

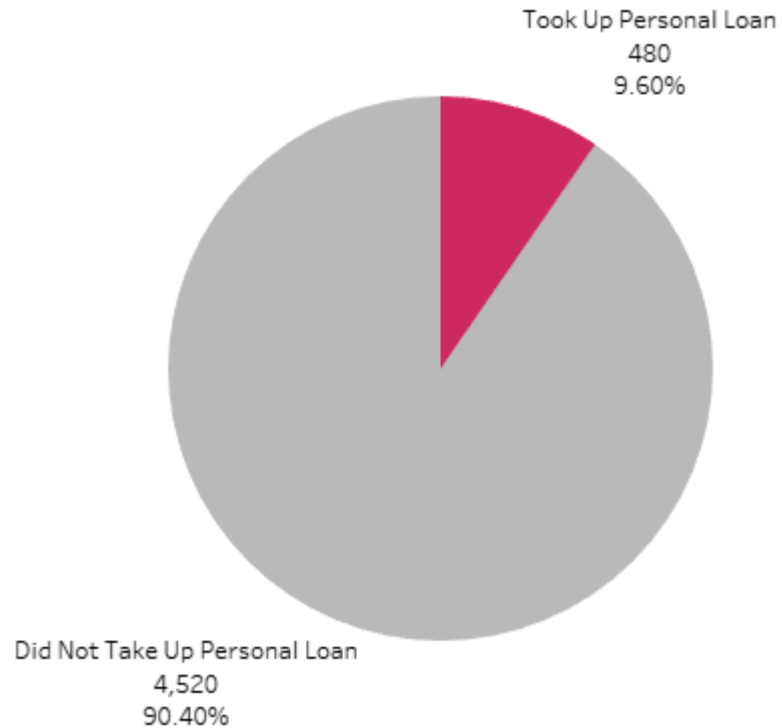


CAPSTONE PROJECT

PERSONAL LOAN CAMPAIGN

By Jeslyn Lee Jie Lin
For Vertical Institute, Data Analytics Course

PROBLEM STATEMENT

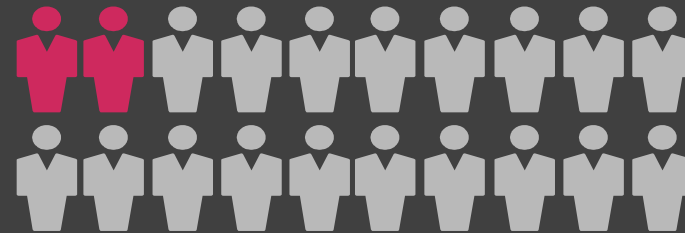


Refer: Tab 1 of [Personal Loan Conversion | Tableau Public](#)

During the last campaign where a personal loan was offered to 5,000 of the bank's customers, the take-up rate was only 9.6%.

To improve the take-up rate in the next campaign, the bank studies the correlation between the customer's information such as income, education level, credit card spending, existing accounts with the bank and the acceptance of personal loan offers.

This way, the bank can devise a strategy based on the profiles of customers who are more likely to take up the personal loan offer.



DATA DICTIONARY

The data set is downloaded via Kaggle – [Personal Loan Modeling](#) – with information on 5,000 customers from Thera Bank.

In the original data set, there are a total of 14 columns as indicated on the right.



Fields

| | | | |
|------------|--|--------------------|---|
| ID | Customer ID | Education | Education level of the customer |
| Age | Customer's age in completed years | Mortgage | Value of house mortgage in thousands, if any |
| Experience | Number of years of professional experience | Personal Loan | If customer took up personal loan in the last campaign |
| Income | Annual income of the customer in thousands | Securities Account | If customer has a securities account with the bank |
| ZIP Code | Home address ZIP Code | CD Account | If customer has a certificate of deposit with the bank |
| Family | Family size of the customer | Online | If customer uses the bank's internet banking facilities |
| CCAvg | Average spending on credit cards per month, in thousands | CreditCard | If customer has a credit card issued by the bank |

DATA CLEANING

Data cleaning was done on the following five data fields to reflect data that are easier to understand when preparing the relevant charts/graph:



