19. (3.25 points)

Given the following information:

Accident Year	Reported as of December 31, 2012		Payroll ($000)
	Claim Counts	Severities	
2010	1,549	$22,418	$63,438
2011	1,455	$18,730	$62,893
2012	1,023	$12,501	$67,005

As of Month	Reporting Patterns (Reported %)	
	Claim Count	Severities
12	85.0%	43.0%
24	95.0%	67.0%
36	98.0%	83.0%

- The reported claim counts for accident year 2012 are unusually low due to a temporary slowdown of claims being opened.
- Annual frequency trend = -2%.
- Annual severity trend = +5%.
- Annual payroll trend = +4%.

Use an appropriate frequency-severity technique to estimate the IBNR for accident year 2012 at December 31, 2012 and justify all selections.

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Exam 5 Question #19

Because 2012 frequency is off, severity is probably also impacted (smaller claims open faster), so 2012 will not be used in the calculation.

	Counts	CDF	Trend	Trend +Dev counts (a)
2010	1549	1/.98	$.98^2$	1518.02
2011	1455	1/.95	.98	1500.95

	Sev	CDF	Trend	Trend+ Dev sev (b)
2010	22418	1/.83	$(1.05)^2$	29778.13
2011	18730	1/.67	1.05	29352.99

Exposure	Trend		Trended Exp (c)
63438	$(1.04)^2$	=	68614.54
62893	(1.04)	=	65408.72

Trended PP $\frac{((a)\cdot(b))}{(c)}$

2010 658.81

2011 673.57

Sel avg 666.19

ULT 2012

= Sel PP x payroll($100)

666.19 x 67005=44638060.95

IBNR= 44,638,060.95 – (1023) x 12501

= $31,849,537.95

OR

ULT claims	Trended		Trended Payroll
1549/0.98	1.0192^2	= 1642	63,438 x $1.04^2 = 68{,}615$
1455/0.95	1.0192^1	=1561	$62{,}893 \times 1.04^1 = 65{,}409$
1023/0.85	1.0192^0	=1204	$67{,}005 \times 1.04^0 = 67{,}005$

Freq trend= Claim Trend / Payroll Trend = 0.98 = 1.0192 / 1.04

2010 Freq = 1642/68,615= 0.0239

2011 Freq= 1561/65,409= 0.0239

= Sel 0.0239

ULT trended Severity

22,418/ 0.83 $\times\ 1.05^2 = 29{,}778$ →All Average Sel= 29,401

18,730/0.67$\times\ 1.05 = 29{,}353$

12,501/0.43$\times\ 1.00 = 29{,}072$

0.0239$\times\ 67{,}005 \times 29{,}401 = 47{,}083{,}335\ Ult$

47,803,335$-\ 1023 \times 12501 = 34{,}294{,}812\ IBNR$

Selected Frequency based on 2010 + 2011 because 2012 had a slowdown in claim counts, making it project an inaccurately low ULT claim count.

Severity is still reliable because it is an average number i.e. volume is controlled for Used an all years average for stability.

OR

	Ultimate Claims	Trended Exposure	Frequency
2010	1549 / .98 = 1580	63,438 x 1.04^2	2.30%
2011	1455 / .95 = 1532	62,893 x 1.04	2.34%

Trended Frequencies

2010 $.023\ (.98)^2 = .0221$

2011 $.0234(.98) = .0229$

Simple Average = .0225 = Selected Freq

	Ultimate Severity	Trended Ut sev
2010	$\frac{22418}{.83} = 27010$	29,779
2011	$\frac{18730}{.47} = 27955$	29,353
2012	$\frac{12501}{.43} = 29{,}072$	29,072
		Simple average= 29,401

Ultimate Claims= 29,401 x .0225 x 67,005

= 44,325,315

IBNR= 44,325,315 - 1,023 · 12,501= 31, 536,792

Since AY 2012 claim counts were subject to an temporary slowdown they were removed from the calculation of the ultimate frequency because using the current report patterns would severely underestimate ultimate freq. for that year. Severity was assumed to be unaffected since there was no mention of a change in claim department methodology, just a slowdown in opening all claims.

