

# Direct Marketing Optimisation

**Rebel Foods**

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# Problem Statement

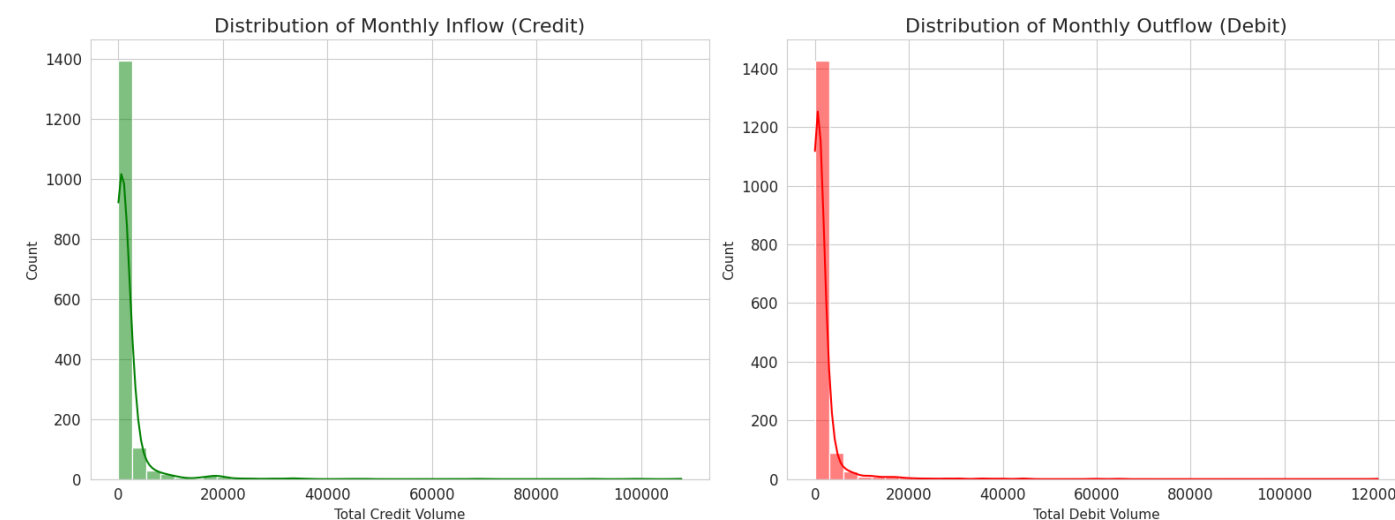
- Which clients have higher propensity to buy consumer loan?
- Which clients have higher propensity to buy credit card?
- Which clients have higher propensity to buy mutual fund?
- Which clients are to be targeted with which offer?

# Data Exploration

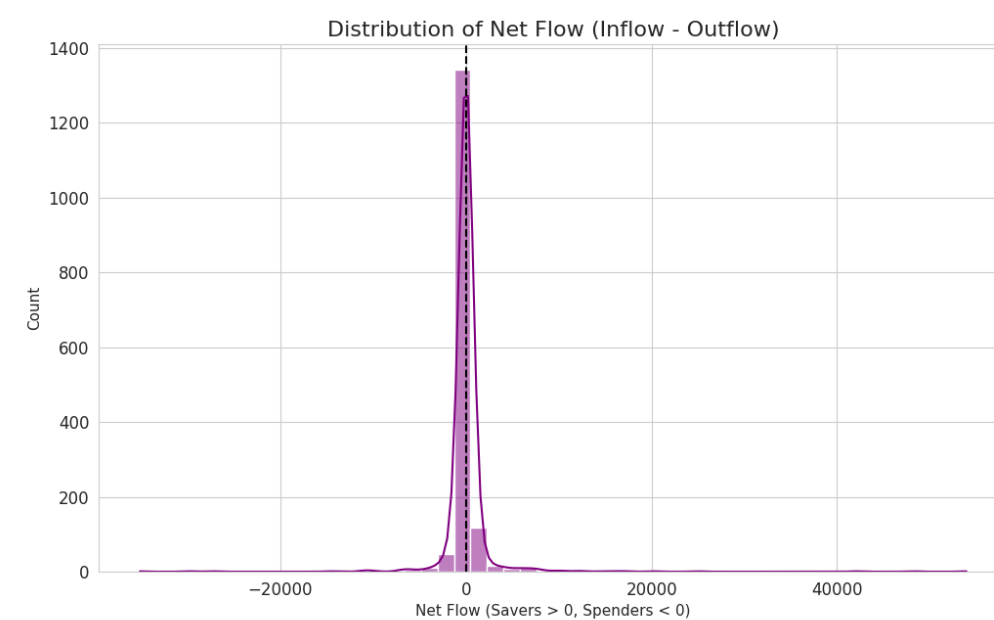
# Key Findings

## Distribution of Inflow and Outflow

- Both the total monthly inflow (credit) and outflow (debit) are heavily skewed to the right. This indicates that most clients have relatively modest monthly transaction volumes, while a smaller group of clients transact with significantly larger sums of money.

