

Marketing Campaign Effectiveness Analysis



An Evaluation of Catalog Distribution Impact
on Profits

Problem Statement

- **Objective:** Evaluate whether sending catalogs leads to increased customer profits.
- **Key Questions:**
 1. Does the campaign generate sufficient returns to justify its cost?
 2. How do results vary across regions?



Methodology

- **Statistical Techniques:**
 - Pre-treatment vs. post-treatment profit comparisons.
 - Average Treatment Effect (ATE) estimation.
 - Difference-in-Differences (Diff-in-Diff) analysis.
 - Hypothesis testing (T-tests, Chi-square tests).
- **Data Validation:** Randomization checks.



Key Findings

- **Treatment Effects:**
 - ATE: \$17.74 (p-value = 0.0039).
 - Diff-in-Diff: \$22.31 (statistically significant).
- **State-Level ATEs:**
 - Virginia: \$0.96.
 - Ohio: \$18.17.
 - Georgia: \$31.16.



Statistical Validation

- **Randomization Results:**
 - T-test for pre-treatment profits ($p = 0.27$).
 - Chi-square test for state distribution ($p = 0.83$).
- **Significance:**
 - Both ATE and Diff-in-Diff results are statistically significant.



Recommendations

- **Target Georgia:** High ATE justifies campaign expansion.
- **Cautious Approach in Ohio:** Analyze additional strategic factors.
- **Exclude Virginia:** Minimal profitability impact.



Expected Gains

- Georgia Campaign: \$1,206,790.78.
- Overall Campaign: \$995,187.35 (preliminary estimate).



Conclusion

- **Summary:**
 - The campaign shows potential profitability with targeted execution.
 - Focus on regions with high returns (e.g., Georgia).
- **Next Steps:**
 - Optimize resources for targeted campaigns.
 - Conduct further analysis to refine strategies.