17. (2.75 points)

Given the following information for an insurance company:

Calendar/ Accident Year	Earned Car Years	Earned Premium ($000)	Reported Claims ($000)	Selected CDF
2011	830	415	315	1.05
2012	1,000	450	392	1.10
2013	1,000	475	358	1.30
2014	700	280	200	2.00

- The company first started writing business in 2011.
- The mix of business has not changed.
- Significant rate changes have occurred over the past four years.
- Policies are annual and are written uniformly throughout the year.

Calculate the IBNR for accident year 2014 using the Cape Cod technique, incorporating adjustments for claims trend and on-leveling of premium. Justify the selection of claims trend.

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EXAM 5 SPRING 2015 SAMPLE ANSWERS AND EXAMINER'S REPORT

QUESTION: 17

TOTAL POINT VALUE: 2.75

LEARNING OBJECTIVE(S): B3

SAMPLE/ACCEPTED ANSWERS:

Sample 1:

TREND SELECTION

Policy Year	Earned Car Years	Reported Claims (000's)	Selected CDF	Development Ultimate	Pure Premium	Year Over Year Trend
2011	830	315	1.05	331	399	
2012	1000	392	1.1	431	431	1.080
2013	1000	358	1.3	465	465	1.079
2014	700	200	2	400	571	1.228

I recommend a trend of 8%. I'm not including the 22.8% because that year is very immature/ highly leveraged.

ONLEVEL

Policy Year	Earned Premium	Average Rate per Exposure	AY 2014 Rate Per Exposure	Onlevel Premium
2011			400	332
2012			400	400
2013			400	400
2014	280	400	400	280

CAPE COD METHOD

Policy Year	Onlevel EP	CDF	Used Up Premium	Trend to AY 2014	Trended Reported	Adjusted ELR
2011	332	1.05	316	1.260	397	1.260
2012	400	1.1	364	1.170	459	1.260
2013	400	1.3	308	1.080	387	1.260
2014	280	2	140	1	200	1.430
		Totals:	**1128**		**1443**	

ELR = 1,443 / 1,128
= 1.279

IBNR = 1.279 * 280 * (1 – ½)
= 179.06 (000s)

Sample 2:

TREND SELECTION

Policy Year	Earned Car Years	Reported Claims (000's)	Selected CDF	Development Ultimate	Pure Premium	Year Over Year Trend
2011	830	315	1.05	331	399	
2012	1000	392	1.1	431	431	1.080
2013	1000	358	1.3	465	465	1.079
2014	700	200	2	400	571	1.228

Recommend a trend of 8%. Exclude 22.8% because the year is very immature.

CAPE COD METHOD

Policy Year	Earned Car Years	CDF	Used Up Exposure	Trend to AY 2014	Trended Reported	Adjusted ELR
2011	830	1.05	790	1.260	397	0.500
2012	1000	1.1	909	1.170	459	0.500
2013	1000	1.3	769	1.080	387	0.500
2014	700	2	350	1	200	0.570
		Totals:	2818		1443	

ELR = 1,443 / 2,818 = 0.512

IBNR = 0.512 * 700 * (1 – ½) = 179.2 (000s)

EXAM 5 SPRING 2015 SAMPLE ANSWERS AND EXAMINER'S REPORT

EXAMINER'S REPORT:

The question combined topics from different parts of the syllabus. Overall candidates did fairly well on this question, though few scored full credit.

The most common error was to neglect to develop the losses to ultimate when deriving the pure premiums. Many candidates also struggled to provide clear justifications on why the particular trend was selected.

Most candidates were able to bring the premiums to the current level using the Extension of Exposures technique. Candidates also did well in the Cape Cod component, and were able to derive an ELR and the resulting IBNR.

Note that approaching this question by using an exposure-based technique was also acceptable; as premium cancels out in the calculation, using exposure in place of on-level premium achieves the same result.