23. (1.75 points)

Given the following information as of December 31, 2013:

Accident Year	Selected Ultimate Claims	Reported Claims	Paid Claims
2013	$1,150	$500	$250

Age in Months	Selected Cumulative Percent Reported	Selected Cumulative Percent Paid
36	100%	100%
24	80%	55%
12	A	20%

- The expected reported claims for accident year 2013 during calendar year 2014 are $433.
- The expected paid claims for accident year 2013 during calendar year 2014 are $394.

a. (0.75 point)

Calculate "A", the selected cumulative percent reported at 12 months.

b. (1 point)

Assume that the actual paid and reported claims for accident year 2013 in calendar year 2014 are equal to the expected paid and reported claims for accident year 2013 in calendar year 2014.

Calculate the unpaid claim estimate for accident year 2013 as of December 31, 2014 using the case outstanding development technique.

END OF EXAMINATION

EXAM 5 SPRING 2014 SAMPLE ANSWERS AND EXAMINER'S REPORT

QUESTION: 23

TOTAL POINT VALUE: 1.75 points

LEARNING OBJECTIVE(S): B8

SAMPLE/ACCEPTED ANSWERS:

Part a: 0.75 point

$$\text{IBNR} = 1150 - 500 = 650$$

$$433 = 650\left(\frac{0.8 - A}{1 - A}\right)$$

$$0.66615 = \frac{0.8 - A}{1 - A}$$

$$0.66615 - 0.66615A = 0.8 - A$$

$$0.33385A = 0.13385$$

$$A = 0.40$$

Part b: 1 point

Sample 1:

$$=\text{Case}\left(\frac{(\text{Reported CDF}-1)(\text{Paid CDF})}{\text{Paid CDF}-\text{Reported CDF}}\right)+1$$

$$= \big((500 + 433) - (250 + 394)\big)\left(\frac{\left(\frac{1}{0.8} - 1\right)\left(\frac{1}{0.55}\right)}{\frac{1}{0.55} - \frac{1}{0.8}}+1\right)$$

$$= (289)(1.8)$$

$$= \$520.20$$

Sample 2:

Reported as of 12/31/2014 = 500 + 433 = 933

Paid as of 12/31/14 = 250 + 394 = 644

Case reserve as of 12/31/14 = 933-644 = 289

$$\text{Unpaid} = 289\left(1 + \frac{\text{IBNR}}{\text{CASE}}\right)$$

$$= 289\left(1 + \frac{\text{Unreported \%}}{\text{Reported \% - Paid \%}}\right)$$

$$= 289\left(1 + \frac{1\text{-}0.8}{0.8\text{-}0.55}\right)$$

$= 520.2$ Unpaid

EXAMINER'S REPORT:

General Commentary

- Candidates were tested on actual vs. expected development concepts, as well as the IBNR to case outstanding reserving technique
- Approximately half of the candidates scored full credit on part a, and approximately one-third of candidates scored full credit on part b.
- For part b., a majority of the candidates were familiar with the formula, most of them citing it correctly. However, under 20% received full credit. Points deducted were usually based on incorrect calculations, use of wrong data (such as at the wrong evaluation age), or formulaic errors.
- Part a. required some thought, as it was backing into an original selection rather than starting with the selection and calculating a subsequent result. Part b. was a straightforward calculation, using an evaluation where all of the inputs had been supplied.

Part a

- The candidate was expected to know how to apply expected emergence to determine percent reported, which is a variation on standard actual vs. expected calculations
- Candidates were expected to use reported at 12 months, expected reported emergence for the 12-24 month period, and the current IBNR to solve for the percent reported at 12 months
- Candidates took a variety of approaches:
    - The sample answer (full credit)
    - An alternative approach in which they calculated percent of ultimate based on emergence of incurred losses to bring from A at 12 months to 80% at 24 months. This earned partial credit as it did not include any reference to IBNR
    - Another alternative approach which calculated based on difference between A and 80% using the selected ultimate. This earned partial credit as it was based on ultimate loss and not the IBNR.
    - A simple calculation of reported loss divided by ultimate loss – this scored minimal credit since it was using an ultimate selection to imply a percent reported rather than calculating a selected percent reported. In addition, it made the assumption that ultimate loss was based solely upon reported loss development
    - Typically, points deducted were predicated on the approach taken, with relatively few instances of calculation errors

Part b

- The candidate was expected to know the case outstanding development technique and be able to apply it. This was explicitly stated in the question.
- The candidate was expected to know the formula for the technique, and substitute the appropriate values.
- Common mistakes included:
    - Omitting the "+1" factor in the formula, in essence calculating IBNR and not unpaid
    - Calculating case outstanding incorrectly, either by using incorrect periods, using incremental 12-24 instead of cumulative, or some other method
    - Using incorrect development factors, particularly that at age 12 and not age 24
    - Attempting to solve the problem by replicating the tables in Friedland's Approach #1, but not recognizing the correct method of utilizing the Unpaid / Case Outstanding calculation