

EXAM 6 – UNITED STATES, SPRING 2015

25. (6.25 points)

Given the following information for an insurance company as of December 31, 2013:

- Risk charges under the NAIC’s Risk-Based Capital (RBC) formula for 2013:

$R_0 = \$11,000,000$

$R_1 = \$6,000,000$

$R_2 = \$5,000,000$

$R_3 = \$2,000,000$, excluding the credit risk charge

- The company has neither tabular nor non-tabular discounts.
- The company has no accident and health or loss-sensitive business.
- The excessive growth charge is not applicable.
- Total adjusted capital: \$130,000,000
- Net Loss & LAE Unpaid: \$170,000,000
- Net Written Premium: \$200,000,000
- Existing Reinsurance Recoverables: \$30,000,000
- Applicable RBC information:

| | Loss & LAE | Written Premium |
|-------------------------------------|------------|-----------------|
| Company RBC percent | 20% | 25% |
| Adjustment for investment income | 95% | 90% |
| Portion from company’s largest line | 100% | 100% |

- The company is considering purchasing additional reinsurance in 2014 to supplement the existing reinsurance program. It is considering three reinsurance contracts, each covering a named peril as displayed below:

| | Option #1 | Option #2 | Option #3 |
|--|---------------|--------------|-------------|
| | Hurricane | Earthquake | Tornado |
| Gross insured loss amount if event occurs | \$100,000,000 | \$15,000,000 | \$2,000,000 |
| Reinsured portion of insured losses from event | 60% | 25% | 100% |
| Probability of event occurring | 15% | 2% | 1% |
| Reinsurance premium | \$20,000,000 | \$1,000,000 | \$1,200,000 |

- All contract options assume premium is paid on January 1, 2014 with expected payment of ceded losses on July 1, 2015. The reinsurer considers 3.0% to be a reasonable interest rate.
- The company did not experience any losses from hurricanes in 2013.

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25. (continued)

a. (0.75 point)

For each reinsurance option, briefly explain whether it passes the 10-10 rule for risk transfer.

b. (1.5 points)

Without using the 10-10 rule, justify the assertion that each contract qualifies for risk transfer.

c. (4 points)

In order to evaluate the potential benefit of the additional reinsurance being considered in 2014, the company has modeled the impact of the hurricane treaty as if there had been a hurricane in 2013.

The following assumptions were used by the company in its model:

- Insured losses from the hypothetical hurricane were \$100,000,000 in 2013, with \$0 paid as of December 31, 2013.
- Hurricane reinsurance premiums were funded by selling class 4 unaffiliated bonds from the company's existing investment portfolio.

Calculate the company's hypothetical 2013 RBC ratio assuming that the hurricane reinsurance contract qualifies for risk transfer.

SAMPLE ANSWERS AND EXAMINER'S REPORT

| | |
|--|----------------------------------|
| QUESTION 25 | |
| TOTAL POINT VALUE: 6.25 | LEARNING OBJECTIVE: C2/E1 |
| SAMPLE ANSWERS (BY PART, AS APPLICABLE) | |
| Part a: 0.75 point | |
| <ul style="list-style-type: none"> • Option 1: Loss = $(.6 \times \\$100M - \\$20M)/\\$20M = 200\%$ and probability of loss = 15%; • Option 2: Loss = $(.25 \times \\$15M - \\$1M)/\\$1M = 275\%$ and probability of loss = 2%; • Option 3: Loss = $(1.0 \times \\$2M - \\$1.2M)/\\$1.2M = 66.67\%$ and probability of loss = 1%; <p>As shown above: Pass: Option 1 has a 10% chance of a 10% or greater loss, Fail: Options 2 & 3 do not have a 10% chance of loss, fail.</p> | |
| Part b: 1.5 points | |
| <p>Sample answer 1:</p> <ul style="list-style-type: none"> • Option 1: ERD = $[(0.6 \times 100,000,000/1.03^{1.5} - 20,000,000) \times 0.15]/20,000,000 = 28.05\% > 1\%$, Pass ERD • Option 2: ERD = $[(0.25 \times 15,000,000/1.03^{1.5} - 1,000,000) \times 0.02]/1,000,000 = 28.05\% > 5.17\%$, Pass ERD • Option 3: Substantially all of risk is transferred, so meets risk transfer. <p>Sample answer 2:</p> <ul style="list-style-type: none"> • Option 1: ERD = $[(0.6 \times 100,000,000/1.03^{1.5} - 20,000,000) \times 0.15]/20,000,000 = 28.05\% > 1\%$, Pass ERD • Option 2: ERD = $[(0.25 \times 15,000,000/1.03^{1.5} - 1,000,000) \times 0.02]/1,000,000 = 5.17\% > 1\%$, Pass ERD • Option 3: ERD = $[(1.00 \times 2,000,000/1.03^{1.5} - 1,200,000) \times 0.01]/1,200,000 = 0.6\% < 1\%$, Fail ERD | |
| Part c: 4 points | |
| <p>Assuming a hurricane and treaty in 2013 Premium = 20M Gross loss incurred = 100M Ceded = $60\% \times 100M = 60M$, retained = 40M PHS = $130M - 20M - 40M = 70M$ Reinsurance Recov = $30M + 60M = 90M$ $R_3 = 2M + 0.5 \times 0.1 \times 90M = 6.5M$ R_4: new reserve = $170M + 40M = 210M$</p> <p>$((1 + 20\%) \times 0.95 - 1) \times 210M = 0.14 \times 210M = 29.4M$ $R_4 = 29.4M + 0.5 \times 0.1 \times 90M = 33.9M$</p> <p>$R_5$: Net WP = $200M - 20M = 180M$ $R_5 = ((1 + 25\%) \times 0.90 - 1) \times 180M = 22.5M$</p> | |

