15. (2.75 points)

Given the following data as of December 31, 2013:

Accident Year	Earned Premium ($000)	On-level Earned Premium Factors	Reported Claims ($000)	Reported Development Factor to Ultimate
2010	1,100	1.35	700	1.10
2011	1,300	1.30	750	1.40
2012	1,400	1.20	500	1.70
2013	1,800	1.00	750	2.00

- Annual pure premium trend: 5%.
- Bornhuetter-Ferguson expected claims ratio: 57%.

a. (0.5 point)

Calculate the accident year 2013 IBNR using the Bornhuetter-Ferguson technique as of December 31, 2013.

b. (1.75 points)

Calculate the accident year 2013 IBNR using the Cape Cod technique as of December 31, 2013.

c. (0.5 point)

Briefly explain whether the Bornhuetter-Ferguson or the Cape Cod technique is more appropriate in the following scenarios:

i. Decrease in underlying claims ratio.
ii. Thin or volatile data.

EXAM 5 SPRING 2014 SAMPLE ANSWERS AND EXAMINER'S REPORT

QUESTION: 15

TOTAL POINT VALUE: 2.75 points

LEARNING OBJECTIVE(S): B3

SAMPLE/ACCEPTED ANSWERS:

Part a: 0.5 point

% unreported = 1 - ½ = 50%

.5 x .57 x 1800 = 513,000

Part b: 1.75 points

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Year	OLEP	%Rep	Used Up Premium (2) x (3)	Reported Claims	Trend	Trended Claims (5)x(6)
10	1100x 1.35 = 1485	91%	1350	700	1.05^3	810
11	1690	71%	1207	750	1.05^2	827
12	1680	58%	988	500	1.05^1	525
13	1800	50%	900	750	1.00	750
Total			4445			2912

ECR = 2912/4445 = 65.5%

IBNR = 1800 * .5 (% unreported) * .655 = 590,000

Part c: 0.5 point

- Cape Cod is better since it uses reported claims to derive the ECR, it will capture the change in the claims ratio, while B-F will not.
  or
- B-F is more appropriate as we can make a selection to account for the decrease in underlying claims ratio. The Expected Claims Ratio calculated by Cape Cod will be too high.

- B-F is better; if the data is volatile, it's better to use an a priori estimate of the claims ratio (B-F), rather than calculating ECR from the data (CC)

EXAMINER'S REPORT:

Part a

- Candidate was expected to know how to compute a B-F estimate for IBNR, given all the necessary inputs for the calculation.

- The majority of candidates scored full credit, with nearly all candidates scoring at least half of the points; overall candidates scored very well.
- All inputs needed for the calculation were given; no special assumptions or considerations related to the B-F method were present in the question statement
- Common mistakes included:
  - Calculation errors
  - Deriving ultimate loss instead of IBNR

Part b

- Candidate was expected to know how to compute a Cape-Cod estimate for IBNR, given all the necessary inputs for the calculation.
- Overall candidates scored well; approximately one-third received full credit, and nearly all candidates scored at least half of the available points.
- Candidates commonly struggled with being given a "Pure Premium" trend. Many applied the trend to Earned Premium.
- Most errors revolved around trend and loss development; candidates failed to trend losses, trended premium instead, or developed losses to ultimate. Less common was incorrectly selecting the ECR, calculation errors, and giving Ultimate Loss instead of IBNR. Even less common were mistakes with the concept of "Used-Up Premium"

Part c

- Candidate was expected to know whether B-F or Cape-Cod would yield better estimates of IBNR under two different scenarios
- The majority of candidates scored full credit, with nearly all candidates scoring at least half of the points; overall candidates scored very well.
- Scenarios were commonplace examples in CAS exam literature
- Candidates typically lost points for failing to provide enough support for the method selected