Conjoint Analysis: Unlocking Consumer Preferences for Strategic Advantage

Definition of Conjoint Analysis

Conjoint analysis expects customers purchasing behaviors by assessing preferences for diverse combinations of different features involved in a specific product and diverse pricing strategies. The preferences for each combination indicate what features customers value most when purchasing products and how much they are willing to compromise among different features. This analysis allows companies to understand how much customers are willing to pay for diverse features and help them identify prices that maximize their revenue while tailoring products more effectively attracting customers by differentiating product from competitors in competitive markets.

Goals and Dataset Review

Utilizing 'Customer Preference' dataset, I created a function to identify optimal pricing of new products including WTP (Willingness to Pay), optimal share, optimal price, and optimal profit. The dataset includes diverse profile numbers defined by diverse profiled created by using product features, brands and prices. All product features, brands and prices are dummy variables. 'Screen 75 inch', 'Screen 85 inch' are dummy variables with the baseline variable of 'Screen 65 inch'. The 'Resolution 4K = 1' is a dummy variable with the baseline variable of 'Resolution 1K = 0'. Sony is encoded as 1 with the baseline variable of 'Sharp = 0' and 'Price (low = 0; high =1)' is a categorical variable with 2 values. I created a multiple linear regression with the dependent variable as preferences and diverse independent variables (product features, brands and prices) mentioned above and calculated beta coefficients, indicating the importance of each coefficient influenced on the dependent variable. These beta coefficients are used to calculate the importance of features. I created my own design to identify how market shares vary depending on price changes and profits to determine optimal pricing. I selected optimal pricing which maximized profit and plotted on how market shares and profits vary when prices are changed.

Mechanism of Conjoint Analysis and Outcomes

(1) Mechanism of Conjoin Analysis

Customers are presented with different product configurations and asked to rank their preferred options. This method mimics real-word purchasing decisions, providing robust data on consumer preferences. Statistical model, typically linear regression is used to estimate partworths which are numerical values representing the utility that consumers could obtain from each feature. Utilizing partworths for features, this conjoint analysis shows the importance of each feature, the willingness to pay for each attribute, optimal pricing strategies, and predicted market shares. Additionally, two plots describing the relationships between prices and predicted market shares as well as profits exhibit how market shares and profits vary depending on prices.

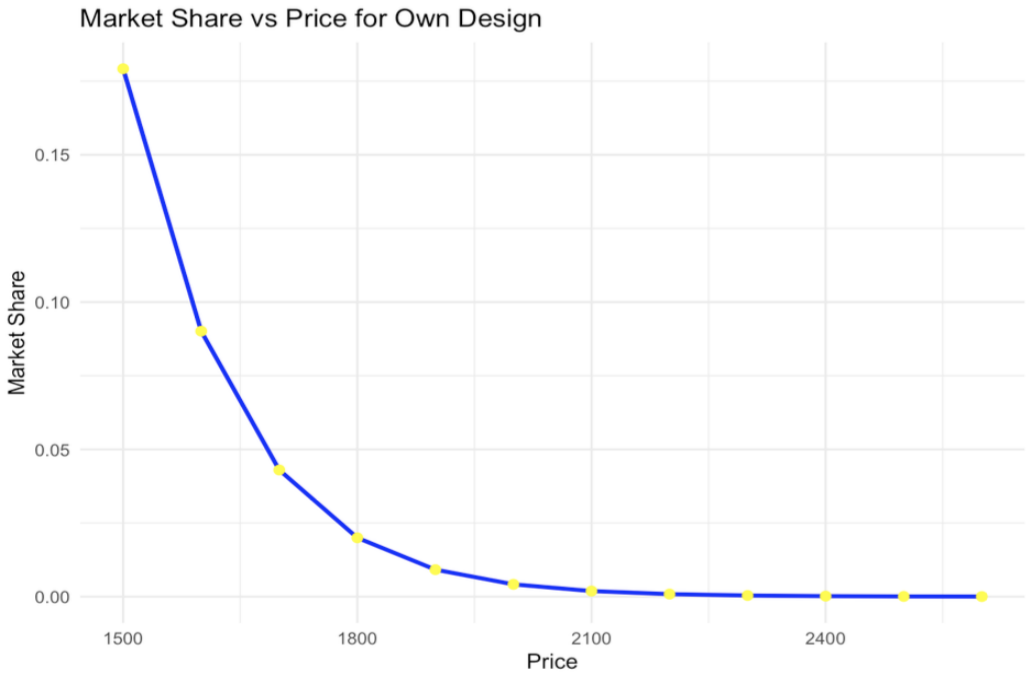
(2) Outcomes

Using multiple linear regression, the partworths of each product attribute, such as screen size, resolution, brand, and price were calculated. These beta coefficients of linear regression represent the impact of each feature on customer preferences. For example, the utility for a screen size of 85 inches is 4.33, while the utility for a 4K resolution is 5.45. On the other hand, the utility for a high price is -0.395, indicating a negative relationships as customers are typically sensitive to higher prices. Furthermore, t-values for coefficients indicate that all features significantly influence customer preferences.

