the paid claims before 12/31/2014				
Incremental Paid Claims				
AY	12	24	36	48
2013	390	485	260	130
2014	425	640	290	
2015	564	703		
2016	619			
Adjusted				
AY	12	24	36	48
2013	468	582	260	130
2014	510	640	290	
2015	564	703		
2016	619			
Adjusted Cumulative Paid Claims				
AY	12	24	36	48
2013	468	1050	1310	1440
2014	510	1150	1440	
2015	564	1267		
2016	619			
Development Factor				
AY		12-24	24-36	36-48
2013		2.24	1.25	1.10
2014		2.25	1.25	
2015		2.25		
Select:		2.25	1.25	1.10
Ultimate claims for AY 2016: $619 \times 2.25 \times 1.25 \times 1.10 = 1,915$				
Part b: 1.5 points				
Sample 1:				
AY	EP	On-level Factor	Used up on-level EP	Paid Claims
2013	2,000	1.2		1,440
2014	2,260	1.091		1,440
2015	2,730	1	$2,000 \times 1.2 \times 1 = 2,400$ $2,260 \times 1.091 \times (\frac{1}{1.1}) = 2,242$	1,267
2016	3,215	1	$2,730 \times 1 \times (\frac{1}{1.1 \times 1.25}) = 1,985$ $3,215 \times 1 \times (\frac{1}{1.1 \times 1.25 \times 2.25}) = 1,039$	619
		$\frac{1.2}{(1+1.2)/2} = 1.091$	7,666	4,766

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Cape Cod technique loss ratio: $4,766 / 7,666 = 62.2\%$

AY 2016 Ultimate Claims: $619 + 3215 \times 62.2\% \times \left(1 - \frac{1}{2.25 \times 1.25 \times 1.1}\right) = 1,972$

Sample 2:

AY	EP	OL factor	OLEP	Adj. Paid	CDF	Ult. Loss
2013	2,000	1.2	2400	1440	1	1440
2014	2,260	1.09	2465	1440	1.1	1584
2015	2,730	1	2730	1267	1.38	1742
2016	3,215	1	3215	619	3.09	1915
Total			10810			6681

Expected Loss Ratio: $= 6681/10810 = 61.8\%$

Cape Cod AY 2016 Ult. $= 619 + 3215 \times 0.618 \times (1 - 1/3.09)$
 $= 1,964$

EXAMINER'S REPORT

Candidates were expected to know the mechanics and assumptions associated with the paid loss development method and Cape Cod technique. Candidates were expected to adjust the loss triangle for a legal change and to on-level premium for a rate change.

Part a

Candidates were expected to know the mechanics and assumptions associated with the paid loss development method.

Common errors included:

- Not adjusting the triangle for the law change.
- Adjusting the triangle for payments occurring after December 31, 2014. These payments were made after the law change and already at the higher severity level.
- Adjusting the triangle to reflect the higher severity in the 2013 and 2014 diagonals, but not carrying this adjustment to the 2015 and 2016 diagonals for accident years 2013 and 2014. For example, the incremental portion of the cumulative payments for accident year 2015 at 36 months that were made in 2013 and 2014 needed to be increased to account for the higher severity.
- Ignoring the 2013-to-2014 and 2014-to-2015 diagonals when selecting LDFs to only use data post-law change. The question specifically asks for the impact of the court decision to be included, and one diagonal of data is not sufficient to incorporate the impact.

Part b

EXAM 5 SPRING 2017 SAMPLE ANSWERS AND EXAMINER'S REPORT

Candidates were expected to know the mechanics and assumptions associated with Cape Cod method.

Common errors included:

- Incorrectly calculating on-level factor. For example, calculating the correct average rate factor (1.1) for AY 2014 but not adjusting the rate to the current level. The correct on level factor is $1.2/1.1 = 1.09$.
- Not using court decision adjusted paid losses for the loss ratio calculation.
- Selecting an expected loss ratio rather than using aggregated losses and used up premium for the Cape Cod loss ratio calculation.
- Using the incorrect formula for the ultimate loss calculation.