16. (2 points)

An insurance company with a book of business (Book A) has recently acquired a smaller book of business (Book B) in the same state and line of business. Given the following as of December 31, 2017:

Book A

Accident Year	Reported Claims ($000) as of (months)				Calendar Year	Earned Premium ($000)
	12	24	36	48		
2014	55,000	92,000	112,500	123,700	2014	175,200
2015	54,800	92,600	111,100		2015	179,400
2016	57,000	94,400			2016	182,800
2017	62,600				2017	184,200

75%	Book A expected claims ratio
1.06	48 to ultimate reported claim development factor

Book B

Accident Year	Reported Claims ($000) as of (months)				Calendar Year	Earned Premium ($000)
	12	24	36	48		
2014	2,600	5,900	6,700	7,500	2014	8,700
2015	3,500	4,300	6,000		2015	9,700
2016	2,600	2,700			2016	11,000
2017	4,400				2017	13,900

a. (0.75 point)

Calculate the Book A ultimate claims for accident year 2015 using the reported development technique.

b. (0.5 point)

Calculate the Book A ultimate claims for accident year 2016 using the Bornhuetter-Ferguson technique.

c. (0.25 point)

Calculate the Book A ultimate claims for accident year 2017 using the expected claims technique.

d. (0.5 point)

Recommend an approach for estimating ultimate claims for Book B in accident year 2015 without performing any calculations. Justify all assumptions.

QUESTION 16	
TOTAL POINT VALUE: 2	**LEARNING OBJECTIVES: B1, B3**
SAMPLE ANSWERS	

Part a: 0.75 point

Sample 1
LDF 36-48 = 123,700 / 112,500 = 1.1
CDF 36-Ult = 1.1 x 1.06 = 1.166
AY 2015 Ult Claims = 1.166 x 111,100 = 129,543

Sample 2

AY	12-24	24-36	36-48	48-Ult
2014	1.673	1.223	1.100	
2015	1.690	1.200		
2016	1.656			
Avg	1.673	1.211	1.100	1.06
CDF	2.362	1.412	1.166	1.06

Book A Ult Claims for AY 2015 = 111,100K x 1.166 = 129,495,490

Part b: 0.50 point

Sample 1

LDF	24-36
2014	1.2230
2015	1.1998
Avg	1.2114

CDF 24-Ult = 1.2114 x 1.166 = 1.412
% Unreported = 1 − 1/1.412 = 29.2%
AY 2016 Ult Claims = 94,400 + [182,800 x 0.75 x .292)] = 134,388

Sample 2
Book A Ult Claims for AY 2016 = 94,400,000 + [182,800,000 x 0.75 x (1 − 1/1.412)] = 134,394,206

Part c: 0.25 point

AY 2017 Ult Claims = 0.75 x 184,200 = 138,150

Part d: 0.50 point

Sample 1
Since B is in the same state and LOB as A, we can use the CDF in Book A to estimate ult claims for B in AY 2015, assuming the loss development pattern is the same.

Sample 2
B is small but given it's the same coverage/state as A, it makes sense to combine the data. A & B together would provide more credibility. With more data to make estimates more stable, I suggest the development technique, so it will be responsive to changes.

Sample 3
Given this is a small book of business and perhaps very correlated with book A (same state and same LOB), I think a B-F technique would work well, using the same ECR and CDF as book A.

Sample 4
Since it is a smaller company with same line and same state, we can directly use the expected claim ratio for book A to calculate book B.

EXAMINER'S REPORT

Candidates were expected to demonstrate the mechanics of the development technique, Bornhuetter-Ferguson technique, and expected claims technique. Candidates were expected to recognize the challenges of loss development with a small and volatile book of business and recommend and justify an appropriate technique in this situation.

Part a

Candidates were expected to calculate Book A ultimate losses for accident year 2015 using the reported development technique, including calculation of age-to-age and cumulative development factors.

Common mistakes include:
- Calculating ultimate losses for an accident year other than 2015
- Omitting the 48-ultimate reported development factor
- Using nonadjacent columns of the loss development triangle to calculate age-to-age factors

Part b

Candidates were expected to calculate ultimate losses for accident year 2016 using the Bornhuetter-Ferguson technique, including calculation of the % unreported and expected losses.

Common mistakes include:
- Using an age-to-age factor to calculate the % unreported instead of the cumulative development factor
- Calculating ultimate losses for an accident year other than 2016
- Using the % reported instead of the % unreported
- Calculating an expected claim ratio instead of using the given ECR

Part c

Candidates were expected to calculate ultimate losses using the expected claims technique.

A common error was calculating an expected claim ratio instead of using the given ECR.

Part d

Candidates were expected to recognize that Book B is small and volatile, so any development technique that relies on Book B's historical development pattern is inappropriate. Candidates were expected to recommend and justify a specific alternative approach. For recommended techniques using Book A, candidates were expected to state the Book A is appropriate to use since A and B operate in the same state and line of business.

Common mistakes include:

- Recommending a technique using Book B's historical development pattern
- Providing a recommendation with no justification
- Recommending a technique using Book A without stating why A is appropriate to use
- Recommending use of an "appropriate" expected claims ratio for Book B without making a recommendation for how to select one (e.g. using industry data)
- Attempting to diagnose a change in case reserve adequacy and recommending a Berquist-Sherman adjustment