Tutorial 2 - Projecting Ultimate Claims

1. Given that a company has 40 open claims as of Dec 31, 2000. Each claim has case reserve of $6,250 and the following is a breakdown of activity on these claims during the 2001 calendar year.

   - 5 claims closed with total payment of $80,000;
   - 5 claims closed without payment;
   - 5 claims with partial payment of $2,500 each, with a corresponding reserve decrease on each claim of $2,500;
   - 5 claims with partial payment of $5,000 each, with each of these 5 claims having a case reserve increase to $10,000;
   - 20 claims remain open with no payment or reserve activity;
   - Received unanticipated salvage and subrogation recoveries amounting $5,000 in total.

   What is the reported claims for these 40 claims for calendar year 2001?

2. You are given the following information about two LOB:

   - Commercial Auto PD Reported Claims:

AY	12 Months	24 Months	36 Months	48 Months
2006	10,000	14,000	16,800	18,480
2007	15,000	21,000	25,200	
2008	20,000	28,000		
2009	25,000			

   - Personal Auto PD Reported Claims:

AY	12 Months	24 Months	36 Months	48 Months
2006	10,000	12,000	13,200	13,332
2007	11,000	13,200	14,520	
2008	12,000	14,400		
2009	13,000			

   Based on the data above, comment on whether we should combine these two LOB and provide two reasons for it.

3. Given the following information:

Transaction Date	AY	Incremental Paid
Dec 31, 2008	2008	$1,000
Dec 31, 2008	2007	$500
Dec 31, 2008	2006	$100
Dec 31, 2008	2005	$50
Dec 31, 2007	2007	$1,500
Dec 31, 2007	2006	$600
Dec 31, 2007	2005	$150
Dec 31, 2006	2006	$1,500
Dec 31, 2006	2005	$400
Dec 31, 2005	2005	$1,100

AY	12m	24m	36m	48m
2005	1,100	1,500	1,650	1,700
2006	1,500	2,100	2,200	
2007	1,500	A		
2008	1,000			
LDF	B	1.069	1.030	1.000

(a) Suppose that the LDF above is computed using weighted average, find the value for B.

(b) Find the unpaid claim liability for accident year 2008 as of Dec 31, 2008.

4. You are given the following data of reported claims:

AY	EP	12m	24m	36m	48m
1994	11,000	3,575	5,363	6,328	6,961
1995	12,000	4,200	6,300	7,434	
1996	13,000	4,875	7,313		
1997	14,000	5,600			

(a) Calculate the estimated IBNR using reported claim development technique. Assume that the tail factor is 1.027.

(b) Using Expected method, compute the estimated IBNR is the expected loss ratio is 65%.

(c) For the two methods above, which one is a better method? Justify your answer.

5. Given the following data:

AY	EP	Cum. Paid	CDF
2008	2,600	1,600	1.000
2009	2,800	1,700	1.050
2010	2,700	1,400	1.155
2011	2,600	1,000	1.520

Loss Ratio Trend = 0% and Case Reserve for AY2011 as of Dec 31, 2011 is $780. Using Expected method, compute the estimated IBNR for AY2011.

6. Given the following information as of Dec 31, 2010:

AY	EP	Paid	On-Level EP Factor
2007	21,000	11,700	1.093
2008	22,050	8,200	1.061
2009	23,152	4,900	1.03
2010	23,525	1,900	1

	1-2	2-3	3-4	4-5	5-ult
Paid LDF	2.40	1.80	1.50	1.20	1.02

Loss Ratio Trend = 4%

(a) Using expected method, estimate the ultimate claims for accident year 2010.

(b) State one disadvantage of the expected claim technique.

7. You given the cumulative claims paid and earned premium data:

AY	EP	12m	24m	36m	48m
1992	19,500	4,621	9,450	13,710	15,723
1993	20,000	4,453	9,060	12,988	
1994	20,800	5,106	10,100		
1995	21,000	5,242			

Assume that the tail factor is 1.050 and ELR is 85%. Calculate the total outstanding claims as of 31 Dec, 1995 based on the BF method.

8. You are given the following data for a line of business:

AY	EP	12m	24m	36m	48m
1995	1,200	300	600	750	825
1996	1,400	400	800	1,000	
1997	1,500	500	1,000		
1998	2,000	600			

An actuary has assumed that there is no development after 48 months and the estimated ultimate claims using BF method is $4,725. Find the ELR underlying the calculation, assuming that all AY have the same ELR.

9. Identify one situation in which it would be preferable to use the BF method rather than the reported claims Chain Ladder method to estimate ultimate claims.

10. Identify one situation in which it would be preferable to use the reported claim Chain Ladder method rather than the BF method to estimate ultimate claims.

11. Given the following information:

AY Year	Projected Ultimate Severity using Chain Ladder Method
2014	7,800
2015	8,400
2016	8,900
2017	9,200
2018	8,500

- The annual severity trend is 5%;
- Accident year 2017 ultimate counts are 1,300;
- Accident year 2018 ultimate counts are 1,200.

Estimate the ultimate claims for accident years 2017 and 2018.

12. Given the following information:

Reported Claim Counts:

AY	1	2	3	4
2016	240	300	420	450
2017	300	420	444	
2018	360	372		
2019	420			

Reported Claims ('000):

AY	1	2	3	4
2016	1,200	1,800	2,640	3,120
2017	1,320	2,280	2,760	
2018	1,500	2,070		
2019	1,700			

- The tail factor for claim counts is 1.01
- The tail factor for reported severity is 1.02
- The selected annual frequency trend is +2.0% for 2016 to 2019
- The selected annual severity trend is -1.5% for 2016 to 2019
- Use wighted averages to compute LDFs
- Exposures have been constant and there is no exposure trend

Estimate the IBNR for AY2019.