Assignment 1: The Strange Case of Isabelle's Personalized Product Campaign

ECON 140: Econometrics

Due: Tuesday September 16 at Midnight, via Gradescope (PDF)

Background

One of the "big banks" in the United States designed a new package of products and services to offer its clients. The package was introduced through a short 5-minute presentation delivered by client managers (CMs). To test whether this presentation increased profitability, the bank conducted a pilot program:

- CMs randomly selected walk-in clients and offered them the presentation.
- Some clients agreed to receive the presentation, others did not.

The VP of Customer Loyalty and Insight, Isabelle, and her team strongly believed that the presentation would boost client profitability.

Pilot Results

- Average profit without presentation: 921.82 USD
- Average profit with presentation: 883.56 USD

At first glance, these results seem disappointing. Isabelle and her team are unsure what went wrong.

Your Task

You are part of Isabelle's group. Using the pilot data, you must prepare a short analysis and present your findings to the bank's executives.

The dataset (Isabelle.xlsx) includes:

- Client ID
- Gender
- Age
- Monthly Income (5 bins)
- Profits
- Indicator for whether the client received the presentation (Yes/No)

Questions

1. **Overall Effect** Did the presentation increase or decrease client profitability on average? Support your answer with descriptive statistics and graphs.

2. **Heterogeneity** Was the effect the same across different income levels and demographic groups (e.g., gender, age)? Show plots or summary tables to support your claims.

3. **Interpretation** Why might the raw averages suggest that the presentation reduced profitability? What potential issues with the sample or data collection could explain this result?

4. **Recommendations** Based on your analysis, what would you recommend to Isabelle and the executives? Should they scale up the program, abandon it, or collect more evidence first?

Output

- A short (2–3 page) report or slide deck.
- Include:
    - Summary statistics and visualizations (tables, graphs) and the respective code.
    - Clear answers to the four questions above.
    - A concluding recommendation.