Impact of Fast Shipping on Sales

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Overview and Objectives

1) Estimate the average boost in sales on different scopes
2) Measure the marginal effect of sales boost: how the sales boost changes as the portion of products offered with fast shipping increases.
3) Identify key product characteristics that will make the product sales more sensitive to fast shipping.

Experimental Design

Treatment Effect Definition

Aggregation: total number of orders
25% more sales
Convension rate: nb. of orders / nb. of impressions
46% more sales

Issues:
- Not factoring in the increase product exposure due to the sort-boost effect of fast-shipping.
- Only 30% products receive sales boost under this framework. Estimate only applies to these products.

Task 1: average boost in sales

Task 2: impact of S-value

Task 3: important product features

Aggregation-based approach:
1. 25% increase in sales.
2. We can expect that order number and quantities sold scale linearly as s-value increases.

Conversion rate-based approach:
1. 46% more sales for products whose conversion rates does not degrade with fast-shipping.
2. The effect of fast-shipping has a much larger impact on the conversion rate from product display page clicks to quantities ordered, than the conversion rate from the impression to product display page clicks. The conversion rate from impression to quantities ordered with fast-shipping increases as s-value increases.
3. For popular products, adding fast shipping label won't have a significant contribution in boosting conversion rate.

Conclusion

Aggregation-based approach:

Conversion rate-based approach:

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Reference

3. EconML: Python SDK, developed by the ALICE team at MSR New England
4. GRET: Generalized Random Forest, a pluggable package for forest-based statistical estimation and inference.