BUMK758: Advanced Marketing Analytics



**Promotional Effects**

**Group Number: #3**

**Chun-Ju Chang**

**Chieh Chen**

**Ho Yang Yin**

**Leor Newman**

**Po-Han Lai**

**Yuyang Liu**

**Date: Nov. 14th, 2016**

**Honor Pledge:**

We pledge on our honor that we have not given or received any unauthorized assistance on this assignment.

**Executive Summary**

Our memo will use the household scanner panel data to assess and evaluate the effectiveness of sales promotions throughout on various aspects of consumers’ purchasing behaviors. This will include their purchase incidence, brand choice, and purchase quantity decisions. Using three different types of models, we reached the determination that the three types of sales promotions (price discount, in-store display, and feature advertising) are significantly important in influencing consumers’ purchase incidence, brand choice, and purchase quantity decisions for the laundry detergent category

**Introduction and Background**

Sales promotions are tools frequently used by firms in order to boost sales and acquire customers by incentivizing the consumer. There are many different types of promotions from “buy one get one free” flash sales to the giant banners we see when we first walk in a store to promote the product. To run a successful sales promotion, a company must be able to decipher if their promotion is effective by using data to measure consumers’ purchase behaviors with and without the promotion.

In this memo, the goal is to determine the effectiveness of price discounts, in-store displays, and feature advertising on consumers’ purchase decisions for liquid laundry detergent. To do so, we will analyze four different products from two different brands, Wisk and All from Unilever and Cheer and Tide from Procter & Gamble. These were the top four selling liquid laundry detergent brands. The data used is from four stores all belonging to the same supermarket chain and located in close proximity. They also had the same pricing and promotion activities for the category under investigation.

**Data and Methodology**

Two sets of data were provided for this research. The first dataset contains 19,157 observations of household scanner panel during a 135-week period (since Jan. 6-12, ‘97). The second dataset contains 3,124 observations extracted from the first dataset for estimating brand choice models. Only data where a category purchase incident occurred were selected. Please see the abbreviations and explanations of variable in Table 1.1-1.3.

To assess the effectiveness of sales promotions, we built three models: A Binary Logit Model (Formula 1.1) for laundry detergent category purchase incidence, a Multinomial Logit Model (Formula 1.2) for brand choice, and a Purchase Quantity Models (Formula 1.3) to estimate the purchase quantity, conditional on a category purchase, and a chosen brand.

To study how each type of promotions affects sales quantity of Wisk, we calculated the expected sales quantities without promotion by summing up the results of multiplying possibilities of consumers buying the category, choosing Wisk, and the estimated purchase quantity of each household without promotions. Since we focus on promotion effects, we adjusted price cut (average price cut 0.7) for Wisk (*pcut1*), in-store display for Wisk (*disp1*) and feature advertisements for Wisk (*feat1*) separately to generate expected purchase quantities with each promotion. The adjustment led to change of purchase incidence of the category and brand choice odds. Eventually, we computed the percentage sales difference between using each promotion type to the baseline.

After testing the effect of each promotion, we wanted to examine the effects of multiple sales promotions. Here, Wisk is used as the reference to test the effects. If two promotions were considered simultaneously, there were three different combinations (price discount with display, feature with display and price discount with feature). We tested the effects of the three promotion combinations in order to provide the most effective one for the company. Then, we multiplied the three models above to acquire the expected sales quantity increase.

The issues discussed above were all based on the assumption that only one brand in the category was promoted. However, we would like to examine the effect of promoting two or more brands in the category at the same time. According to the findings mentioned above, we found that in-store display promotion was the most effective one. Therefore, we decided to use in-store display to observe the purchase incidence probability, brand choice probabilities, brand-specific sales quantities, and the total category sales quantities. We assumed that a company, such as Unilever and P&G, won’t promote their own brands at the same time. Therefore, we divided the situation into 2 kinds and used multiple model (*Expected Sales Quantity*) to test the different situation. The first situation was brand 1 Wisk and brand 3 Tide, the second situation was brand 1 Wisk and brand 4 Cheer. Lastly, we use brand 1 as a baseline to compare because Wisk was having the lowest sales quantities, hoping that we could improve the sales.

