**Quantifying and Improving Promotion Effectiveness**

Cannibalisation: Loss in sales of competing/substitute items due to anchor item’s promotion. Halo: Lift in sales of items that go well with the anchor item (complementary items).

**Adjusted Baseline=**baseline\_sse +

Where:

m: number of items in promotion to those base item is complementary item

r: number of substitute items of the base item those are into promotion  
q: quantity sold during promo-week  
b: predicted baseline sale of the product during promo-week  
p: normalized price ratio of complementary/substitute item to the base item

(q − b) = uplift in sale

Consider a product **A** as base product and **B** as its substitute (where **B** is also in promotion at the same time).Here we are calculating “**adjusted baseline**” of promoted product **A** by considering how much product **B** cannibalizes product **A** if **B** is on promotion for the given week and **A** is a substitute/complementary of product **B**.

**Analysis of Halo/Cannibalisation of a given promotion:**

**Net Unit Impact** =

**Net Profit Impact** =((

– (% Cannibalisation × Lift \*(regular\_price – cost\_price))

− (% Pull\_forward × Lift \*(regular\_price – cost\_price))

+ (% Halo × Lift \*(regular\_price – cost\_price)))

− ( \*(regular\_price – cost\_price)) - Promo Expense))

Where:

n: number of items in promotion

m: number of units of an item sold during promotion

Promo Expense: marketing expenditure

Lift: uplift of promoted product (quantity-baseline)

% Cannibalisation =

p: number of substitute items not in promotion

uplift=(quantity – baseline) of substitute item

**Purpose** : purpose of this project is to quantify and improve the net impact of Lowe’s promotions by

-identifying a suitable methodology that (a) provides robust estimates of the gross lift and net impact; (b) is practical to implement on an ongoing basis for the evaluation of millions of promotions offered in stores each year.

We want to ensure that promotional pricing decisions are effective in competing with other retailers and in their net sales and profit impact for the company. To do so, it needs to (1) determine which promotions are effective, which ones are not, and why; (2) eliminate or modify ineffective promotions; and (3) reinvest the savings in more competitive prices and better merchandising.

This analysis will not only help the company to determine which promotions were particularly ineffective and which ones were more effective but also provide a deeper understanding of why such variation exists, and how to implement more effective promotions, as we can quantify the net unit and profit impact of each promotion offered with this approach.

We will be able to answer questions like:

-Are promotions on some products particularly effective in increasing sales elsewhere in the store?

-Does a net increase in units after accounting for these components imply a net increase in profit?

-In which categories are promotions most and least effective and why?

-Later we can experiment and test the impact of the recommended changes on stores. So that decision on promotion must happen on scientific measurement and tests.

**Validation:**

* Validate the baseline calculation of complementary/substitute items same as we are validating baseline of promoted items (using MAPE).
* Experiment some of the promotional insights from this approach on few test stores (cluster the stores based on their sales pattern, then remove/modify promotion based on output of above approach on few stores of a cluster and do not change promotion on other stores to analyse and verify the output)

**Suggestion:**

* We can incorporate “adjusted baseline” into the production pipeline to showcase it at item level.
* We can do promotion wise analysis separately after few weeks/months promotion has happened.