

18. (2.75 points)

Given the following RBC information for an insurer as of December 31, 2018:

R0	0
R1	300,000
R2	
R3	500,000
R4	10,000,000
R5	1,000,000

- Total adjusted capital is \$18 million
- Total adjusted capital as a percent of Authorized Control Level (ACL) is 285%
- The insurer currently holds \$10 million of Class 06 unaffiliated stocks. Class 06 means “in or near default”
- Of the insurer’s top 10 largest equity investments, none are in Class 06
- The NAIC Class 06 RBC factor for equities is 0.3
- The insurer’s combined ratio for the current year is 125%

a. (0.25 point)

Briefly describe why this insurer fails the trend test.

b. (2 points)

Calculate the minimum amount of the Class 06 unaffiliated stocks that the insurer must convert to government bonds in order to achieve an RBC ratio of 300%.

c. (0.5 point)

Identify the usual range for IRIS ratio 5 (Two-Year Overall Operating Ratio), and briefly describe one reason why it may be outside of the usual range for this insurer.

SAMPLE ANSWERS AND EXAMINER'S REPORT

Candidates were expected to identify the correct premium and commission elements from the annual statement to calculate the Ceded Commission Ratio and, as a result, Surplus Aid. Candidates then needed to calculate IRIS Ratio 4 and comment on its reasonableness.

Common errors included:

- Failure to include both Reinsurance Ceded Commission elements when calculating Ceding Commission Ratio
- Failure to include both Reinsurance Premium Ceded elements when calculating Ceding Commission Ratio
- Including Ceded UEPR – Affiliates in the calculation of Surplus Aid
- Incorrect usual range used in determining reasonableness of IRIS Ratio 4 calculated

Part b

Candidates were expected to identify the correct asset and liability elements from the annual statement to calculate Adjusted Liabilities and Liquid Assets. Candidates then needed to calculate IRIS Ratio 9 and comment on its reasonableness.

Common errors include:

- Failure to subtract Deferred Assets from Total Liabilities when calculating Adjusted Liabilities
- Subtracting uncollected premium (15.1) from Total Liabilities
- Failure to subtract Investment in Parent, Sub, & Affiliates when calculating Liquid Assets
- Failure to include all the needed line items when calculating Liquid Assets
- Incorrect usual range used in determining reasonableness of the calculated IRIS Ratio 9

FALL 2019 EXAM 6U, QUESTION 18

TOTAL POINT VALUE: 2.75

LEARNING OBJECTIVE: C2

SAMPLE ANSWERS

Part a: 0.25 point

Sample 1

The company's RBC Ratio is between 200% and 300% and its combined ratio is greater than 120%

Sample 2

The combined ratio of 125% is greater than 120%

Part b: 2 points

Sample 1

$$285\% = 18m / ACL \rightarrow ACL = 6,315,789$$

$$RBC = ACL \times 2 = 12,631,578$$

$$12,631,578 = 0 + (300,000^2 + R2^2 + 500,000^2 + 10,000,000^2 + 1,000,000^2)^{.5}$$

$$7,629,992 = \text{Current } R2$$

$$300\% = 18m / ACL \rightarrow ACL = 6m \rightarrow RBC = 12m$$

SAMPLE ANSWERS AND EXAMINER'S REPORT

$$12,000^2 = 300^2 + R2^2 + 500^2 + 10,000^2 + 1,000^2$$

$$6,531,462 = R2 \text{ needed}$$

$$R2 \text{ decrease needed} = 7,629,992 - 6,531,462 = 1,098,530$$

$$\text{Insurer needs to convert } 1,098,530 / .3 = 3,661,767$$

Sample 2

$$2.85 = 18 / \text{ACL} \text{ so } \text{ACL} = 6.32\text{M} \text{ and } \text{RBC} = 6.32 * 2 = 12.63\text{M}$$

$$12.63 = \text{sqrt}(.3^2 + R2^2 + 0.5^2 + 10^2 + 1^2)$$

$$\text{So current } R2 = 7.63\text{M}$$

$$7.63 = .3 * 10 + y$$

$$y = 4.63\text{m} = \text{component of } R2 \text{ not from Class 6 unaffiliated stocks}$$

Government bonds get RBC factor of 0 so R1 will stay the same and R2 will decrease

$$3 = 18 / \text{ACL}^* \text{ so } \text{ACL}^* = 6\text{m} \text{ and } \text{RBC}^* = 6 * 2 = 12\text{M}$$

$$12 = \text{sqrt}(.3^2 + R2^{*2} + 0.5^2 + 10^2 + 1^2)$$

$$\text{So new } R2^* = 6.53\text{m}$$

$$6.53 = 4.63 + .3x$$

$$x = 6.33\text{m} = \text{amount of Class 6 stocks to retain}$$

$$10 - 6.33 = 3.67$$

Convert 3.67m of unaffiliated stock to government bonds to achieve RBC ratio of 300%