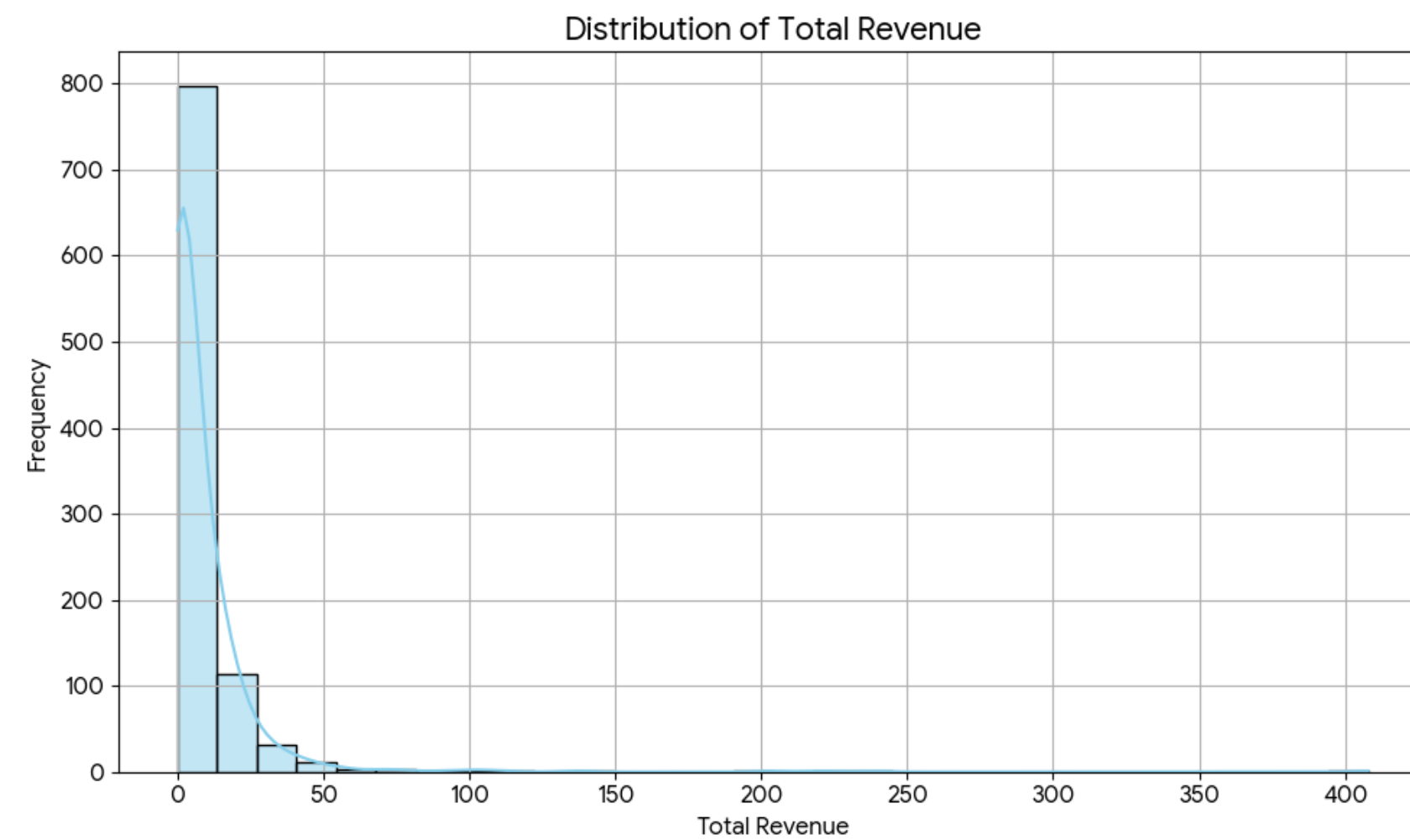


- There are almost equal amount of spenders (negative net outflow) and savers (positive net inflow). Savers can be targeted with Mutual Funds & spender can be targeted with Credit Cards & Consumer Loans.