**Key Findings**

According to the SAS mean result (Table 2.1), regular price of brand Wisk, All, Tide and Cheer are 7.18 ,4.59 ,7.29 and 6.54 cents/ounce. In the following models, we put the mean regular price in the predictive model. Moreover, we use price cut (Wisk = 0.70; All = 0.82; Tide = 0.97; Cheer = 0.65) in each predictive model when we test the price cut promotion. The frequency of Wisk using display promotion and feature advertising is the highest (roughly 42% and 24%). Moreover, brand 3 Tide is the best seller in retail. 41% people who buy this category will buy the Tide products (Table 2.2).

*1. Purchase Incidence Model:* The SAS result of the Binary Logit model (Table 2.3) shows that the coefficients of the independent variables included in the model are statistically significant (p-value <.005). Based on the exponential of the coefficient, we could find that: (1) If average regular price increases 1 cent/oz., the odds of category purchase would decrease 53.3%. (2) If average price cut increases 1 cent/oz., the odds of category purchase increases by 190.3%. (3) In-store display increases the odds of category purchase by 63.2%. (4) Feature advertising increases the odds of category purchase by 74.5%. (5) In a household’s previous category purchase was made on promotion, the odd of category purchase would decrease 40.8%.

*2. Brand Choice Model:* Based on the exponential of the coefficient (Table 2.4), we could find that: (1) Household prefers Cheer to Wisk (*intcpt1*<0), All to Cheer (*intcpt*>0), and Tide to Cheer(*intcpt3*>0). However, the p-value of *intcpt2* is >0.05, suggesting that there might not be significant difference between the two brands. (2) If regular price increases 1 cent/oz, a brand’s odd of choice increases by 6.49%. Yet, the p-value of *regpr* is >0.05, suggesting that this result is not statistically significant. (3) If price cut increases 1 cent/oz, a brand’s odd of choice increases by 103.8%. (4) Conditional on a category purchase, in-store display increases a brand’s odds of choice by 269.6%. (5) Conditional on a category purchase, feature advertising increases a brand’s odds of choice by 47.8%.

*3. Purchase Quantity Models:* According to the SAS (Table 2.5), only *avol* is statistically significant in all models. The coefficient of *avol* suggests that 1 cent/oz increase in the household’s average purchase quantity in the previous period would increase the purchase quantity by 0.69% in the model of brand 1, 0.67% in brand 2, 0.67% in brand 3, and 0.29% in brand 4.

Comparing sales increase for each promotion type, we can tell that in-store display, which is the most effective one, can boost sales quantities by 420%. Surprisingly, providing average price cut had the least influence on sales quantities, which is 86% higher than sales without promotions. Feature advertising increases sales by 111% (Table 3.1).

After examining the effect of having multiple sales promotion, we can see that if the company want to do two promotions simultaneously, the best way is to use in-store display with feature advertising at the same time. The expected sales quantities increase by 875%. Moreover, we can find that the effect of having three promotions simultaneously is the greatest. The expected sales quantities increase by 1396% (Table 3.2).

To see the impact on promoting more than one brand in the category, we can see in the purchase incidence model that there is no difference in the probability of purchase incidence. Because both situations are in-store display promotion. The *cat\_disp* will always be 1.

In the brand choice model, when Wisk is the only brand having display promotion, the promotion effect on Wisk is from 16% to 41.3% (Table 3.3); however, when Tide is promoted with Wisk, the effect is dramatically decreased from 16% (correct: 41.3%) to 23.9%. When Wisk and Cheer are promoted at the same time, the effect varied from 16% to 28.6%. Furthermore, if retailer has in-store display on both of Unilever’s brands, the effect is from 16% to 29.5%. Therefore, we don’t consider it a good idea to promote brands of same company together because the efficiency would be low. This also confirmed our assumption that a company won’t promote their brands at the same time. Secondly, we compare the impact on when two or more promotions are applied but we find the outcome is the same as we consider one brand above.

Lastly, When Tide or Cheer is promoted with Wisk, the increase sales in percentage of Wisk dramatically decrease to 200% and 259%( which is 420% when Wisk is the only brand promoted). The possible reason is that customers have more choices with low prices, and some of them would buy the competitor's products. On the other hand, the total sales of the category when only Wisk was on promotion were 794.958 oz. After Tide or Cheer is promoted, the number goes to 787.510 and 818.647 oz. (Table 3.3). To dig in further, we compare all the possible combinations and the largest number appears when Wisk and Cheer are having in-store display.

