

# Executive Summary

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## Objective

This document contains an overview of the plan to improve revenue. This is done through direct marketing campaigns by identifying clients with the highest propensity to buy specific financial products: consumer loans, credit cards, and mutual funds. Multiple categories of customer data were employed: social-demographical, products owned + volumes, inflow/outflow on current account and sales + revenues from the proposed financial products.

## Client Targeting Strategy:

Given the constraint of targeting only 15% of the client base (approximately 100 clients), the strategy involves:

### Credit Card Offers:

Target clients with lower current account and saving account balances. These clients exhibit a higher propensity to purchase credit cards. When following this strategy, however, caution should be taken concerning default risk. Creditworthiness data could be beneficial to defining a worthwhile target group.

### Mutual Fund Offers:

Identifying the target demographic for mutual funds is more challenging. However, clients who engage in frequent transactions and already hold mutual funds exhibit a notable interest in purchasing additional mutual funds.

### Consumer Loan Offers:

For consumer loans, it is evident that customers with longer tenure and younger age demonstrate a higher interest. Additionally, individuals with lower balances in their current, credit, and savings accounts appear to be more inclined towards consumer loans. Therefore, the company should strategically target young individuals who have established a significant tenure with the company.

## Revenue estimates

The average revenue per customer is as follows:

- EUR 9.66 for mutual funds
- EUR 10.86 for credit cards
- EUR 12.04 for consumer loans

Given the constraint of targeting only 15% of the client base, the majority of offers should be directed towards prospects for consumer loans, followed by credit cards and mutual funds. Considering the customers' propensities to purchase, this strategy could potentially result in additional revenue of EUR 1,227. Additionally, certain clients contribute significantly to the total

revenue. These high-value outliers are challenging to identify through conventional models, thus warranting a more detailed investigation. An in-depth analysis of these customers could yield substantial benefits.

## **Attachments**

Target customers lists:

- Mutual funds: MF\_targets\_list.csv
- Credit cards: CC\_targets\_list.csv
- Consumer loans: CL\_targets\_list.csv

## Technical report

### Data

A basetable was created by joining the abovementioned data categories. Some missing values were imputed by 0. Box plots of the revenues showed many outliers, contributing significantly to the total revenue.

### Propensity models

Two model categories were compared: logistic regression using lasso penalty and random forest. After careful tuning, logistic regression was selected for the credit card (CC) and consumer loan (CL) models. Random forest was employed for the mutual fund (MF) model. This resulted in the following balanced accuracy values on test data (80/20 train-test split):

- MF:0.55
- CC: 0.55
- CL: 0.64

As the data set was relatively small, Shapley values were employed for interpretation. The following plots were made using SHAP and show the impact of each feature on the model output:

