

**EXAM 6 – CANADA, FALL 2014**

14. (3.5 points)

The following information is available for a property and casualty insurance company that writes both personal and commercial automobile business. All amounts are in thousands dollars (\$000s).

Assets	Balance Sheet Value	Asset Risk Factor
Bond	200,000	0%
Preferred Stock	50,000	15%
Common Stock	50,000	15%
Mortgage Loans	50,000	5%
Agent Balances Receivables	8,000	5%
Reinsurance Recoverables	40,000	10%

	Commercial Automobile	Personal Automobile
Deficiency Factor	1.05	1.08
Discount Factor	0.89	0.88
Baseline Capital Factor for Loss Reserve	0.38	0.38
Baseline Capital Factor for Premium	0.36	0.39
Company Size Factor	0.95	0.95
Company Stability Factor	1.10	1.15
Company Profit Factor	1.02	1.00

Spread of risk factor	16%
Potential market depreciation of fixed income securities after 120 bps interest rate rise	29,000
Liquid assets	350,000
Gross PML	30,000
Credit Risk	5.4
Net written premium for commercial automobile	11,000
Net written premium for personal automobile	25,000
Carried reserve for commercial automobile	21,000
Carried reserve for personal automobile	77,000
Diversification factor for loss reserves	0.9357
Diversification factor for premium	0.9083
Growth factor	1.0
Adjusted surplus (APHS)	55,000

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(14 cont.)

Calculate the following under A. M. Best's Capital Adequacy Ratio (BCAR) rules:

a. (1.5 points)

Asset risk

b. (1.25 points)

Underwriting risk

c. (0.75 point)

BCAR ratio assuming there is no business risk and that the risk covariance can reduce capital by 35%.

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## EXAM 6C FALL 2014 SAMPLE ANSWERS AND EXAMINER'S REPORT

### QUESTION: 14

TOTAL POINT VALUE: 3.5

LEARNING OBJECTIVE(S): C1

SAMPLE/ACCEPTED ANSWERS:

Part a: 1.5 points

Investment Risk =  $(200*0\%+50*15\%+50*15\%+50*5\%)*(1+\text{Spread of Risk Factor})=17.5*1.16=20.3$

PML/Liquid Assets =  $30/350=8.57\% < 10\%$  of minimum Catastrophe Exposure

Interest Rate Risk = Potential Market Depreciation \* % Catastrophe Exposure =  $29*10\%=2.9$

Minimum Reinsurance Dependence Required Capital = 5.4

Asset Risk = Investment Risk + Interest Rate Risk + Credit Risk =  $20.3+2.9+5.4=28.6$

Part b: 1.25 points

Loss and LAE Reserve Required

Capital =  $21*1.05*0.89*0.38*0.95*1.1+77*1.08*0.88*0.38*0.95*1.15=38.17$

(Company Profit Factor is not used for Loss and LAE Reserve Risk)

Growth Factor = 1

Loss and LAE Reserve Risk =  $38.17*1*0.9357=35.72$

Net Premiums Written Required Capital =  $11*0.36*0.95*1.02+25*0.39*0.95*1.0=13.1$

(Company Stability Factor is not used for Net Premiums Written Risk)

Growth Factor = 1

Net Premiums Written Risk =  $13.1*1*0.9083=11.90$

Assume Business Risk = 0

Underwriting Risk =  $35.72+11.90=47.62$

Part c: 0.75 point

Gross Required Capital =  $28.6+35.72+11.90=76.22$

Net Required Capital =  $76.22*(1-35\%)=49.54$

BCAR =  $\text{APHS}/\text{NRC}=55/49.54=111\%$

### EXAMINER'S REPORT:

#### General Commentary

- Candidates are expected to understand the composition of the asset risk and identify the associated figures given in the question for calculation. Candidates are also expected to understand and calculate the underwriting risk as well as BCAR ratio formula.
- Candidates generally did better in parts b and c than part a.
- Common mistakes include
  - Missing the spread of risk factor in the calculation of the investment risk;
  - Failing to consider the minimum catastrophe exposure;

## EXAM 6C FALL 2014 SAMPLE ANSWERS AND EXAMINER'S REPORT

- Failing to consider credit risk in asset risk calculation.