

Bruin Mutual

Executive Summary

Team 12

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In order to more adequately monitor Bruin Mutual's reserve review for three lines of business, we established tools and processes to ensure accuracy and efficiency in the reserving process. We constructed annual cumulative reported dollar triangles, paid dollar triangles, annual cumulative reported claim count triangles, and paid claim count triangles. We employed these triangles to commute several reserving method calculations. We believe that the below recommendations could help Bruin Mutual to standardize the reserving process as well as estimate the ultimate loss accurately and contribute to profitable growth.

Assumption

While conducting the annual cumulative paid dollar triangles, we disregarded cases that are still open for the purpose of acquiring more accurate historical data. To complete some of the triangles, we assumed there are no new developments for the Personal Auto Physical Damage business 4 years after the accident year. We also presupposed that there are no further developments 3 years after Physdam, 7 years after liability, and 5 years after for homeowner. We also made the assumption that the loss ratio of the first year would be the same for other years when conducting the expected method given that the ratio of unsettled cases gradually rose throughout each accident year. Lastly, we suggested that there were no major catastrophes (CAT)¹ occurring in the past 8 years that impacted our reserving process.

Analysis and recommendation of reserving practices

After obtaining the different triangles, we employed several reserving methods and conducted analysis for each line of business.

¹ CATs are infrequent and volatile, producing no loss in most years and a large loss in certain years. Additionally, each CAT exposure is likely correlated, while non-CAT exposures are not usually correlated. Bruin Mutual must either find a way to bear the costs of holding a large reserve or create a CAT risk management plan to deal with its existing exposure. Thus, there needs to be a unique reserving process for CAT.

Such an event also presents unique challenges to the reserving process such as restricted access to Location and disruption in communication. As time passes, complications may arise with the foreign exchange rate that can lead to a negative impact on Bruin Mutual's corporate currency. Lastly, such events may present significant hurdles for financial reporting, particularly on the cusp of a quarter or year-end.

Homeowner's property

We noticed a significant drop on the reported chain ladder after the Accident year (AY) 2015 (Figure 1). The average initial reserve is much higher for AY 2011-2015 than the average initial reserve of AY 2016-2020 (47k compared to 28k). We believe this was due to some change in initial reserve practices in Bruin Mutual. Additionally, we addressed another significant drop after AY 2019 for the paid chain ladder as more than half of the reported claims in AY 2020 are still open. Therefore, in an attempt to balance different methods and keep the ultimate loss selection process consistent, we calculated the ultimate loss by using the simple average ultimate loss of the paid chain ladder, Bornheutter-Ferguson, and Cape Cod methods for AY 2011-2019. For AY 2020, we omitted the paid chain ladder method and took the average of the Bornhuetter-Ferguson and Cape-Cod methods.

We ultimately recommended the homeowner's property line of business be standardized with the Bornheutter-Ferguson method to minimize potential reserving risks. Based on the profit table (Figure 2), the homeowner line of business includes the largest amount of profit. In addition, auto liability has an insatiable paid loss each year (Figure 3). Since the development triangles for the homeowner's property line of business presented a reasonable development pattern, the Bornheutter-Ferguson method has the advantages laid out above. Given the limited information provided, we cautiously decided to choose a method that would provide a more stable reserve.

Personal Auto Physical Damage (Physdam)

From the data, all closed cases for physdam were settled within 4 years after the AY. Thus, when obtaining our initial reserves, challenges arose due to the lack of available data. We made the assumption there aren't any developments three years after each AY in order to proceed with our reserving process. A similar deviation was observed in AY 2020 on the paid chain ladder method for the same reason noted above. After analyzing the different methods and erring on the side of caution, we used the average ultimate loss (Figure 4) of the different reserving methods we employed when selecting an ultimate loss for AY 2011-2017. For AY 2018-2020, we selected the ultimate loss predicted by the loss ratio of the expected method only as we have insufficient historical data available.

Personal Auto liability

We noticed that across methods, Personal Auto liabilities had the most volatile ultimate loss (Figure 3). The paid amount could vary greatly from year to year. Therefore, we need a more thorough approach to obtain the reserve. We first omitted the expected method because it performed very differently from the other methods. For AY 2011, we choose the paid chain ladder since we have robust data available to us. For AY 2012-2015, we select the ultimate loss by taking the average ultimate loss of the paid chain ladder, Bornheutter-Ferguson, and the Cape Cod method. For AY 2017-2020, we select Bornheutter-Ferguson as it is more responsive at mature (more data) years and remains stable in immature years.

