

Block Dental

Executive Summary

Actuarial Team 25

Bryan Le, Joey Pai, Priscilla Tsai, Yuka Kozakai

Brief Overview

The Block Dental actuaries created a study about different groups of clients and their loss ratios. Using the band intervals provided, we analyzed the data based on loss ratio, net dental renewal increase, and average group size. With these groupings, we considered two strategies: maximize profit through raising the premium cost of groups with high loss ratios by large increments and the other was maximize revenue through raising the premium cost of groups with high loss ratios by small increments. The results of this study were used to determine the renewal rate increases for each group based on the bands. Ultimately, these renewal increases decrease the current loss ratio of around 88% down to 70% within three years.

Methodology

We first define loss ratio as claims divided by premiums and win rate as win cases over total cases. We would like to set specific rate increases for high loss ratio groups. By creating a probability model that considered the factors 1. loss ratio and 2. renewal rate increase, we calculated individual win rate and were able to determine premium rate increases in each combination of the two factors that would not deter too many clients from renewing their contracts. Afterwards, we could build our strategies based on this model to determine how we could manipulate renewal increase to increase revenue and profit. For exact probability figures please refer to graph 1.

Implications

Collecting data about the clients' reactions to increases and decreases in premium prices throughout the three-year span would add to the predictive accuracy of our probability model. In considering the strategy where we maximize profit through increasing premium by large increments, we had limited data about the result of changing the renewal rate to higher levels. We also recommend studying the effects of decreasing the breadth of insurance coverage in order to decrease claim costs.

When averaging the loss ratio by state, each state's loss ratio was above 75% so we did not include states as a variable to our probability model for efficiency considerations. However, increasing company presence in certain states could improve the overall loss ratio. In terms of

improving our probability model, we believe the addition of states as a variable could enhance our probability model.

In addition, we assumed that the annual demand for dental insurance remains consistent. Another assumption that we did not include in our figures was the inflation rate.

Recommendations

Based on the study, there were two primary ways to decrease the loss ratio:

1. Raising the premium cost by **large** increments for groups with high loss ratios: Through this strategy, the revenue for premiums will increase as the claims for groups with a high loss ratio would decrease. Consequently, this method maximizes profits at the expense of losing some of the customers with a high loss ratio.
2. Raising the premium cost by **small** increments for groups with high loss ratios: Through this strategy, the premium total would increase at a higher rate while claims would grow at a proportional rate based on the increase in the number of customers. Thus, the company would be maximizing revenue. We would increase the premium rate by the calculated optimal amount to not lose any customers while increasing revenue.

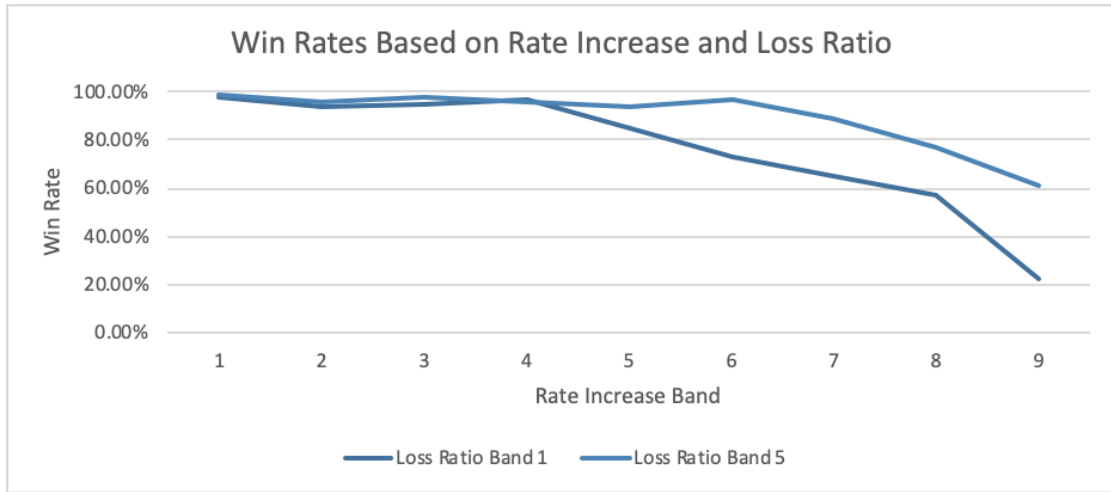
In choosing between these methods, we decided to implement a combination of both strategies. For groups with loss ratio of above 0.7, we used strategy 1, and for groups with loss ratio of below 0.7, we used strategy 2. For exact percentage figures please refer to graph 2.

For groups with loss ratio of above 0.7, we decided to increase the premium cost by large increments because we found that losing some customers would still result in an increase in profit because of the detrimental high claim cost those customers have. As for groups with loss ratio of below 0.7, we decided to increase the premium cost by small increments, which happens to be the calculated optimal amount, because it would allow us to maximize revenue from these groups of clients without losing them. For loss ratio prediction please refer to graph 3.

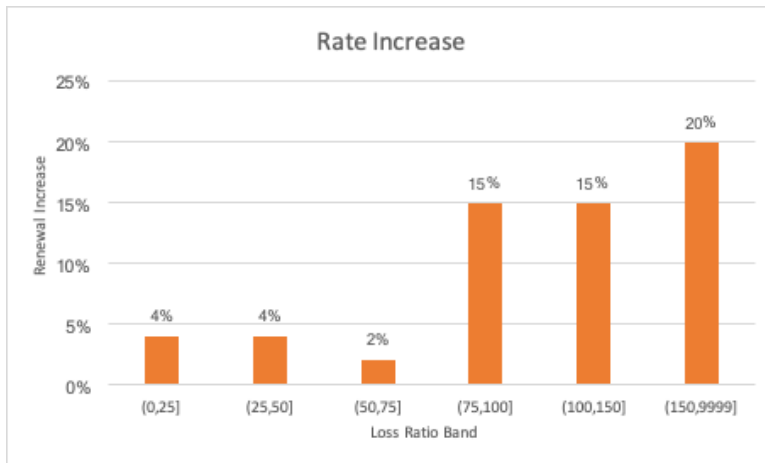
Therefore, we concluded that implementing a mix of these two strategies would decrease expenses from claim costs while retaining the customers with low loss ratios. In doing so, both profit and revenue will be maximized, which would bring the company earnings that can ultimately be funneled to invest in advertising and expansion.

Tables and Figures

Graph 1: Profit Probability Model (only retrieved loss ratio band 1 and 5)



Graph 2: Rate Increase for the Combined Strategy



Graph 3: Loss Ratio Prediction for Combined Strategy

