Wine Retailer Case Assignment

MSMA Group 7
Yanzi Cai, Dong Li, Keyan Wang, Sizhu Wu, Ao Zhang

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Key Findings

- Before targeting, on average, control group purchases $12.77 and treatment group (receive email) purchases $14.12.

- According to slice and dice analysis, recent buyers (days since last purchase < 35 days) can increase the overall purchase power by 58%, email effect by 2% and email effect size by 90%.

- Further study running causal forest model picks out 55% of buyers from which sending email can generate positive profit.

- The company is suggested to target customers who are recent and frequent buyers. They prefer Chard and Cab and may not be big fans of Syrah.

Methodology

01

Average Causal Effect

1. **Check randomization** to make sure the baseline variables are not different between email group and control group.

2. Run **regression between purchase and group**. Since two groups are randomized generated, do not need to add control variables into the regression.

02

Slice and Dice

1. **Test different cutoffs** for each baseline variable to segment customers . The suitable cutoff can help us target a group of people for which email is more effective.

2. Segment **Criteria**: a. Size for each segment should be no less than 40% of the total training sample.
b. The target segment should be more sensitive to email than the contra group.

03

Conditional Causal Effect

1. **Tune causal forest model** using training dataset.

2. **Predict the purchase** of training sample by applying tuned causal forest model.

3. **Calculate profits** by comparing lift value (how much email can increase purchase) with cost to determine target group.

4. **Summarize baseline variables** of both target group and non-target groups

Target recent buyers can increase email effect size by 90%.
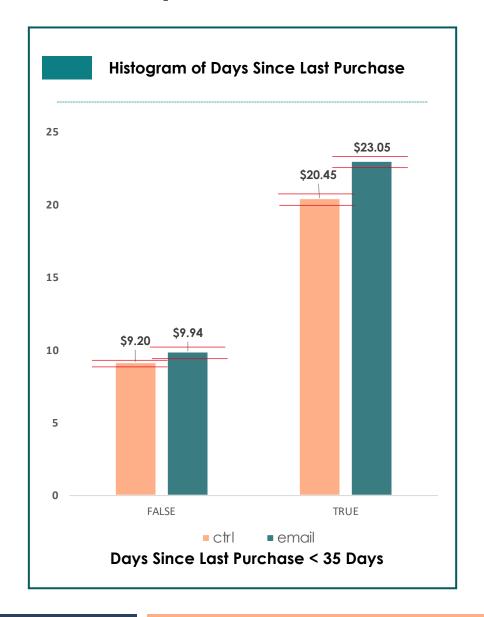
Average Causal Effect

Control Group
$12.77

Treatment Group
$14.12

Email increases purchase by $1.35.

Email Effect after Slice and Dice

Email Target: Days Since Last Purchase < 35 Days

- Recent buyers tend to have **$11.25 higher** average purchases in the future.
- Recent buyers are more affected by the email, leading to **addition $1.88** in spending.
- Target this group of buyers can **increase** the overall purchase power by **58%**, email effect by **2%** (10.6% ~ 12.7%) and email effect size by **90%** ($1.35 ~ $2.6).

Histogram of Days Since Last Purchase

$23.05
$20.45
$9.20 $9.94

25
20
15
10
5
0

FALSE   TRUE

ctrl   email

Days Since Last Purchase < 35 Days

* Email effect: increased % of revenue. $1.35/$12.77=10.6% => $2.6/$20.45=12.7%.

Recent and frequent wine buyers are target email receiver.

Predicted Target Group Size	Baseline Variables	Target	Non-Target
	Past Purchase	$154.71	$100.65
	Last Purchase	**73 Days**	112 Days
55.2%	Visits	6 Times	6 Times
of the training sample	Chard	$93.97	$49.23
	Sav-blanc	$27.93	$25.21
	Syrah	**$2.27**	$3.55
	Cab	$30.55	$22.65

* Mean of each baseline variable

Description of Target Group

Target email receiver is a group of customers who are recent buyers with relatively higher purchase value. They prefer Chard and Cab. But they may not be big fans of Syrah.