5. (2.5 points)

Given the following information for a boat owners insurer:

- On July 1, 2014, a rate change of +10% went into effect.
- 2014 earned premium = $1,000.
- Policies are written on an annual basis.

a. (0.75 point)

Assuming uniform writings, calculate the calendar year 2014 on-level earned premium using the parallelogram method.

b. (1.25 points)

Due to the seasonality of boat owners coverage, assume that the policy distribution of the book of business was as follows (with uniform distribution within each quarter):

Quarter 1	10%
Quarter 2	50%
Quarter 3	30%
Quarter 4	10%

Calculate the calendar year 2014 on-level earned premium, accounting for this assumed policy distribution.

c. (0.5 point)

For the scenario in part b. above, describe another approach the insurer could take to calculate the on-level earned premium.

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EXAM 5 SPRING 2015 SAMPLE ANSWERS AND EXAMINER'S REPORT

QUESTION: 5

TOTAL POINT VALUE: 2.5

LEARNING OBJECTIVE(S): A3

SAMPLE/ACCEPTED ANSWERS:

Part a: 0.75 point

2014 on-level factor = (0.875 * 1.0) + (0.125 * 1.1) = 1.0125

2014 on-level premium = $1000 * 1.1 / 1.0125 = $1,086.42

Part b: 1.25 points

Sample 1:

Q1: 1.00
Q2: 1.00
Q3: 0.875(1.00) + 0.125 (1.10) = 1.0125
Q4: 0.625(1.00) + 0.375(1.10) = 1.0375
Total = 10% + 50% + (30% * 1.0125) + (10% * 1.0375) = 1.0075
On-level premium = $1000 * (1.1 / 1.0075) = $1,091.81

Sample 2:

Q3: 0.3 x (4.5/12) = 0.1125
Q4: 0.1 x (1.5/12) = 0.0125
Percent at New Rate Level = 0.1125 + 0.0125 = 0.125
Percent at Previous Rate Level = 1 - .125 = .875
Average Rate Level = 1.1 x 0.125 + 1.0 x 0.875 = 1.0125
On-Level Premium = $1000 x (1.1/1.0125) = $1,086.42

Part c: 0.5 point

Sample 1:

The insurer could use the extension of exposures technique to re-rate historical policies using the current rates, and then re-calculate the earned amounts.

Sample 2:

The insurer could use the parallelogram method on smaller time periods, such as daily or monthly, and then aggregate the on-level premium from the smaller time periods to determine the total on-level earned amount.

EXAM 5 SPRING 2015 SAMPLE ANSWERS AND EXAMINER'S REPORT

EXAMINER'S REPORT:

General Commentary

Candidates performed well on this question in total, particularly on parts a. and c.

Part a

Candidates were expected to calculate on-level premium using the parallelogram method. Overall, candidates did very well on this part. The most common errors were incorrectly calculating the area associated with a particular rate level or a calculation error.

Part b

Candidates were expected to calculate on-level premium using the parallelogram method and taking into account an uneven earning pattern. There were two answers accepted, depending on how the candidate interpreted the pattern given, both of which were included in the sample answers above. There was a high variability in the performance of candidates on this part.

A common error was miscalculating the areas associated with each rate level. Making an adjustment for an uneven earning pattern was also difficult for many candidates. In addition, many candidates forgot to take into account earned premium coming from previous policy years and tried to calculate on-level premium using only four policy quarters.

Part c

Candidates were expected to identify another method, other than the standard parallelogram method, to determine the answer to part b. Overall, candidates did well on this part, with the most common answer to this question explaining that the extension of exposures method could be used to answer part b.

One common mistake was not briefly describing the extension of exposures method. Credit for other methods was also given as long as a reasonable explanation was provided.