Homework3 Everlane Marketing Strategy

Xuanhui Liao 44592188, Yunchan Sun 47737525, Becca Wernick 47818736, Taowan Yang 44510821, Xiaowen Zhang 47801472

Dec. 6th 2018

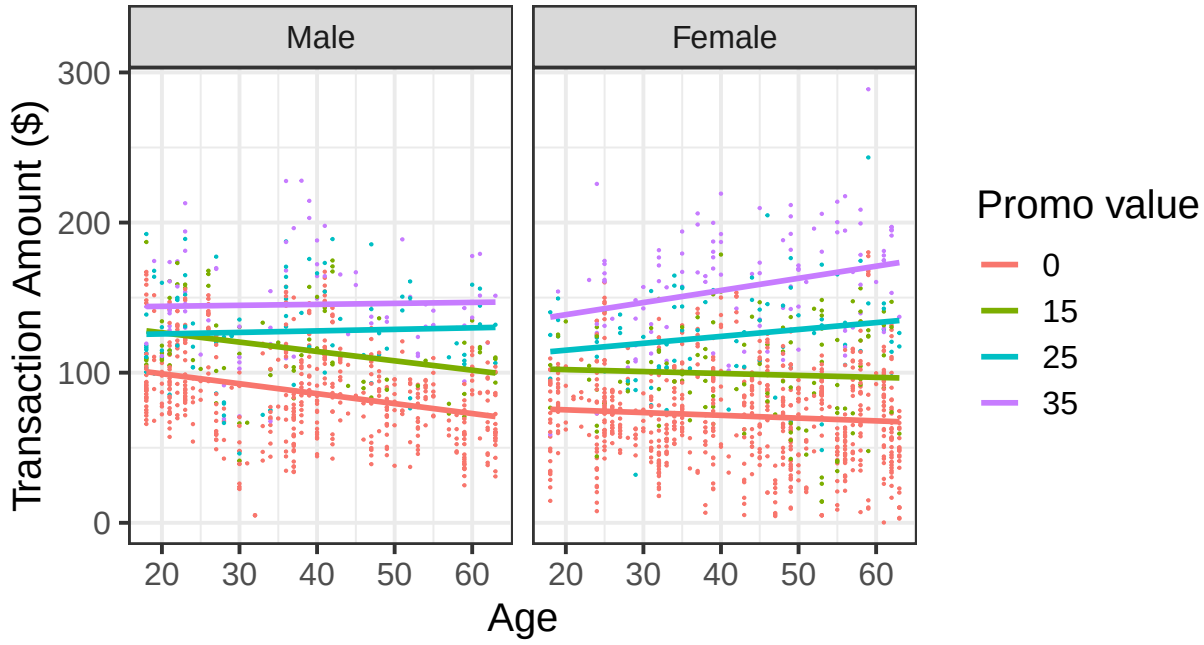
Project Overview

In this project, we aim to find a targeting strategy and provide business insights and suggestions for Everlane to maximize its profits, specifically through the use of promotions. We analyzed existing customer transactions and discounts data to build a model to predict customer spending behavior on an individual level by estimating the intercepts and promotion coefficients for each individual. We then targeted individuals with comparatively high sensitivity to promotions and calculated their expected revenue gains. Finally, we made recommendations for future promotional activity that will add value to Everlane's business.

Exploratory Data Analysis

In the EDA, we explored relationship between age and spending as well as gender and spending related to promotional value. A general pattern we discovered is that as promotion value increases, the promotion works more effectively in increasing the consumer spending. The dollar spend per transaction has an approximately normal distribution centered at around $100, with minimum of $0 and maximum of nearly $300.

For promo value 0, 15, and 25, average spending of males exceeds that of females, while for the highest promo value 35, average spending of females surpasses that of males. Therefore, larger promotional value encourages females to consume more.



As shown above, as they age, both male and female spend more at promotional value 25 and 35, while spending less at promotional value 0 and 15. There is one exception for men about 20 years of age, when promo 25 works better than promo 35. The steeper slope for promo 35 on the female graph indicates that older females have relatively higher sensitivity to larger discounts. Also, promo 0 generates the lowest average

transaction value, but there are a huge amount of transactions which could also bring a competitive amount of revenue.

Model Analysis

In our analysis, we utilized the generic model and individual model mentioned in class. We used Ranef() function to acquire the deviation of intercepts and promo coefficients for all customers. The deviation of promo coefficients indicate customers' sensitivity to promotion. For individuals with a positive deviation of promo coefficient, we suggest giving them promotions. For individuals with a negative value, we suggest not giving them any promotion.

We then did the analysis for the top 3 individuals that are the most sensitive to promotion. We should observe the pattern of these three individuals, and focus more on these types of customers in the future to generate more profits. The three individuals are ID 34 (female, age 40, promo coefficient 1.028), ID 343 (male, age 40, 1.147), and ID 148 (female, age 55, 1.415). Next, we used both models to evaluate their responsiveness to different promotional values. The result shows that the average spending is higher in individual model compared to generic model. Meanwhile, ID 34 has the highest amount spend (average $153.33) over four promo codes in individual model, ID 343 has the highest amount spend (average $119.95) over four promo codes in generic model.

The profit lift of the marketing campaign with individual level estimates is more significant in ID 34 with an increase of average $39 per transaction compared with an average of $23 per transaction in ID 343 and $19 in ID 148.

The expected revenues are shown below:

```
##      ID   Promo0  Promo15  Promo25  Promo35
## 1  ID34 91.20817 140.9082 174.0415 207.1749
## 2 ID343 85.44086 127.2446 155.1137 207.1749
## 3 ID148 59.98249 119.5566 159.2727 198.9887
```

We made several assumptions to calculate expected revenue gains:

- Average Cost of Goods Sold is 40% per transaction (based on Everlane website data)
- A $15 / $25 / $35 promotional discount costs Everlane $7.50 / $12.50 / $17.50

The actual profits are shown below:

```
##      ID   Promo0  Promo15  Promo25  Promo35
## 1  ID34 54.72490 77.04491 91.92492 106.8049
## 2 ID343 51.26452 68.84676 80.56825 106.8049
## 3 ID148 35.98949 64.23395 83.06359 101.8932
```

By comparing the expected revenue generated for the two models, marketing campaign based on individual level model is more profitable ($19-$39 more profit per transaction) versus mass-marketing strategies (base model). Having individual level estimates would give the company a chance to figure out the pattern of the customers who are more sensitive to promotions and tend to spend more. For instance, by applying promotion to the top three types of customers in our sample, the company could maximize their profits. Additionally, if the cost of promo 35 is not prohibitive, we would suggest making that promotion more widely available.

Furthermore, we suggest looking further into patterns in the dates, including holidays and seasonality, to seek new ways of improving profitability.