Figures

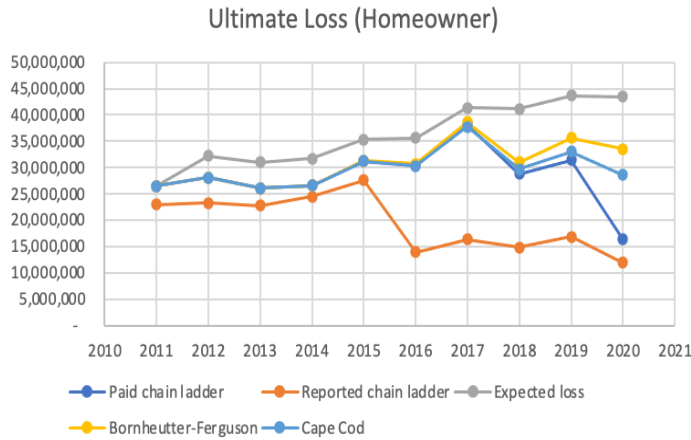


Figure 1. Ultimate Loss Summary (Homeowner)

Profit table			
	Homowner	Physdam	Liability
Premium (mil \$)	457.4	80.4	90.6
Selected UL (mil \$)	301.2	32	63.8
Profit (mil \$)	156.1	48.4	26.8
Profit Rate (Profit/Premium)	34.13%	60.20%	29.58%

Figure 2. Profit Table

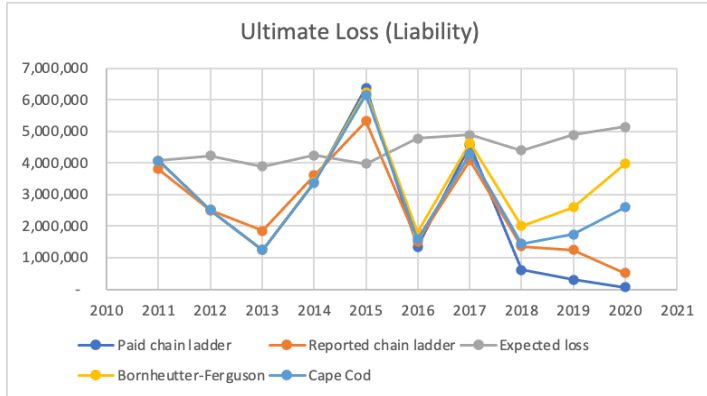


Figure 3. Ultimate Loss Summary (Auto Liability)

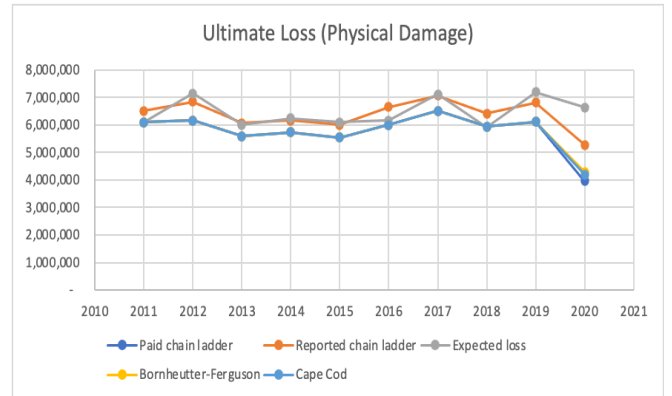


Figure 4. Ultimate Loss Summary (Auto Physdam)

Ultimate loss table				
	Homeowner (mil \$)	Physdam (mil \$)	Liability (mil \$)	Total (mil \$)
2011	26.5	20.5	4.1	51.1
2012	28.1	28.1	28.1	84.3
2013	26.1	21.2	26.1	73.4
2014	26.6	6.2	26.6	59.4
2015	31.2	6.1	31.2	68.5
2016	30.4	6.2	26.3	62.9
2017	38.2	7.1	32.8	78.1
2018	29.8	5.9	2	37.7
2019	33.3	6.2	2.6	42.1
2020	31	6.6	4	41.6
Total	301.2	114.1	183.8	599.1

Figure 5. Ultimate Loss Summary