

24. (4 points)

A primary insurer has reported the following undiscounted experience:

Accident Year	Cumulative Net Paid Loss (\$000s) as of (months)	
	12	24
2017	200	800
2018	250	

Accident Year	Cumulative Net Ultimate Loss (\$000s) as of (months)	
	12	24
2017	1,200	1,600
2018	1,250	

- The primary insurer cedes 75% of its premiums and losses to a reinsurer under a quota share treaty. This treaty has been in place since the beginning of 2017.
- The discount factor is 0.9 for all years for both the primary insurer and the reinsurer.
- The reinsurer consistently reserves its portion of the book 20% higher than the primary insurer.
- The effective tax rate is 30% for the primary insurer and 20% for the reinsurer.

a. (3 points)

The reinsurer is looking to commute all three accident years. Calculate the commutation price at which the tax dollars paid due to the commutation would be equal for both parties.

b. (1 point)

Identify four motivations for a reinsurer to enter into a commutation.

**SAMPLE ANSWERS AND EXAMINER'S REPORT**

<b>SPRING 2019 EXAM 6US, QUESTION 24</b>		
<b>TOTAL POINT VALUE: 4</b>	<b>LEARNING OBJECTIVE: E</b>	
<b>SAMPLE ANSWERS</b>		
<b>Part a: 3 points</b>		
<u>Sample 1</u>		
<b>Net Reserves = Net Ultimate Loss less Net Paid Loss</b>		
AY	12	24
17	1000	800
18	1000	
<b>Primary Ceded Reserves = Net Reserve / 0.25 * 0.75</b>		
AY	12	24
17	3000	2400
18	3000	
<b>Reinsurer Reserves = Primary Ceded Reserves * 1.2</b>		
AY	12	24
17	3600	2880
18	3600	
<p>Reinsurer Tax = (Discounted Opinion of Reserves – Price) * Tax Rate                      Primary Insurer Tax = (Price – Discounted Opinion of Reserves) * Tax Rate</p> <p><math>(Price - 5400 * 0.9) * 0.3 = (6480 * 0.9 - Price) * 0.2</math></p> <p><math>0.3P - 1458 = 1166.4 - 0.2P</math>  <math>P = 5248.8</math></p>		
<u>Sample 2</u>		
<b>Insurer Gross Paid = Net Paid / 0.25</b>		
AY	12	24
17	800	3200
18	1000	
<b>Insurer Gross Ultimate = Net Ultimate / 0.25</b>		
AY	12	24
17	4800	6400
18	5000	
<b>Insurer Gross Reserves</b>		

**SAMPLE ANSWERS AND EXAMINER'S REPORT**

AY	12	24
17	4000	3200
18	4000	

**Insurer Ceded Reserves = Gross Reserves \* 0.75**

AY	12	24
17	3000	2400
18	3000	

**Reinsurer Assumed Reserves = Insurer Ceded Reserves \* 1.2**

AY	12	24
17	3600	2880
18	3600	

Reinsurer Tax = (Discounted Opinion of Reserves – Price) \* Tax Rate

Primary Insurer Tax = (Price – Discounted Opinion of Reserves) \* Tax Rate

$$(P - 5400 * 0.9) * .3 = (6480 * 0.9 - P) * 0.2$$

$$0.3P - 1458 = 1166.4 - 0.2P$$

$$P = 5248.8$$

Sample 3

**Ceded Paid Loss**

AY	12	24
17	600	2400
18	750	

**Ceded Ultimate Loss**

AY	12	24
17	3600	4800
18	3750	

**Ceded Reserves = Ceded Ultimate – Ceded Paid**

AY	12	24
17	3000	2400
18	3000	

$$\text{Tax paid by insurer} = [\text{Price} - (3000+2400) * 0.9] * 0.3 = 0.3\text{Price} - 1458$$

$$\text{Tax paid by reinsurer} = [(3000+2400) * 1.2 * 0.9 - \text{Price}] * 0.2 = 1166.4 - 0.2\text{Price}$$

$$0.3\text{Price} - 1458 = 1166.4 - 0.2\text{Price}$$

$$\text{Price} = 5248.$$

## SAMPLE ANSWERS AND EXAMINER'S REPORT

### Sample 4

Ceded discounted reserves =  $0.9 * [(1250 - 250) / 0.25 * 0.75 + (1600 - 800) / 0.25 * 0.75] = 4860$