"thin" data. Credit was not given for candidates that referenced the other case outstanding method (references to claims made policies).

18.

a. The majority of candidates received full credit. Those that didn't receive full credit typically lost points because they didn't differentiate between total claim versus unreported/unpaid claim.

b. The majority of candidates received full credit. Those that didn't receive full credit were often mentioning the credibility calculation but were not mentioning to which method this factor would apply. Another common mistake was to weight Z with [Actual loss / reported / paid] instead of [Development Method Ultimate Loss/ reported / paid]

c. The majority of candidates did not receive full credit. A common mistake for candidates was that they were mentioning situation where BF method was not appropriate instead of referring to a situation where credibility weighting assumption itself of BF method was not appropriate.

d. The majority of candidates did not receive full credit. Most of the candidate identified the right method, but only a few had a clear explanation on why the reported method was more appropriate.

e. Most candidates received full credit on this part.

19. Candidates generally performed well on the calculation portion of this question.

Some candidates did not calculate frequency (claim counts / payroll) and simply multiplied the average of 2010 and 2011 claim counts by a severity selection to determine 2012 ultimate claims. This does not account for the 2012 exposure levels and was not awarded full credit.

Some candidates calculated the ultimate loss indication correctly and subsequently lost points by failing to calculate the indicated IBNR associated with the ultimate loss. A small portion of candidates calculated the IBNR for all 3 accident years rather than just 2012.

Some candidates did not justify their selections, as specified in the question. Additionally, a portion of candidates simply wrote out their selection in words; for example, writing "select average of 2010 and 2011" does not constitute a justification and did not receive credit.

There were some candidates that spent time converting the percentage reported factors to loss development factors and subsequently multiplying by the claim counts and severities. The mathematical equivalent of dividing by the percentage reported could have saved the candidates time. A smaller portion of candidates used the percentage reported figures to create triangles of counts and severities that were unnecessary and subsequently not used in their solution.

Common mistakes included:

- Not using trend factors
- Not using loss development factors
- Applying loss development factors or trend factors to the incorrect year (for example, applying the 36-month factor to 2012 rather than 2010)
- Assuming that the inverse of the given percentage reported factors were age-to-age factors rather than age-to-ultimate factors

20. Candidates were supposed to evaluate Average Paid (and/or Outstanding) and Average Reported trends and compare them to the known severity of 5%. They should have noticed the increase in paid settlement and that reported trends matched the 5% severity. From there they were to conclude to use the reported method and not the paid. This conclusion should have been reached by evaluating changes (or lack of change) in both case adequacy and settlement rates.

Many candidates calculated Average Paid and Average Case severities, but did not calculate the Average Reported severities. Most candidates did calculate trend from year to year. Many of those lost credit by not making any statement on the stability or instability of the resulting trends. Also, comparisons of the observed paid severity to the outstanding severity, or the observed severities along the diagonal rather than down the columns of the triangle did not receive full credit.

Many candidates that only looked at average paid and case decided the change in trend of the case outstanding disproved using the reported method. But case alone is inconclusive in determining reported stability. Many of those candidates did not test for settlement rate changes, likely with the thought that they had identified the relevant piece of information to make their choice. Some candidates further went on to test the settlement rate but did not see how an apparent case adequacy change is influenced by a real settlement rate change.

Those that did calculate Average Reported often noticed that the year to year trend was stable and some of those mentioned that the trend was consistent with the 5% severity.

A large number of candidates went off onto a Berquist-Sherman technique or an "adjusted" reported methodology which was incorrect as the reported method without adjustment is the preferred method.

Full credit for the selection of the reported method was given if the correct choice was made or even if the words "select the reported method" and no numerical choice was made. If the candidate mistook the reported ultimate for incurred and then applied an LDF, or created their own LDF instead of using the ultimate given, full credit was still awarded. If they adjusted the reported triangle using a BS or other methodology and then developed to ultimate, no credit was given for selecting the reported method.

The question asked the candidates to choose between the paid and reported methods. Some candidates choose an average of them and got a number "Between." Since the reported was accurate and the paid was not candidates did not receive full credit.

21.