**Conclusions and Recommendations**

From our studies we learned that all three types of promotions can improve sales quantities of laundry detergent products and purchase incidence of the category. Feature advertising is more effective than in-store display in terms of purchase incidence; nevertheless, taking a close look at brand Wisk, in-store display elevates more sales quantities than feature advertising. Since sales quantities with an average price cut underperformed those with in-store display or feature advertising, we recommend companies to have in-store display and feature advertising simultaneously to have higher sales quantities when they seek for a combination of two types of promotions.

Based on the findings in the Brand Choice Model, the probability of choosing Wisk will decrease when other brands are on promotion simultaneously, and the weakening effect is the biggest when Tide is promoted. Thus, we suggest retailers to beware of P&G’s promotion when promoting Wisk, especially when having in-store display for Tide.

In the expected purchase quantity model, we can find that total sales are the largest when Wisk and Cheer are promoted. Therefore, we will recommend that promoting Wisk and Cheer at the same time if a retailer want to have a highest total sale in a period.

Further study can be conducted on the promotion's effectiveness on profits instead of sales quantities. Since various types of promotions have different costs, merely revealing relationships between promotions and sales quantities cannot reflect how promotions can affect the bottom line of a company.

**Appendices**

**Table 1.1 Variables in “deterg.sas7bdat”**

|  |  |
| --- | --- |
| Variable | Definition |
| PANID | An 8-digit ID number for a household in the IRI panel. |
| WEEK | A numerical number representing the week according to IRI’s system.  (It ranges from 906 to 1040 in the data. week 906 refers to Jan. 6-12, 97) |
| INCID | = 1 if a household makes a category purchase in a given week; = 0 otherwise |
| CHOICE | = 0 if no category purchase incidence; = 1 if Wisk is chosen; = 2 if All is chosen; = 3 if Tide is chosen; = 4 if Cheer is chosen. |
| LCHOICE | Brand choice made on the previous category purchase occasion. Same coding as CHOICE. |
| VOLUME | Purchase quantity of the chosen brand, measured in ounces. |
| REGPR1 | Regular price for Wisk in a given week, measured in cents/ounce. |
| REGPR2 | Regular price for All in a given week, measured in cents/ounce. |
| REGPR3 | Regular price for Tide in a given week, measured in cents/ounce. |
| REGPR4 | Regular price for Cheer in a given week, measured in cents/ounce. |
| PCUT1 | Amount of price cut for Wisk in a given week, measured in cents/ounce. |
| PCUT2 | Amount of price cut for All in a given week, measured in cents/ounce. |
| PCUT3 | Amount of price cut for Tide in a given week, measured in cents/ounce. |
| PCUT4 | Amount of price cut for Cheer in a given week, measured in cents/ounce. |
| DISP1 | = 1 if Wisk has an in-store display promotion in a given week; = 0 otherwise |
| DISP2 | = 1 if All has an in-store display promotion in a given week; = 0 otherwise |
| DISP3 | = 1 if Tide has an in-store display promotion in a given week; = 0 otherwise |
| DISP4 | = 1 if Cheer has an in-store display promotion in a given week; = 0 otherwise |
| FEAT1 | = 1 if Wisk has a feature ad promotion in a given week; = 0 otherwise |
| FEAT2 | = 1 if All has a feature ad promotion in a given week; = 0 otherwise |
| FEAT3 | = 1 if Tide has a feature ad promotion in a given week; = 0 otherwise |
| FEAT4 | = 1 if Cheer has a feature ad promotion in a given week; = 0 otherwise |
| LBPROMOT | = 1 if the previous category purchase was made on promotion; = 0 otherwise |
| AVOL | A household’s average purchase quantity in a previous period, in ounces. |

**Table 1.2 Variables in “choice\_det.sas7bdat”**

|  |  |
| --- | --- |
| *Variable* | *Definition* |
| CASEID | An ID number for each choice occasion. |
| PANID | An 8-digit ID number for a household in the IRI panel. |
| WEEK | A numerical number representing the week according to IRI’s system.  (It ranges from 906 to 1040 in the data.) |
| BRAND | 1 = Wisk; 2 = All; 3 = Tide; 4  = Cheer |
| DECISION | 1 = the brand (as indicated by BRAND) is chosen; 0 = otherwise |
| REGPR | Regular price for the brand (as indicated by BRAND), in cents/ounce. |
| PCUT | Amount of price cut for the brand (as indicated by BRAND), in cents/ounce. |
| DISP | 1 = there was an in-store display promotion for the brand (as indicated by BRAND); 0 = otherwise |
| FEAT | 1 = there as a feature advertising promotion (i.e., Free Standing Insert) for the brand (as indicated by BRAND); 0 = otherwise |

