At MSBA204 we have used real data from SuperStar to build a linear model that measures the efficiency of fund allocation to potential customer impressions.

Using our model, we can conclude how to allocate the funds of the advertising budget to maximize the customers we can reach. We will attempt to explain our insights without the use of technical jargon.
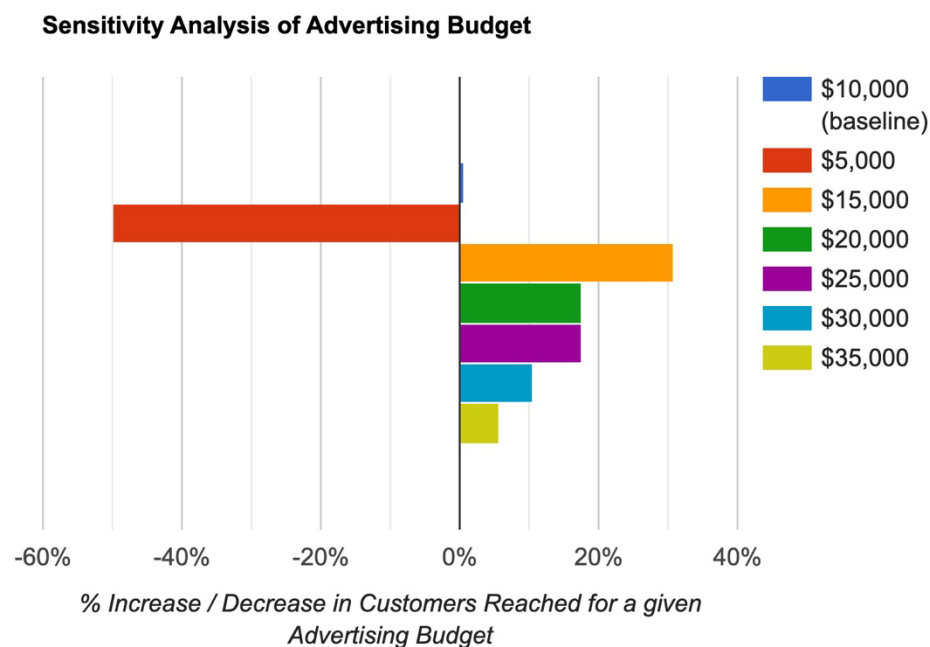
First, we'd like to mention that without conducting a linear programming analysis, SuperStar might be inclined to throw as much money into advertising as is feasible at any given time. This is not the ideal method for fund allocation as it can lead to over-budgeting and diminishing returns to scale.

Our end-goal with our analysis was to find the exact point of balance where as advertising budget increased, the additional percentage of potential customers increased monotonically in tandem. This would be our optical budget proven with real data.

SuperStar has indicated that their weekly budget is $10,000 for online advertisement. Using this information we have concluded that we would be able to reach a total of 26 potential customers. This number seems fruitful, however, what we do not know yet is how the current budget compares to increases or decreases in budget.

For this, we have conducted what is known as a Sensitivity Analysis. This means we are comparing different budget levels to potential customers reached. We calculate this in "percentage-change" as it is a way to normalize our results in a way that are more easily interpreted.

For example, we have a graph below summarizing our findings from this analysis. We can see that our baseline budget is $10,000 and we show this as zero on the graph. Each step up or down in budget, displays the percentage of potential customers that will be reached (we show this percentage on the horizontal axis).



**Sensitivity Analysis of Advertising Budget**

Legend:
- $10,000 (baseline)
- $5,000
- $15,000
- $20,000
- $25,000
- $30,000
- $35,000

% Increase / Decrease in Customers Reached for a given Advertising Budget

The most striking findings are that decreasing the budget from $10,000 to $5,000 incurs a significant drop in customers reached by 50%. It is also clear that we are witnessing a pattern where the percentage increase is larger initially (from $10,000 to $15,000) and drops off more with each budget increase of $5,000. This could be due to several reasons. One reason that comes to mind is that not enough of potential customers are browsing the news sites included in the ad campaign. It's possible that more in-depth market research should be conducted to find additional websites in which to run ads.

Looking at our graph though, we can see that the ideal budget allocation is $15,000 per week. Any less, and SuperStar would not reach all of their potential customers, and any more, the company would be wasting money.

Overall, we would like to recommend to SuperStar to use the data included in this report to determine how to allocate their advertising funds. The models that we have built with linear programming and sensitivity analysis are powerful tools for businesses of any size but we are always grateful to work with such high profile clients. As always, if our results are unclear or limiting to management's ability to make decisions, we would love to open a dialog and talk about future studies that can be done. We do hope our report is insightful and look forward to a continued working relationship with SuperStar.

All the best,
Corey Daley with
MSBA204