Education



Online



Securities Account



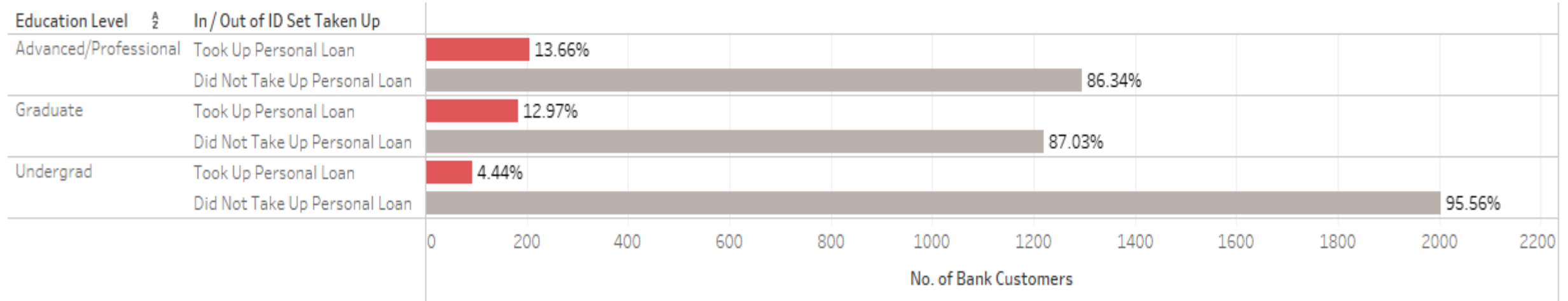
CreditCard



Account

EDUCATION LEVEL

Education vs Conversion



Refer: Tab 3 of [Personal Loan Conversion | Tableau Public](#)

13.66%
of customers with
advanced/professional education

and

12.97%
of customers
who are graduates

took up the personal loan offer.

While the data shows that undergrad customers are less likely to take up a personal loan than customers who are graduates or with advanced/professional education, this finding does not substantiate a correlation between the level of education and the personal loan take-up rate.



SPENDING & INCOME

6

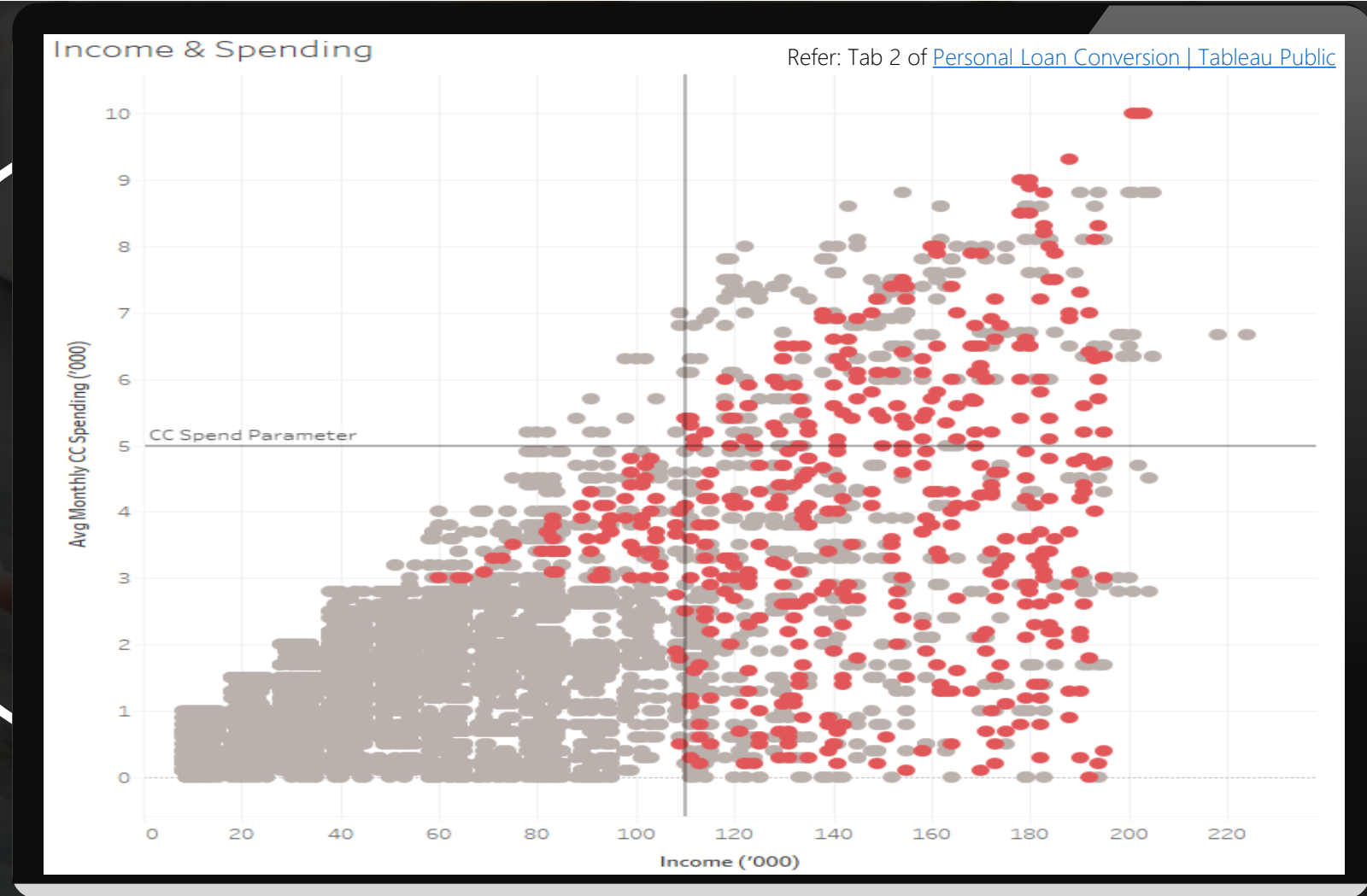
There is no proven correlation between the average monthly credit card (CC) spending and the personal loan take-up rate. High-income earners with meagre credit card spending are shown to have taken up the personal loan offer.



