

EXAM 5, FALL 2014

21. (2 points)

Given the following information for an insurance company:

Accident	<u>Gross Cumulative Reported Claims (\$000)</u>			
<u>Year</u>	<u>12 Months</u>	<u>24 Months</u>	<u>36 Months</u>	<u>48 Months</u>
2010	3,500	8,120	12,180	14,616
2011	3,000	6,840	10,465	
2012	3,300	7,656		
2013	3,250			

Accident	<u>Net Cumulative Reported Claims (\$000)</u>			
<u>Year</u>	<u>12 Months</u>	<u>24 Months</u>	<u>36 Months</u>	<u>48 Months</u>
2010	2,275	5,278	7,917	9,500
2011	2,100	4,788	7,326	
2012	2,475	5,742		
2013	2,600			

- Assume no further development after 48 months.

a. (0.5 point)

Using the data, determine the structure of the company's reinsurance program.

b. (1.5 points)

Estimate the ceded IBNR for accident year 2013.

CONTINUED ON NEXT PAGE

**EXAM 5 FALL 2014 SAMPLE ANSWERS AND EXAMINER'S REPORT**

**QUESTION 21**

**TOTAL POINT VALUE: 2**

**LEARNING OBJECTIVE: B6**

**SAMPLE ANSWERS**

**Part a: 0.5 point**

Accepted Answer 1

Accident Year	<u>Net to Gross triangle</u>			
	<u>12 Months</u>	<u>24 Months</u>	<u>36 Months</u>	<u>48 Months</u>
2010	0.65	0.65	0.65	0.65
2011	0.7	0.7	0.7	
2012	0.75	0.75		
2013	0.8			

Since the net to gross ratios are consistent along the accident years, we know that the reinsurance structure is Quota Share.

Accepted Answer 2

2010 has 65% quota share  
 2011 has 70% quota share  
 2012 has 75% quota share  
 2013 has 80% quota share

**Part b: 1.5 points**

Accepted Answer 1

Determine the Gross IBNR, apply the QS percentage to get ceded.

<u>AY</u>	<u>12-24 Months</u>	<u>24-36 Months</u>	<u>36-48 Months</u>
2010	2.320	1.5	1.2
2011	2.280	1.53	
2012	2.320		
Select	2.307	1.515	1.2
Age-to-Ult	4.194	1.818	1.2

Gross IBNR = 3,250,000(4.194) – 3,250,000 = 10,380,500

Net/Gross factor = .8 or Ceded factor = .2

Ceded IBNR = 10,380,500 \* (1-.8) = 2,076,100

## EXAM 5 FALL 2014 SAMPLE ANSWERS AND EXAMINER'S REPORT

### Accepted Answer 2

Determine Ceded by calculating Gross Ultimate and Net Ultimate separately.

	12-24	24-36	36-48
<u>AY</u>	<u>Months</u>	<u>Months</u>	<u>Months</u>
2010	2.320	1.5	1.2
2011	2.280	1.53	
2012	2.320		
Select	2.307	1.515	1.2
Age-to-Ult	4.194	1.818	1.2

Gross Ultimate =  $3,250,000(4.194) = 13,630,500$

Net Ultimate =  $2,600,000(4.194) = 10,904,400$

Ceded Ultimate =  $13,630,500 - 10,904,400 = 2,726,100$

Ceded IBNR =  $2,726,100 - (3,250,000 - 2,600,000) = 2,076,100$

### Accepted Answer 3

Accident	<u>Ceded Cumulative Reported Claims (\$000)</u>			
<u>Year</u>	<u>12 Months</u>	<u>24 Months</u>	<u>36 Months</u>	<u>48 Months</u>
2010	\$1,255	\$2,842	\$4,263	\$5,116
2011	\$900	\$2,052	\$3,139	
2012	\$825	\$1,914		
2013	\$650			

	12-24	24-36	36-48
<u>AY</u>	<u>Months</u>	<u>Months</u>	<u>Months</u>
2010	2.320	1.5	1.2
2011	2.280	1.53	
2012	2.320		
Select	2.307	1.515	1.2
Age-to-Ult	4.194	1.818	1.2

Ceded Ultimate =  $650,000(4.194) = 2,726,100$

Ceded IBNR =  $2,726,100 - 650,000 = 2,076,100$

### EXAMINER'S REPORT

The candidate was expected to have a basic knowledge of the chain and ladder method and have a basic knowledge of quota share reinsurance.

Overall, candidates did very well on this question. Candidates who lost points on (a) also tended to lose points on (b).

## EXAM 5 FALL 2014 SAMPLE ANSWERS AND EXAMINER'S REPORT

### Part a

The candidate needed to show some calculation and deduce that the reinsurance structure was quota share.

Most candidates got full credit on this part. The most common error was claiming the reinsurance was excess loss because the net / gross ratios changed year over year.

### Part b

The candidate was expected to calculate and select age-ultimate factors, correctly develop ultimate claims, correctly take out paid claims (depending on the candidate's method) and keep track of gross/net/ceded claims.

Most candidates did very well on this part. The most common mistakes were:

- Not subtracting paid claims to get IBNR
- Providing net IBNR not ceded IBNR
- Applying 20% quota share to the net claim estimate, not the gross.