

Loss Development Methods

For Association of Insurance Compliance
Professionals (Of the Mid-west)

Jim Shoenfelt, ACAS

Loss Development Methods

Who cares? Why Care?

- compliance professionals report developed losses.
- the more you know, the better?
- Confound your regulator/actuary friends with questions like, “The developed losses shown here - is that based on Bornhuetter-Ferguson-type development? If so, what’s the Expected loss ratio that you’ve selected – and where’dja come up with that?” (... or NOT!)

Loss Development

Common Misconceptions

- 1. Loss Development refers to estimating the amount of losses that have not yet happened**
- 2. There are many wrong, but only one correct way to develop losses.**
- 3. Loss development refers to adjusting losses for trend or “inflation”**

So, What *IS* loss development?? And how can we estimate / predict how losses will develop?

Loss Development Methods

1. The Expected Loss Ratio Method
2. The traditional method a.k.a. the “chain ladder” method
 1. The triangle
3. The Bornhuetter-Ferguson
4. Brosius method

Loss Development Methods

The Expected Loss Ratio Method

		<i>EP</i>	<i>ELR</i>	<i>Ultimate Developed Loss</i>
AY	2000	400	75%	300
	2001	500	75%	375
	2002	600	75%	450
	2003	800	75%	600

$$375 = 500 \times 75\%$$

Loss Development Methods

The Expected Loss Ratio Method

1. Truth stranger than fiction: This is a “real” method!

Advantages

1. Simple
2. New lines of business

Disadvantages:

- How do you determine the ELR?
- How do you adjust the method as the losses develop and show the ELR to be more and more unlikely?

Loss Development

Basic Loss Components

- Paid
- Case Reserves
- Bulk Reserves
 - Pure IBNR
 - Development on existing reserves
- You can see these components “in action” on the first page of your company’s schedule P.

Loss Development

Accident Year Data

- Accident year losses – the losses that happened during a 12 month period.
- Policy Year losses – the losses associated with policies written during a 12-month period
- Calendar Year Losses – the losses paid or loss reserve changes made during a 12-month period.

For simplicity: we'll limit our discussion to paid cumulative Accident Year development

Loss Development Methods

Cumulative Paid Loss Triangle

		Lag (in months)			
		12	24	36	48
AY	2000	100	200	300	300
	2001	125	250	375	
	2002	150	300		
	2003	200			

For ACCIDENTS that happened during 2001, \$250 was PAID in total by year-end 2002.

Loss Development Methods

The traditional a.k.a. Chain-ladder method

		Lag (in months)			
		12	24	36	48
AY	2000	100	200	300	300
	2001	125	250	375	
	2002	150	300		
	2003	200			

$$1.50 = \frac{(375+300)}{(250+200)}$$

Selected Link Ratio	2.00	1.50	1.00
Selected Loss Development Factor (To Ultimate)	3.00	1.50	1.00

$$3.00 = 2.00 \times 1.50 \times 1.00$$

Loss Development Methods

The traditional a.k.a. Chain-ladder method

		Lag (in months)			
		12	24	36	48
AY	2000	100	200	300	300
	2001	125	250	375	375
	2002	150	300	450	450
	2003	200	400	600	600

Selected Link Ratio	2.00	1.50	1.00
Selected Loss Development Factor (To Ultimate)	3.00	1.50	1.00

Loss Development Methods

Chain Ladder Method

Advantages

1. It's objective. It doesn't work off a subjective ELR. Regulators and IRS may prefer methods with less "actuarial judgment"
2. Unlike the Expected loss ratio method, as losses develop and time passes, the estimate gets closer to reality

Disadvantages

1. The relationship between losses at different development periods may not be multiplicative.
2. It will be distorted by changes in claim payment patterns. (E.g. If Claims personnel start to pay losses faster, then this method overstates the developed losses.)
3. If no losses have been paid yet for a given accident year, the method predicts ultimate losses of 0.

Loss Development Methods

Chain-ladder method: Problem with Speed up in Claim Payments

		Lag (in months)			
		12	24	36	48
AY	2000	100	200	300	300
	2001	125	250	375	375
	2002	150	300	450	450
	2003	250	500	750	750

Selected Link Ratio	2.00	1.50	1.00
Selected Loss Development Factor (To Ultimate)	3.00	1.50	1.00

Loss Development Methods

Bornhuetter-Ferguson

These guys saw advantages of both the chain-ladder and the expected loss ratio method. So, they developed a method that is somewhat in between.

Loss Development Methods

Bornhuetter-Ferguson

The Basic Idea:

The developed losses = What is actually paid + What we would expect to develop if the Expected Loss ratio is correct.

Loss Development Methods

Bornhuetter-Ferguson Method

				Lag (in months)				
		EP	ELR	12	24	36	48	Ult.
AY	2000	400	75%	100	200	300	300	300
	2001	500	75%	125	250	375		375
	2002	600	75%	150	300			450
	2003	800	75%	200				600

Selected Link Ratio	2.00	1.50	1.00
Selected Loss Development Factor (To Ultimate)	3.00	1.50	1.00
1 – (1/Above Row)	0.67	0.33	0.00

$$450 = 300 + 600 \times 75\% \times 0.33$$

$$= \text{Actually paid} + \text{Should pay}$$

Loss Development Methods

Bornhuetter-Ferguson Method

Advantages

1. A happy combination of the other two methods.
2. The expected loss ratio is less important as your experience develops and your experience is more important as it develops

Disadvantages

1. It is still affected by changes in claim practices (e.g. claim personnel starts to pay claims faster).

Loss Development Methods

Brosius Method

Now for something totally different...

To the Spreadsheet

Loss Development Methods

Thank you!

Jim Shoenfelt, ACAS

Jim@ShoenfeltConsulting.com

(216) 244-4295