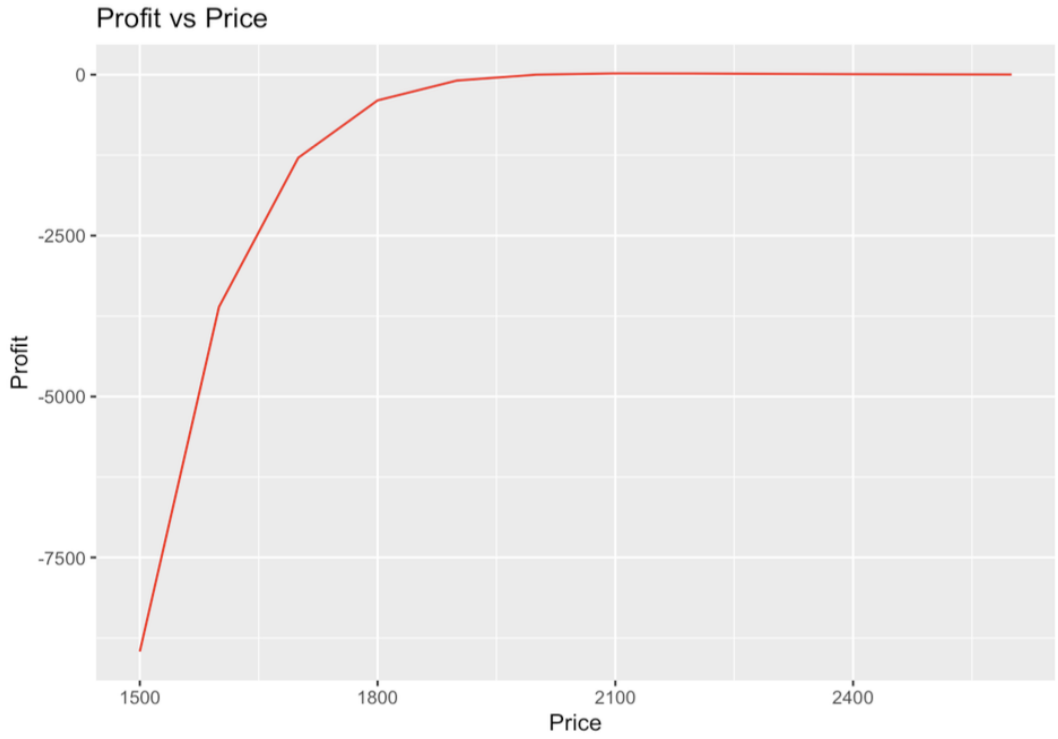
The importance of each attribute was calculated by dividing the utility range of each feature by the total utility range. Resolution (4K) accounted for the highest importance at 34.44%, followed by screen size (85 inches) at 27.38%. Price ranked third with an importance of 24.99%, while the brand (Sony) contributed 13.18%. These results show that customers prioritize resolution and screen size over price and brand.

The willingness to pay (WTP) for each feature was derived from the relationship between utilities and the price coefficient. Customers were willing to pay $547.88 for a screen size of 85 inches and $689.12 for a 4K resolution, compared to the baseline features such as 65 inches and 1K resolution respectively, which represents the highest value among all features. Meanwhile, they were willing to pay $263.65 for the Sony brand compared with the other Sharp brand. These finding indicate that higher resolution holds the most value for customers with screen size following closely behind.

A market share simulation was conducted by transforming prices from $1,500 to $2,600. This price changes show that the market shares decrease when the prices increase.



Profit optimization was performed by evaluating prices ranging from $1,500 to $2,600 to determine the price point that maximizes profit. The optimal price was identified as $2,100, yielding a maximum profit of $19.00 per unit. Setting a price above $2,100 reduces competitiveness due to higher costs, while a lower price sacrifices profitability. The profit increases when the prices transform as following the plot between two variable.



Insights and Conclusion

Conjoint analysis reveals that screen resolution and size are the most influential factors in purchasing decisions, with consumers willing to pay a premium for 4K resolution and larger screens. However, the analysis also highlights significant price sensitivity among consumers, emphasizing the importance of balancing premium features with competitive pricing. The optimal price point of $2,100 was identified as the price that maximizes profitability, but it does not necessarily align with maximizing market accessibility. To capitalize on these insights, the company should highlight premium features like 4K resolution and 85-inch screens in marketing campaigns to resonate with customers' needs while exploring pricing strategies that balance profitability and market share, ensuring broader consumer reach in price-sensitive markets.