

## Machine Learning Based Approach for Measuring Promotion Effectiveness in Multiple Parallel Promotions' Scenarios

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**Abstract :** Promotion is a key element in the retail business. Thus, analysis of promotions to quantify their effectiveness in terms of Revenue and/or Margin is an essential activity in the retail industry. However, measuring the sales/revenue uplift is based on estimations, as the actual sales/revenue without the promotion is not present. Further, the presence of Halo and Cannibalization in a multiple parallel promotions' scenario complicates the problem. Calculating Baseline by considering inter-brand/competitor items or using Halo and Cannibalization's impact on Revenue calculations by considering Baseline as an interpretation of items' unit sales in neighboring nonpromotional weeks individually may not capture the overall Revenue uplift in the case of multiple parallel promotions. Hence, this paper proposes a Machine Learning based method for calculating the Revenue uplift by considering the Halo and Cannibalization impact on the Baseline and the Revenue. In the first section of the proposed methodology, Baseline of an item is calculated by incorporating the impact of the promotions on its related items. In the later section, the Revenue of an item is calculated by considering both Halo and Cannibalization impacts. Hence, this methodology enables correct calculation of the overall Revenue uplift due a given promotion.

**Keywords :** Halo, Cannibalization, promotion, Baseline, temporary price reduction, retail, elasticity, cross price elasticity, machine learning, random forest, linear regression

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