

EXAM 6 – CANADA, SPRING 2018

17. (3 points)

The following information is available for a property and casualty insurance company as at December 31, 2017. All amounts are in millions of dollars.

East Canada PML 500	130
West Canada PML 500	300
East Canada PML 250	80
West Canada PML 250	200
Financial resources to support the company's earthquake risk	150

Where PML represents the Probable Maximum Loss

Other information:

- The company does not purchase reinsurance.
- The company is phasing in the use of PML 500 until 2022.

a. (1.5 points)

Calculate the Earthquake Reserve Component for 2017.

b. (1 point)

Briefly describe four sound earthquake modeling best practices.

c. (0.5 point)

Identify two financial resources that could be used to support the company's earthquake exposures.

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EXAM 6C SPRING 2018 SAMPLE ANSWERS AND EXAMINER'S REPORT

QUESTION 17	
TOTAL POINT VALUE: 3	LEARNING OBJECTIVE(S): C1
SAMPLE ANSWERS	
Part a: 1.5 points	
<p>East Canada PML 420 = 0.68 * East Canada PML 500 + 0.32 * East Canada PML 250 = 0.68 * 130 + 0.32 * 80 = 114</p> <p>West Canada PML 420 = 0.68 * West Canada PML 500 + 0.32 * West Canada PML 250 = 0.68 * 300 + 0.32 * 200 = 268</p> <p>Countrywide PML 500 = (East Canada PML 500^{1.5} + West Canada PML 500^{1.5})^{1/1.5} = (130^{1.5}+300^{1.5})^{1/1.5} = 354.63</p> <p>ERC = Countrywide PML 500*(2017-2014)/8 + max(East Canada PML 420, West Canada PML 420)*(2022-2017)/8 – financial resource = 354.63 * 3/8 + 268 * 5/8 – 150 = 150.49</p>	
Part b: 1 point	
<p><u>Sample answers included any four of the following:</u></p> <ul style="list-style-type: none"> • Document how the use of earthquake models fits within their earthquake risk management process • Understand current modelling alternatives and why the model used is appropriate for the applicable insurance portfolio • Ensure there are adequately qualified staff to appropriately run the models on a regular basis when earthquake models are used in-house • Have a sound understanding of the key assumptions, methodologies and limitations underlying the model used • Understand model uncertainty and how this is addressed in determining capital adequacy and related reinsurance arrangements • Have evidence that the granularity and quality of data used is appropriate for the model • When more than one model is used and they produce materially different results, be able to explain the results of their efforts to identify the key reasons for the differences and explain how this work is reflected in parameterization and adjustments (if any) to the particular model(s) chosen as the basis for PML • Take company risk profile and risk appetite into consideration • Compare model with commercial software available • Ask expert opinion on the right way to use the model • Regularly update the model/use the latest version • Use more than one model • Compare results with historical events • If using in-house method, monitor results regularly • Understand how the model includes fire following, demand surge and storm surge and how they impact PML • Have a sound understanding of modelled losses versus non-modelled losses 	

EXAM 6C SPRING 2018 SAMPLE ANSWERS AND EXAMINER'S REPORT

Part c: 0.5 point

Sample answers included any two of the following:

- Capital and surplus
- Earthquake premium reserves
- Reinsurance coverage
- Capital market financing (cat bond etc.)

EXAMINER'S REPORT

Candidates were expected to demonstrate knowledge of the earthquake risk reserve component calculation, earthquake modeling and financial resources to support earthquake reserve exposures.

Part a

Candidates were expected to know how to calculate the East Canada PML400, the West Canada PML400 and the country-wide PML500 in order to calculate the Earthquake Reserve Component with the phase-in approach.

Common mistakes included:

- Forgetting to subtract the financial resources available
- Reversing the ratios in the phase-in calculation

Part b

Candidates were expected to identify four sound earthquake modelling practices.

A common error included identifying less than four practices.

Part c

Candidates were expected to identify two possible financial resources to support earthquake exposures.

A common error included identifying only one resource.