**Table 1.3 Additional Variables in Models**

|  |  |
| --- | --- |
| Variable | Definition |
| Purchase Incidence Model | |
| AVG\_RP | average regular price of the category |
| AVG\_PC | average price cut of the category |
| CAT\_DISP | =1 if any brand in the category is on in-store display; 0 otherwise. |
| CAT\_FEAT | =1 if any brand in the category is on feature advertising; 0 otherwise. |
| Brand Choice Model | |
| INTCPT1 | dummy variables for estimating the intercepts; brand=1 then intcpt1=1; |
| INTCPT2 | brand=2 then intcpt1=1; |
| INTCPT3 | brand=3 then intcpt1=1; |

**Formula 1.1 Purchase Incidence Model**

\*A Binary Logit model is used here because incid, either 1 or 0, has a binomial distribution. The independent variables are factors that we believe would influence the purchase incidence. Besides the three promotions, regular price and whether a household purchased a category previously was under a sales promotion are also taken into consideration.

**Formula 1.2 Brand Choice Model**

\*A Multinomial Model is used here because , a variable showing whether a given brand k is purchased, has a multinomial distribution. In this model, brand 4 (Cheer) is chosen as the baseline. The independent variables in the brand utility function are factors that could influence the attractiveness of a brand. They are the three promotions which we would like to assess and the regular price of the given brand. Intercepts of the comparing brands are added into the model to examine households’ preferences of a brand comparing to the baseline, brand 4.

**Formula 1.3 Purchase Quantity Models**

\* A semi-log model is used to estimate the purchase quantity. The independent variables are factors that we believed would influence the purchase quantity. Besides the three promotions we would like to assess, the volume a household bought in their previous visit and whether the previous purchased occurred under a sales promotion are also factors that wtaken into consideration.

**Table 2.1The MEANS Procedure**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | |
| Variable | N | Mean | | Std Dev | | Minimum | | Maximum |
| regpr1 | 19157 | 7.182 | | 0.309 | | 6.747 | | 7.769 |
| regpr2 | 19157 | 4.592 | | 0.332 | | 4.120 | | 5.028 |
| regpr3 | 19157 | 7.285 | | 0.352 | | 6.852 | | 7.803 |
| regpr4 | 19157 | 6.538 | | 0.291 | | 5.710 | | 6.790 |
| disp1 | 19157 | 0.417 | | 0.493 | | 0.000 | | 1.000 |
| disp2 | 19157 | 0.340 | | 0.474 | | 0.000 | | 1.000 |
| disp3 | 19157 | 0.293 | | 0.455 | | 0.000 | | 1.000 |
| disp4 | 19157 | 0.089 | | 0.284 | | 0.000 | | 1.000 |
| feat1 | 19157 | 0.239 | | 0.427 | | 0.000 | | 1.000 |
| feat2 | 19157 | 0.222 | | 0.416 | | 0.000 | | 1.000 |
| feat3 | 19157 | 0.232 | | 0.422 | | 0.000 | | 1.000 |
| feat4 | 19157 | 0.059 | | 0.235 | | 0.000 | | 1.000 |
| avg\_rp | 19157 | 6.399 | | 0.277 | | 5.978 | | 6.848 |
| avg\_pc | 19157 | 0.068 | | 0.089 | | 0.000 | | 0.450 |
| cat\_disp | 19157 | 0.816 | | 0.388 | | 0.000 | | 1.000 |
| cat\_feat | 19157 | 0.672 | | 0.470 | | 0.000 | | 1.000 |
| **Table 2.2 Table of choice by incid** | | | | | | | |
| choice | | | incid | | | |  |
| Frequency Percent Col Pct | | | 0 | | 1 | | Total |
| 0 | | | 18376 | | 0 | | 18376 |
| 95.92 | | 0 | | 95.92 |
| 100 | | 0 | |  |
| 1 | | | 0 | | 164 | | 164 |
| 0 | | 0.86 | | 0.86 |
| 0 | | 21 | |  |
| 2 | | | 0 | | 172 | | 172 |
| 0 | | 0.9 | | 0.9 |
| 0 | | 22.02 | |  |
| 3 | | | 0 | | 324 | | 324 |
| 0 | | 1.69 | | 1.69 |
| 0 | | 41.49 | |  |
| 4 | | | 0 | | 121 | | 121 |
| 0 | | 0.63 | | 0.63 |
| 0 | | 15.49 | |  |
| Total | | | 18376 | | 781 | | 19157 |
| 95.92 | | 4.08 | | 100 |