Sample 3

$$\text{Current RBC} = (18/2.85)/.5 = 12.631$$

$$\text{Target RBC} = (18/3)/.5 = 12$$

Assume government bonds are not backed by the US government and will therefore have an RBC charge of 0.003.

$$12.63 = \text{sqrt}(.3^2 + R2^2 + 0.5^2 + 10^2 + 1^2)$$

$$\text{So current } R2 = 7.63\text{M}$$

Let x = amount of Class 6 stocks to convert

$$\text{Target } R1 = 0.3 + 0.0003x$$

$$\text{Target } R2 = 7.63 - 0.3x$$

$$12^2 = (.3 + 0.0003x)^2 + (7.63 - .3x)^2 + 0.5^2 + 10^2 + 1^2$$

$$42.75 = .090009x^2 - 4.5762x + 58.3069$$

$$.090009x^2 - 4.5762x + 15.5569 = 0$$

$$\text{Solve for } x \text{ using quadratic formula: } \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = 3.663506$$

Convert \$3,663,506 of Class 6 stocks into government bonds

SAMPLE ANSWERS AND EXAMINER'S REPORT

Part c: 0.5 point

Sample Responses for usual range of IRIS ratio 5 (any one of the following):

- The usual range for IRIS ratio 5 is up to 100%
- The unusual range for IRIS ratio 5 is greater than 100%

Sample responses for the reason why IRIS ratio 5 might be outside the usual range for the insurer (any one of the following):

- It may be outside the range because the current year's combined ratio is 125%. The prior year would have had to have been very profitable to get IRIS ratio 5 into the usual range
- The insurer may have suffered a catastrophe loss
- Investment in risky stocks could lead to very volatile returns
- High expenses due to inefficient operations may cause a high IRIS 5
- High loss ratio
- The insurer may be trying to grow rapidly which could lead to high loss and expense ratios
- High R4 RBC component, implying possible adverse development of reserves which would result in a high loss ratio
- High commission expenses to agents leading to high expense ratio

EXAMINER'S REPORT

Candidates were expected to be familiar with the trend test. In addition, candidates were expected to understand the relationship between Authorized Control Level capital and Risk Based Capital. They were further expected to understand Risk Based Capital and its underlying formula. Finally, candidates were expected to be familiar with IRIS ratio 5 (Two-Year Overall Operating Ratio) and the components of the Operating Ratio.

Part a

Candidates were expected to be familiar with trend test and the threshold of combined ratio to fail the test.

Common errors included:

- Incorrectly identifying the threshold as 100%
- Mentioning that the insurer fails the test because its combined ratio is 125%, without also noting that this fails the test because it is greater than the threshold of 120%

Part b

Candidates were expected to understand the relationship between Authorized Control Level and Risk Based Capital. They were further expected to know the formula for Risk Based Capital in order to calculate the current value for R2 as well as the target value. Candidates were then expected to recognize that to accomplish this reduction in R2 they had to divide the difference by the charge provided for NAIC Class 06 RBC factor for equities (0.3).

SAMPLE ANSWERS AND EXAMINER'S REPORT

Some candidates assumed that the government bonds referred to in the question were not guaranteed by the US government, and would therefore receive an RBC charge of 0.003. This required candidates to note that this would cause R2 to decrease by 0.3 multiplied by the amount converted, and R1 to increase by 0.003 multiplied by the amount converted.

Common errors included:

- Calculating $R2 = 0.3 * 10m$, ignoring other R2 components
- Using a charge other than 0.3 on NAIC Class 6 stocks
- Forgetting to divide the difference in R2 by 0.3
- Assuming government bonds have a charge of 0.003 and that this would cause R2 to reduce by $(0.3 - .003) * (\text{amount converted})$, instead of adding the charge to R1
- Taking the difference in Target & Current RBC instead of R2
- Not multiplying the ACL by 2 to get the RBC
- Confusing the amount of Class 06 stock to retain with the amount to sell

Part c

Candidates were expected to be familiar with IRIS ratio 5 (Two-Year Overall Operating Ratio) and the components of the Operating Ratio.

A wide range of answers were accepted for why IRIS ratio 5 might be outside the usual range for the insurer, as long as it provided a reason that might increase the overall operating ratio. Many candidates did well describing the usual IRIS ratio 5 (Two-Year Overall Operating Ratio) and highlighting a component of the Operating Ratio.

Common errors included:

- Stating that the usual range was over 100%
- Identifying the usual range for investment income instead of the usual range for IRIS ratio 5
- Not providing a reason that would cause Operating Ratio to be high

FALL 2019 EXAM 6U, QUESTION 19

TOTAL POINT VALUE: 2

LEARNING OBJECTIVE: C2

SAMPLE ANSWERS

Part a: 0.75 point

Sample 1

R4 Charge before LCF = $12m / .85 = 14,117,647$

Sum of RBC charges ex HO = $3.8m + 4.7M = 8.5m$

HO RBC % = $1 - (3.8m + 4.7m) / 14,117,647 = 40\%$

Sample 2

x= HO R4 Charge

$12 = .85(x + 3.8 + 4.7)$

$12 / .85 = x + 8.5$