SAMPLE ANSWERS AND EXAMINER'S REPORT

Adjust R_1 to account for selling of Class 4 bond (0.045 RBC charge)

$$R_1 = 6 - 0.045 \times 20M = 5.1M$$

So $R_0 = 11M$ adj. PHS = 70M

$$R_1 = 5.1M$$

$$R_2 = 5M$$

$$R_3 = 6.5M$$

$$R_4 = 33.9M$$

$$R_5 = 22.5M$$

$$\begin{aligned} RBC &= R_0 + (R_1 + R_2 + R_3 + R_4 + R_5)^{0.5} \\ &= 11 + (5.1 + 5 + 6.5 + 33.9 + 22.5)^{0.5} \\ &= 52.8M \end{aligned}$$

$$ACL = 0.5 \times 52.8 = 26.4$$

$$RBC \text{ Ratio} = (\text{Adj. PHS}/ACL) = 70/26.4 = 2.65$$

EXAMINER'S REPORT (BY PART, AS APPLICABLE)

General Overview

The candidate was expected to know how to apply the 10/10 rule when determining whether a contract should be accounted for as reinsurance. In addition to the 10/10 rule, they were required to use other justification (i.e. Expected Reinsurer Deficit). The last part of the question dealt with calculating a RBC Ratio. The candidate was expected to know the adjustments that needed to be made to each of the RBC components when adding the Hurricane reinsurance contract to the insurer's current book of business.

Overall, the question was a very difficult one in that it involved multiple calculations and required the candidate to know the formulas and percentages that were needed when calculating the RBC formula and ratio.

There was a lot of confusion around the calculation of R_5 because an UW Expense Ratio was not given in the problem. The missing information implicitly resulted in an increase in the Blooms level for this question, requiring candidates to think about how to handle the missing assumption. In recognition of this, multiple responses were considered for full credit. Please see the Part (c) subsection below for each of the solutions that were considered.

Part a

- The candidate was expected to know how to apply the 10/10 rule to see if a reinsurance contract would be eligible to be treated as reinsurance under accounting rules.
- The candidate was expected to apply the 10/10 rule to each contract and state whether or not the contract passed.

SAMPLE ANSWERS AND EXAMINER'S REPORT

- Candidates generally scored well in this section and either knew the 10/10 rule or left the section blank. A few candidates did respond to the question without applying the 10/10 rule.

Part b

- The candidate was expected to know how to determine if a reinsurance contract would be eligible to be treated as reinsurance under accounting rules without using the 10/10 rule
- The question did not tell the candidates how to determine the accounting treatment and left it up to them.
- A large majority of candidates chose to use the Expected Reinsurer Deficit method to determine whether the contract was eligible to be treated as reinsurance. In many cases the candidate failed to take into account discounting, did not subtract the premium within the calculation, or did not use the correct calculation altogether.
- Some candidates answered using underwriting and timing risk and stating if they applied to each of the contracts, but did not justify their answers.
- This part of the question was challenging for the candidates.

Part c

- The candidate was expected to know how to adjust the RBC calculation for an insurance company for an additional reinsurance contract purchased and a reinsured event happening
- The question was very challenging, in particular because no expense ratio was given. This was accounted for in the grading of R_5 by accepting the following calculations

Approach A (no expense ratio assumption, 1+loss and ALAE ratio)

Revised R5=Net Premium × [(1+Comp RBC Loss & ALAE %) × Adj Inv Inc – 1]

Approach B (with expense ratio assumption, 1+loss and ALAE ratio)

Revised R5=Net Premium × {(1+Comp RBC Loss & ALAE %) × Adj Inv Inc]+UW Exp Ratio – 1}

Approach C (no expense ratio assumption, loss & ALAE Ratio)

Revised R5=Net Premium × [(Comp RBC loss & ALAE %) × Adj Inv Inc – 1]

Approach D (with expense ratio assumption, loss & ALAE Ratio)

Revised R5=Net Premium × {(Comp RBC loss & ALAE %) × Adj Inv Inc]+UW Exp Ratio – 1}

- Common areas where candidates had issues includes:
 - Remembering the correct RBC charge for class 4 bonds,
 - Determining the credit risk adjustment to the revised R_3 and R_4,
 - Using the wrong reserves in the R_4 calculation,
 - Using the wrong net written premium in the R_5 calculation,
 - Not adjusting the policyholder surplus for the cost of the reinsurance or the benefit of the reinsurance recoveries.