**Table 2.3 Coefficient of Variables in Model 1**

|  |  |  |  |
| --- | --- | --- | --- |
| Variable(X) | Estimate  (b) | Expo(b) | P  value |
| Intercept | 1.201 | 3.322 | 0.194 |
| avg\_rp | -0.763 | 0.466 | <.0001 |
| avg\_pc | 1.066 | 2.903 | 0.004 |
| cat\_disp | 0.490 | 1.632 | 0.001 |
| cat\_feat | 0.557 | 1.745 | <.0001 |
| lbpromot | -0.524 | 0.592 | <.0001 |

**Table 2.4   Coefficient of Variables in Model 2**

|  |  |  |  |
| --- | --- | --- | --- |
| Variable(X) | Estimate  (b) | Expo(b) | P  value |
| intcpt1 | -0.435 | 0.647 | 0.049 |
| intcpt2 | 0.016 | 1.016 | 0.975 |
| intcpt3 | 0.445 | 1.560 | 0.041 |
| regpr | 0.063 | 1.065 | 0.804 |
| pcut | 0.712 | 2.038 | 0.003 |
| disp | 1.307 | 3.696 | <.0001 |
| feat | 0.391 | 1.478 | 0.001 |

|  |  |  |  |
| --- | --- | --- | --- |
| **Table 2.5   Coefficient of Variables in Model 3** | | | |
| Brand 1 |  |  |  |
| Variable(X) | Estimate (b) | Expo(b) | P value |
| Intercept | 3.546 | 34.667 | <.0001 |
| avol | 0.007 | 1.007 | <.0001 |
| regpr1 | 0.036 | 1.037 | 0.582 |
| pcut1 | 0.009 | 1.009 | 0.916 |
| lbpromot | 0.072 | 1.075 | 0.199 |
| Brand 2 |  |  |  |
| Variable(X) | Estimate (b) | Expo(b) | P value |
| Intercept | 4.297 | 73.444 | <.0001 |
| avol | 0.007 | 1.007 | <.0001 |
| regpr2 | -0.102 | 0.903 | 0.177 |
| pcut2 | 0.257 | 1.292 | 0.094 |
| lbpromot | 0.090 | 1.094 | 0.107 |
| Brand 3 |  |  |  |
| Variable(X) | Estimate (b) | Expo(b) | P value |
| Intercept | 3.698 | 40.359 | <.0001 |
| avol | 0.007 | 1.007 | <.0001 |
| regpr3 | 0.029 | 1.029 | 0.514 |
| pcut3 | 0.017 | 1.017 | 0.779 |
| lbpromot | 0.019 | 1.019 | 0.608 |
| Brand 4 |  |  |  |
| Variable(X) | Estimate (b) | Expo(b) | P value |
| Intercept | 3.873 | 48.070 | <.0001 |
| avol | 0.003 | 1.003 | <.0001 |
| regpr4 | 0.067 | 1.070 | 0.159 |
| pcut4 | 0.055 | 1.056 | 0.229 |
| lbpromot | 0.002 | 1.002 | 0.940 |

**Table 3.1 The Effect of Each Promotion Type for Wisk**

|  |  |  |  |
| --- | --- | --- | --- |
| Brand 1 | Each Sales Promotion | | |
|  | Total sales (no prom): |  |  |
| Brand 1 | 65.471 |  |  |
|  | Price Discount | | |
|  | Total sales (with prom): | Sales increase | increase |
| Brand 1 | 122.013 | 56.542 | **86%** |
|  | In-Store Display | | |
|  | Total sales (with prom): | Sales increase | % increase |
| Brand 1 | 340.354 | 274.884 | **420%** |
|  | Feature Advertising | | |
|  | Total sales (with prom): | Sales increase | % increase |
| Brand 1 | 138.153 | 72.682 | **111%** |