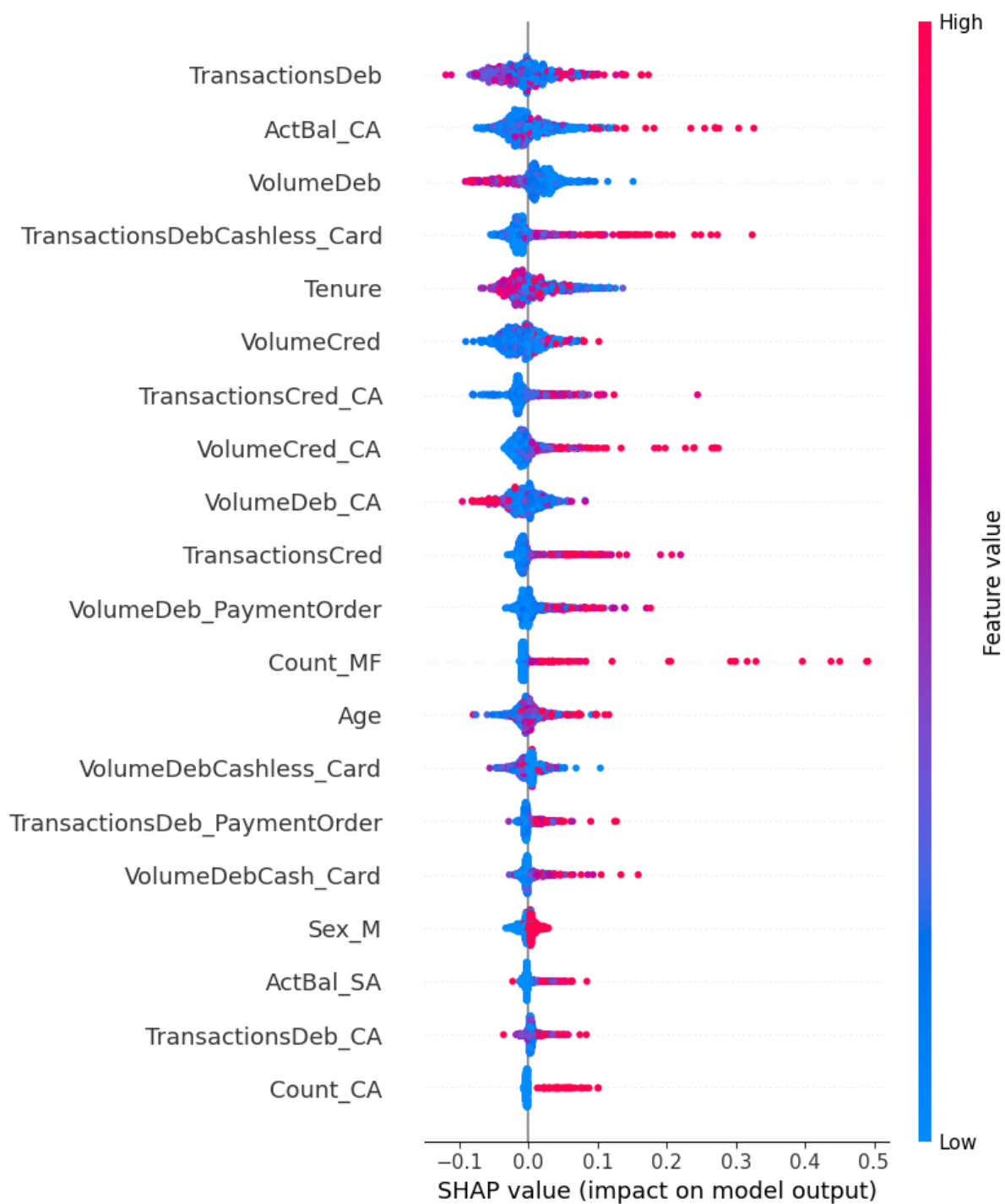


Figure 1: SHAP plot for mutual fund

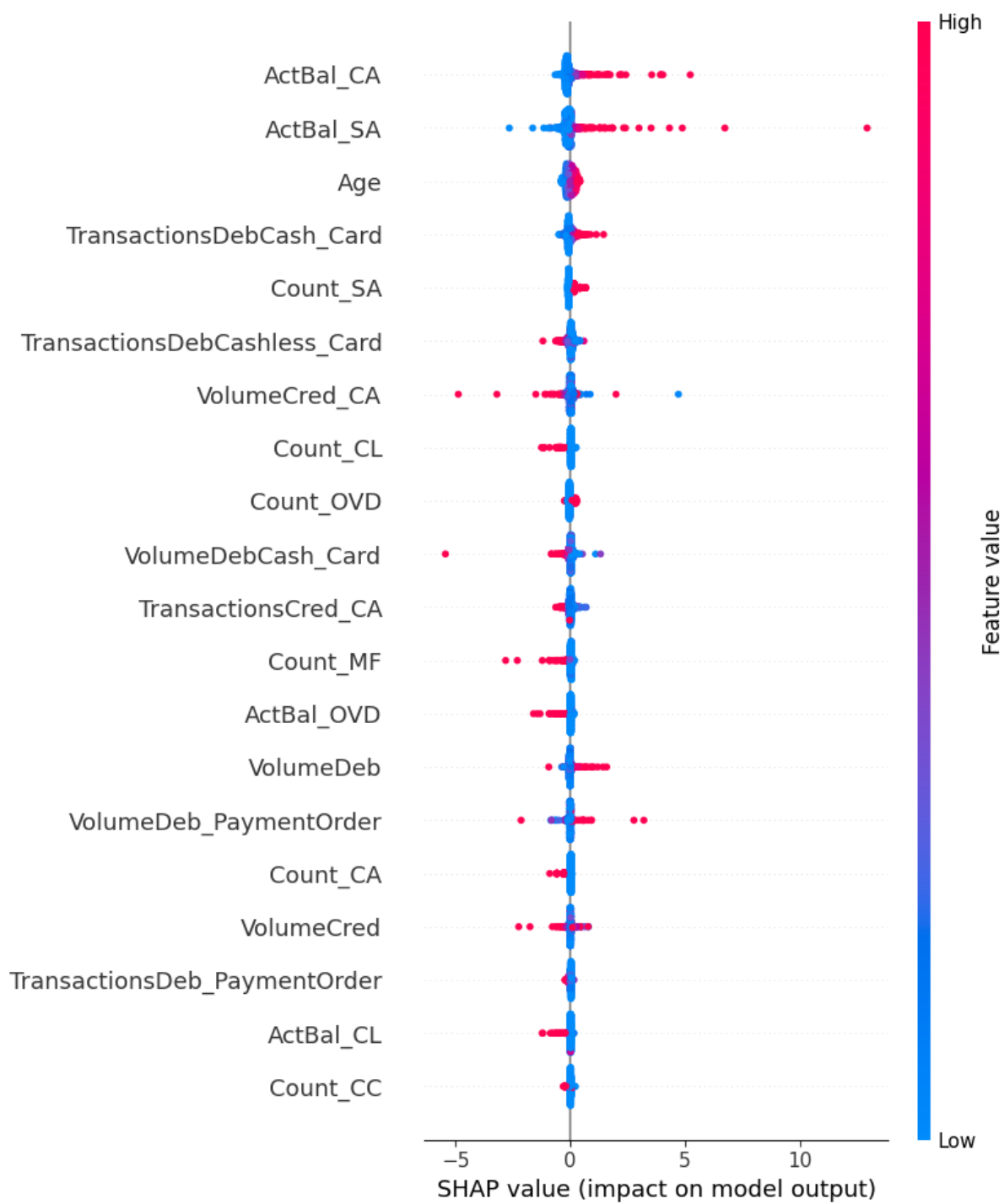


Figure 2: SHAP plot for credit card

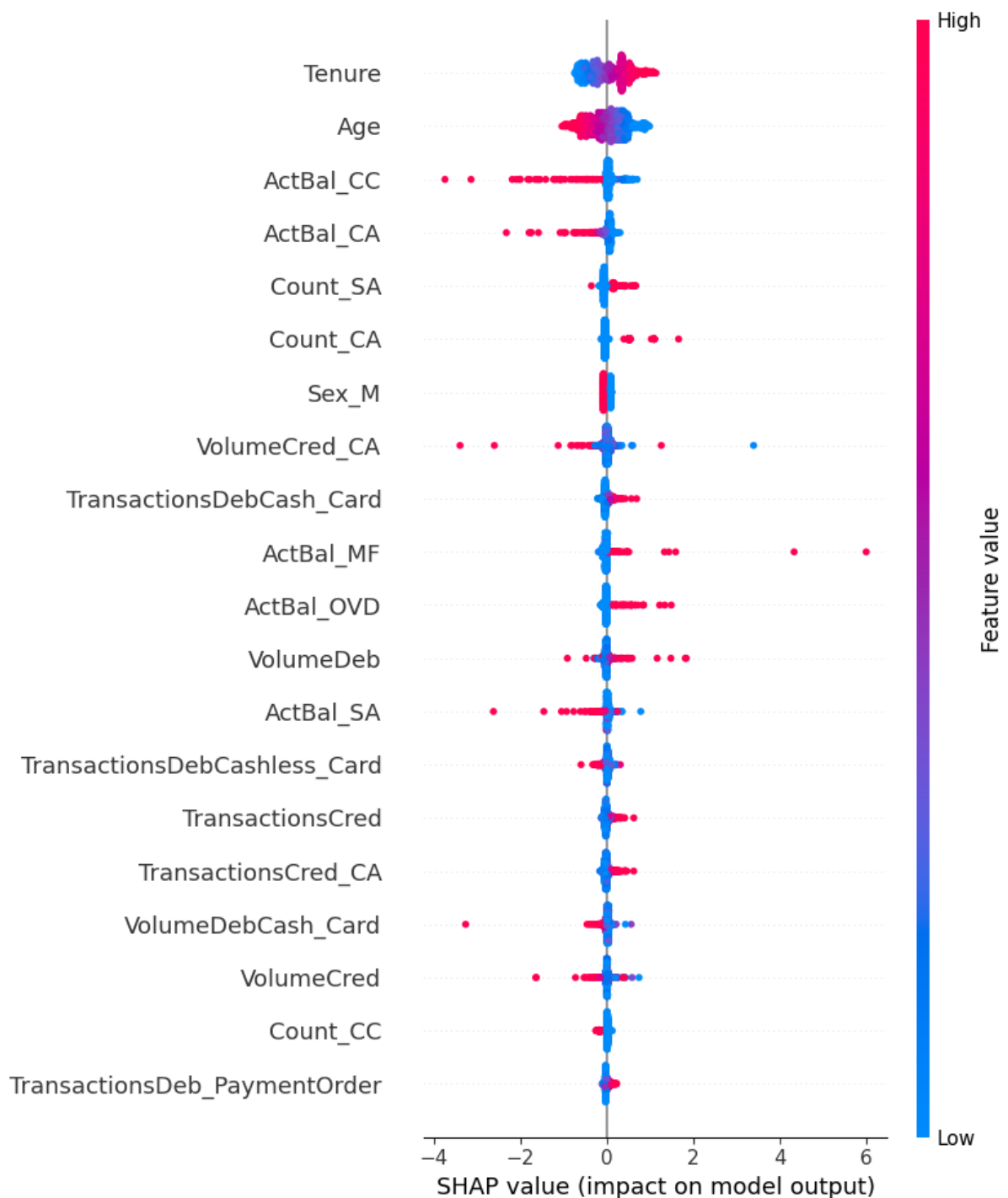


Figure 3: SHAP plot for consumer loan

### Revenue models

An attempt at modelling the revenues per customer and product was done using Lasso regression. This resulted however in all coefficients being 0, meaning that the independent variables contain no useful information for predicting the revenue and that the mean revenue is used as prediction. The propensity model was then combined with the expected revenues per product by multiplication. This model was deployed on the test set to compare the obtained revenue when targeting the top 15% as ranked by the model to randomly selecting 15% of the

customer base. This resulted in a potential revenue increase of EUR 132 (~ EUR 4 per targeted customer).