18. (4.5 points)

Given the following data:

		Line of Business		
		Commercial Auto Liability	General Liability	Workers' Compensation
(1)	Industry average loss & LAE ratio for past 10 years			0.982
(2)	Company average loss & LAE ratio for past 10 years			1.043
(3)	Industry loss & LAE ratio			1.018
(4)	Adjustment for investment income			0.817
(5)	Company current year net written premium ($000s)	15,000	6,900	8,200
(6)	Company underwriting expense ratio			0.335
(7)	Portion of reserves on retro-rated plans			
	(a) % direct loss sensitive			11.4%
	(b) % assumed loss sensitive			3.5%
	Net Written Premium RBC after discount ($000s)	570,000	84,380	

R_0	$2,400,000
R_1	$1,300,000
R_2	$2,900,000
R_3	$1,800,000
R_4	$7,300,000
Excessive Premium Growth charge	$20,462
Policyholders' Surplus	$5,3000,00

R_3 and R_4 have been adjusted for reinsurance recoverables.

a. (3.5 points)

Calculate RBC.

b. (0.5 point)

Briefly describe two ways reserving practices could be modified to move a company from Regulatory Action Level to Company Action Level.

c. (0.5 point)

Describe why RBC is not a fail-safe test of financial impairment.

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QUESTION 18	
TOTAL POINT VALUE: 4.5	**LEARNING OBJECTIVE: C2**

SAMPLE ANSWERS

Part a: 3.5 points

Sample 1:

WC Base = 8200 * ((.5)(1.018)(1 + 1.043/0.982)*0.817 + 0.335 – 1) = 1578.8

LSD = 1578.8 * ((0.114)(0.3) + (0.035)(0.15)) = 62.28

PCF = (15000/(15000+6900+8200))*0.3 + 0.7 = 0.85

WP RBC = [570000 + 84380 + (1578.8 - 62.28)]*0.85 + 20462 = 577,647

RBC = $2.4\text{M} + \sqrt{1.3^2 + 2.9^2 + 1.8^2 + 7.3^2 + 0.577647^2}$ = 10,583,134

Sample 2:

WC R5 = 8200 * ((1/2) (1 + 1.043/0.982) (1.018) *0.817 + 0.335 – 1) = 1578.8

LS Discount = 1578.81 * (1 - 0.114*0.3 - 0.035*0.15) = 1516.53

PCF = 0.7 + 0.3 * (15000/(15000+6900+8200)) = 0.8495

R5 = 0.8495 * (570000 + 84380 + 1,516,530) + 20462 = 1,864,650

RBC = $2.4\text{M} + \sqrt{1.3^2 + 2.9^2 + 1.8^2 + 7.3^2 + 1.864650^2}$ = 10.77M

Sample 3:

R5 = (1.043*1.018/0.982 + 1.018) *50%*0.817 + 0.335 – 1 = 0.1925 * 8200 = 1,578,812

0.3 * 0.114 + 0.15 * 0.035 = 3.945% → 1,516,528

+ 520,000,000

+ 84,380,000

655,896,528 * $(\frac{15}{30.1} * 0.3 + 0.7)$ = 557,185,190

+ 20,462

R5 = 557,205,652

RBC = $\text{R}_0 + \sqrt{\text{R}_1^2 + \text{R}_2^2 + \text{R}_3^2 + \text{R}_4^2 + \text{R}_5^2}$ = 559,665,438

Part b: 0.5 point

- Use less conservative reserving methods/assumptions to book lower reserves
- Use tabular discounting on reserves to increase surplus
- Change from non-tabular discounting to tabular discounting
- Refine reserving practices to avoid over-reserving
- Addition of loss-sensitive reinsurance (increase reinsurance offset)
- Addition of retro-rated reinsurance (increase reinsurance offset)
- Change from gross of salvage and subrogation to net of salvage and subrogation

Part c: 0.5 point

- RBC is somewhat arbitrary and was intended to be a measure of minimum capital requirements. It does not factor in all risks, such as catastrophe risk and interest rate risk.
- There are many financial risks that RBC does not consider, including catastrophe risk, interest rate risk, quality of business written, quality of reinsurance.
- RBC does not include risk that reserves are currently inadequate, which is a historically significant risk. RBC does not distinguish reinsurers by relative collectability and may not detect significant reinsurer credit risk.
- It does not consider all risks, such as the risk from interest rate risk, asbestos risk,

catastrophe risk.
- RBC is the minimum level a company should hold. Also, factors used are industry factors, so they are for average companies – if a company is unique then the factors used in calculating RBC are inappropriate.
- Methodology is formulaic & standardized, so it will not pick up on individual risks of a particular company, such as quality of reinsurer.

EXAMINER'S REPORT

Part a

Graders recognized the confusion surrounding the labeling of "Net Written Premium RBC after discount in $000s". Credit was awarded to candidates regardless of the order of magnitude used throughout the calculation. Graders also recognized the comma error in Policyholder's Surplus. This number was not utilized in the answer, and it did not affect results.

Candidates performed well on this problem. Common errors included:
- Utilizing the Inverse of the Ratio of Company Loss & LAE Ratio to Industry
- Confusing Industry Average Loss & LAE Ratio for past 10 years with Industry Loss & LAE Ratio
- Multiplying Adjustment for Investment Income by Underwriting Expense Ratio in calculation of Base Loss & LAE Premium RBC Charge
- Not subtracting '1' in the Base Loss & LAE Premium RBC Charge formula
- Not calculating Loss Sensitive Discount
- Applying Loss Sensitive Factor to All Lines
- Applying Loss Sensitive Factor to Net Written Premium
- Not distinguishing between direct loss sensitive and assumed loss sensitive
- Utilizing GL or WC premium distribution in Premium Concentration Factor calculation
- Utilizing .3+.7*.5 in the Premium Concentration Factor calculation
- Applying Premium Concentration Factor to only WC
- Applying Premium Concentration Factor to Excess Charge
- Not considering Premium Concentration Factor
- Not adding Excess Charge to R_5
- Adding Excess Charge to R_4

Part b

In general candidates struggled to provide two different reserving practices that would affect the components. Common errors included identifying solutions which were not reserving practices, or stating the same solution twice.

Part c

Candidates performed very well on this part and demonstrated an understanding of the shortcomings of RBC since the texts focus on the calculation and provide commentary on other metrics to be used in conjunction with RBC. A common error was stating that RBC is not failsafe because it must be used with other metrics to evaluate financial impairment. This is not a reason why RBC has shortcomings, but rather a good practice because it has shortcomings.