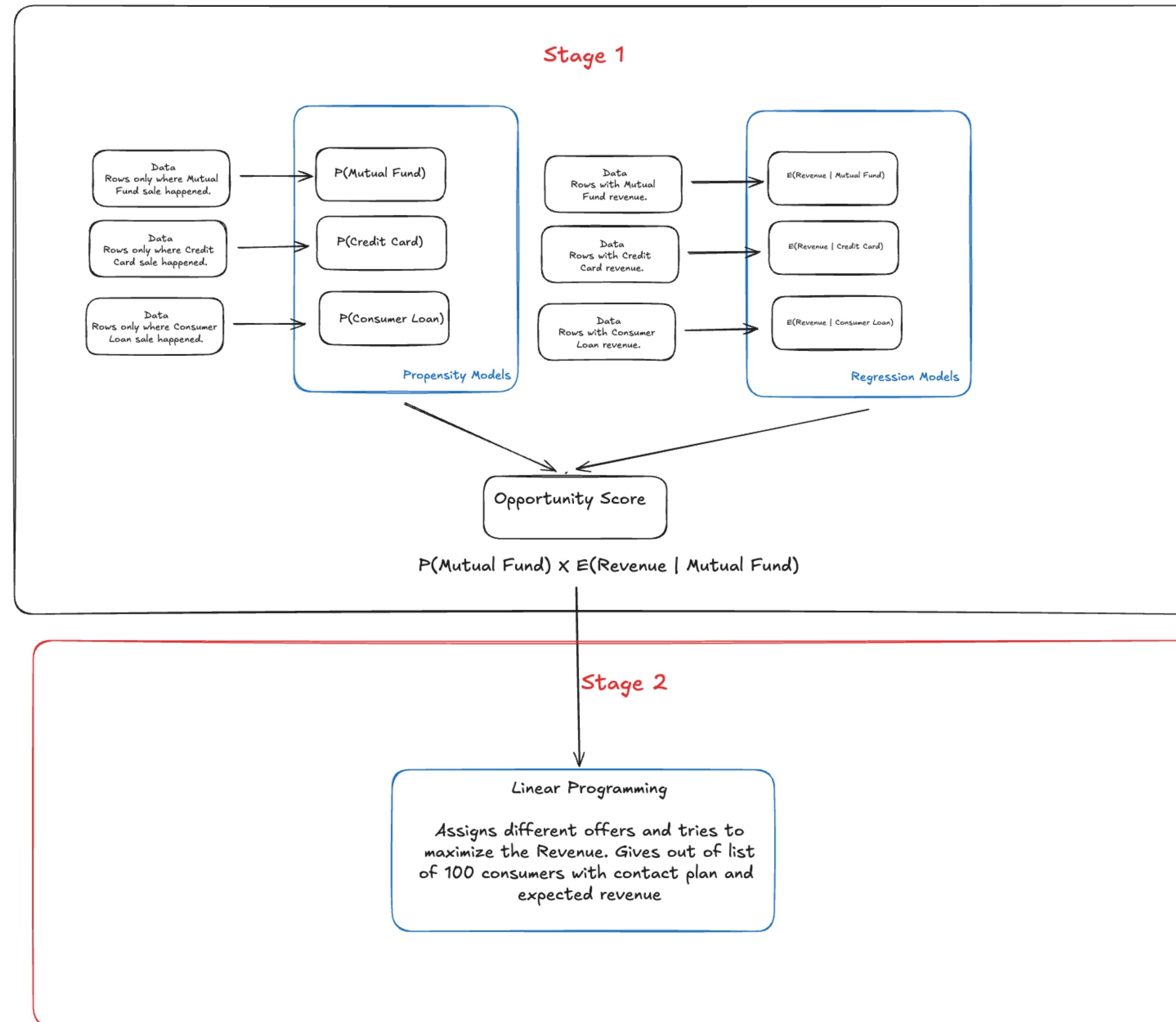
# Key Findings

- Mutual Funds and Consumer Loans show the widest range and highest values, indicating they are high-value products.
- Credit Card and Overdraft balances are concentrated at lower values.
- Sales Revenue of Mutual Fund, Credit Card and Consumer Loans were extremely right skewed.



# Modelling Approach

# Two Stage Modelling





# Two Stage Modelling

- **Stage One (Prediction Stage)**
  - **Prediction Stage (Propensity Models)**
    - Predicts Probability of a consumer buying a product (Credit Card, Mutual Fund or Consumer Loan)
    - Method : Train 3 separate classification models which predicts probability to buy.
  - **Revenue Modelling Stage (Regression Models)**
    - Predicts revenue from a user once they buy a product (Credit Card, Mutual Fund or Consumer Loan)
    - Method : Train 3 separate regression models with forecasts the user revenue.
- **Stage Two (Linear Programming Stage)**
  - Incorporates linear programming to optimise the consumer contact plan, keeping in all the constraints.

# Modelling Results

# Propensity Models Performance

Xgboost	Roc-AUC	F1 Score	Recall	Precision
Mutual Fund	0.5024	0.3014	0.5641	0.2056
Credit Card	0.5304	0.3030	0.3125	0.2941
Consumer Loan	0.6202	0.4928	0.5862	0.4250

# Regression Models Performance

Xgboost	MAE	RMSE	R2 Score
Mutual Fund	10.2576	18.6216	-0.3041
Credit Card	5.5560	10.5454	-0.1755
Consumer Loan	7.6468	17.9013	-0.0612

# Final Results

# Contact Plan

Product	Client Count	Revenue
Mutual Fund	15	40.970592
Consumer Loan	65	642.699463
Credit Card	20	83.309937

Expected Revenue - € 767

# Next Steps

- Improvement in Regression Models
- More feature engineering
- Ensemble Techniques
- More data
- Improvement in Linear Programming constraints.