Developing Losses 10M

Once loss data is aggregated, the data needs to be developed from the current values to the ultimate values. To do this, pricing actuaries need to calculate and select age-to-age loss development factors and apply them to loss data to obtain ultimate losses. As seen in Section S5.1, developing losses is also useful for estimating reserves. So, it is a good idea for pricing actuaries to consult reserving actuaries when developing losses.

One way to develop losses is to use the chain-ladder method, which was discussed in Section S5.1. Let's review that method with an example that incorporates a data aggregation step not included in Section S5.1.

Example S5.2.2.1

You are given the incurred losses at different dates for multiple accident years.

Accident Year	Incurred Losses as of		
	12/31/CY2	12/31/CY3	12/31/CY4
AY1	300,000	390,000	390,000
AY2	320,000	339,200	373,120
AY3	-	420,000	478,800
AY4	-	-	450,000

Assume losses do not develop after three years.

Calculate the ultimate losses for AY4 using the chain-ladder method and the average factor model.

Solution

Note that **incurred losses as of** is the same as **cumulative incurred losses**. However, the loss data is not organized in the format shown in Section S5.1. In particular, the losses are organized by calendar year instead of by development year. So, let's rearrange the loss data.

Accident Year	Development Year			
	0	1	2	3
AY1	-	300,000	390,000	390,000
AY2	320,000	339,200	373,120	-
AY3	420,000	478,800	-	-
AY4	450,000	-	-	-

The age-to-age factors are:

Accident Year, i	$f_{i,1}$	$f_{i,2}$	$f_{i,3}$
AY1	-	1.30	1.00
AY2	1.06	1.10	-
AY3	1.14	-	-

Based on the average factor model, the selected age-to-age factors are:

f_1	f_2	f_3
1.1	1.2	1.0

Then, the estimated ultimate losses for AY4 are:

$$\begin{aligned}\hat{L}_{\text{AY4}}^{\text{ult.}} &= 450{,}000\,(1.1)\,(1.2)\,(1.0) \\ &= \mathbf{594{,}000}\end{aligned}$$