Tax paid by insurer =  $0.3 * (\text{Price} - 4860)$

Tax paid by reinsurer =  $0.2 * (4860 * 1.2 - \text{Price})$

$0.5\text{Price} = 2624.4$

Price = 5248.8

### **Part b: 1 point**

Bolded sample answers indicate unique subject responses, any four of which were required. Italicized sample answers are common variations on the unique response.

- **The reinsurer may wish to exit a line of business**
  - *Exit a market segment*
  - *Exit a state/area*
  - *Exit this segment of business*
- **Concerns about the primary insurer's solvency**
  - *Concerned about the insurer's financial stability*
  - *The insurer is in financial difficulty*
- **The reinsurer may wish to end a troubled relationship with the primary insurer**
  - *To end a frayed relationship*
  - *End a troubled relationship with an insurer who may be over-reporting claims that may not be covered*
  - *The relationship with the primary insurer has deteriorated*
  - *Repeated problems with the primary insurer*
  - *Reinsurer may have significant disputes / disputed balances with underlying insurer*
- **The reinsurer has calculated a different ultimate loss than the insurer and believes it is profitable to commute**
  - *Primary insurer and reinsurer may have different ideas about loss development under the underlying policies, leading to different estimates of reserves and each party thinking they will get a good deal.*
  - *Both insurer and reinsurer think they will benefit from commutation due to different views on ceded reserves*
  - *Due to different reserve estimates, the reinsurance company believes its getting a great deal*
  - *Reinsurer sees a potential gain from the commutation*
  - *Believe they can pay less than the amount they value the liabilities*
  - *Potential tax benefit depending on commutation price*
- **Commutation clause in contract**
  - *Contractual agreement*
  - *Reinsurance contract has terms for when a commutation occurs*

## SAMPLE ANSWERS AND EXAMINER'S REPORT

### EXAMINER'S REPORT

Candidates were expected to demonstrate knowledge of the tax implications of a reinsurance commutation and motivations of a reinsurer to commute a contract.

#### Part a

Candidates were expected to recognize they needed to determine the change in taxes as a function of the commutation price for both the primary and the reinsurer. They then needed to set the change for each party equal to each other and solve for the price. To get the change in taxes they first needed to calculate the discounted ceded reserves from the perspective of each party using the triangles and other information given.

Common mistakes included:

- Using ultimate losses instead of reserves in performing the calculation
- Treating the net triangles given as gross
- Treating the net triangles given as ceded
- Using all three points in the triangle to calculate total reserves (as opposed to the just the most recent diagonal / evaluation)
- Incorrectly applying the discount factor (using  $0.9^2$  or  $0.9^{1.5}$  and  $0.9^{0.5}$  or no discount)
- Incorrectly applying the tax rate (multiplying by  $1 - \text{tax rate}$  rather than just tax rate)
- Incorrectly applying the reinsurance factor of 20% (applying to ultimates instead of reserves)
- Only commuting 1 of 2 years

#### Part b

Candidates were expected to list four motivations for commutation from the reinsurer's perspective.

Many candidates said that the reinsurer might be concerned about adverse development. This did not receive credit unless the candidate somehow captured the fact that they expected more adverse development than the primary insurer.

Common mistakes included:

- Stating the commutation would provide a cash flow injection – while this is true for the primary insurer, it is not for the reinsurer
- Repeating the same motivation as separate entries. For example “Exit a line of business” and “Exit a segment of business”.