**Table 3.2 The Effects of Promotion Combination**

|  |  |  |  |
| --- | --- | --- | --- |
| Brand 1 | Multiple Sales Promotion | | |
|  | Total sales (no prom): | | |
| Brand 1 | 65.471 | | |
| Brand 2 | 97.756 | | |
| Brand 3 | 196.432 | | |
| Brand 4 | 110.913 | | |
|  | Price Discount with In-Store Display | | |
|  | Total sales (with prom): | Sales increase | % increase |
| Brand 1 | 550.723 | 485.252 | 741% |
| Brand 2 | 103.502 | 5.746 | 6% |
| Brand 3 | 207.978 | 11.546 | 6% |
| Brand 4 | 117.432 | 6.519 | 6% |
|  | In-Store Display with Feature Advertising | | |
|  | Total sales (with prom): | Sales increase | % increase |
| Brand 1 | 638.648 | 573.177 | **875%** |
| Brand 2 | 155.278 | 57.523 | 59% |
| Brand 3 | 312.018 | 115.587 | 59% |
| Brand 4 | 176.177 | 65.265 | 59% |
|  | Price Discount with Feature Advertising | | |
|  | Total sales (with prom): | Sales increase | % increase |
| Brand 1 | 247.885 | 182.414 | 279% |
| Brand 2 | 162.796 | 65.041 | 67% |
| Brand 3 | 327.125 | 130.693 | 67% |
| Brand 4 | 184.707 | 73.794 | 67% |
|  | Three Promotions | | |
|  | Total sales (with prom): | Sales increase | % increase |
| Brand 1 | 979.346 | 913.875 | **1396%** |
| Brand 2 | 138.841 | 41.086 | 42% |
| Brand 3 | 278.989 | 82.558 | 42% |
| Brand 4 | 157.528 | 46.615 | 42% |

**Table 3.3 The Effects of In-store Display Promotion with Different Brands**

|  |  |  |  |
| --- | --- | --- | --- |
|  | disp1 (Wisk) | | |
|  | Total sales (with prom): | Sales increase | % increase |
| Brand 1 | 340.354 | 274.884 | **420%** |
| Brand 2 | 109.702 | 11.946 | 12% |
| Brand 3 | 220.436 | 24.004 | 12% |
| Brand 4 | 124.466 | 13.554 | 12% |
| Total sales | **794.958** | 324.387 |  |
|  | Without promotion | With promotions |  |
| Pr(I=1) | 2.46% | 3.95% |  |
| Pr(B1=1) | 16.01% | 41.34% |  |
| Pr(B2=1) | 21.37% | 14.92% |  |
| Pr(B3=1) | 38.86% | 27.14% |  |
| Pr(B4=1) | 23.77% | 16.60% |  |
|  | disp1+3(Wisk+Tide) | | |
|  | Total sales (with prom): | Sales increase | % increase |
| Brand 1 | **196.533** | 131.062 | **200%** |
| Brand 2 | 63.346 | -34.410 | -35% |
| Brand 3 | 455.761 | 259.329 | 132% |
| Brand 4 | 71.871 | -39.041 | -35% |
| Total sales | **787.51** | 316.939 |  |
|  | Without promotion | With promotions |  |
| Pr(I=1) | 2.46% | 3.95% |  |
| Pr(B1=1) | **16.01%** | **23.87%** |  |
| Pr(B2=1) | 21.37% | 8.62% |  |
| Pr(B3=1) | 38.86% | 57.93% |  |
| Pr(B4=1) | 23.77% | 9.58% |  |
|  | disp1+4(Wisk+Cheer) | | |
|  | Sales (with prom): | Sales increase | % increase |
| Brand 1 | **235.116** | 169.645 | 259% |
| Brand 2 | 75.782 | -21.974 | -22% |
| Brand 3 | 152.277 | -44.155 | -22% |
| Brand 4 | 355.473 | 244.560 | 220% |
| Total sales | **818.647** | 348.076 |  |
|  | Without promotion | With promotions |  |
| Pr(I=1) | 2.46% | 3.95% |  |
| Pr(B1=1) | 16.01% | **28.56%** |  |
| Pr(B2=1) | 21.37% | 10.31% |  |
| Pr(B3=1) | 38.86% | 18.75% |  |
| Pr(B4=1) | 23.77% | 42.39% |  |