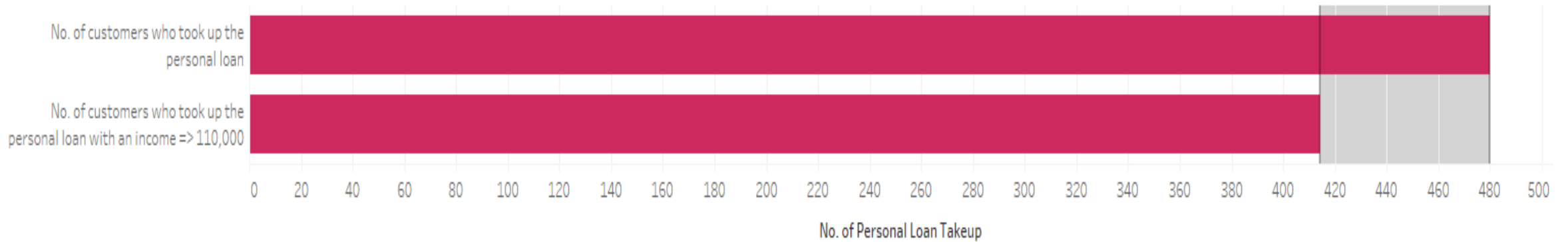
There is a significant increase in the personal loan take-up rate for customers with an income of 110k and above.



From the graph on the right, we can confidently say that people with lower income are much less likely to take up a personal loan, contrary to stereotypical belief.



HIGHER INCOME, HIGHER CONVERSION

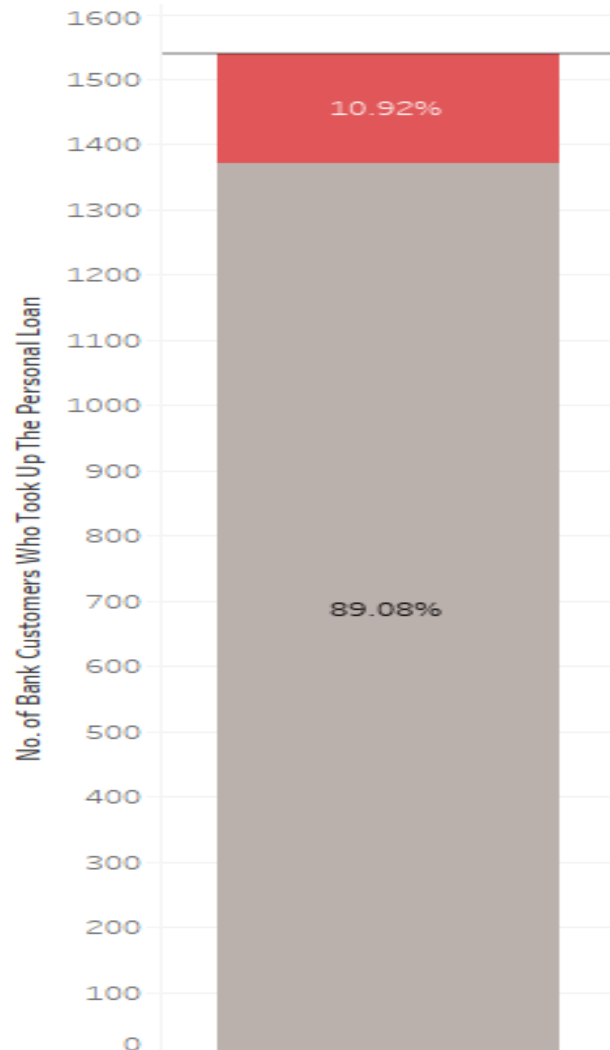


Refer: Tab 5 of [Personal Loan Conversion | Tableau Public](#)

86.25%
(414 out of 480)

of customers who took up the personal loan offer were earning an income of 110k and above.

MORTGAGE



Refer: Tab 6 of [Personal Loan Conversion](#) | Tableau Public

Of the 5,000 customers eligible for the last campaign, 1,538 (aka. 30.76%) had a mortgage.

Only 168 (aka. 3.36% of the total) customers with a mortgage took up the personal loan offer. This makes up 35% of the take-up rate in the last campaign.

10.92%

Customers who had mortgages took up the personal loan offer.

89.08%

Customers who had mortgages did not take up the personal loan offer.

There is no proven correlation between a customer having mortgage and the personal loan take-up rate.

CUSTOMER RELATIONSHIP

9

| Any Credit Card | Any Cert Deposit Account | Any Online Banking | Any Securities Account | Took Up Personal Loan | Did Not Take Up Personal Loan |
|-----------------|--------------------------|--------------------|------------------------|-----------------------|-------------------------------|
| Yes | Yes | Yes | Yes | 11.63% | 88.37% |
| | | | No | 52.17% | 47.83% |
| | | No | Yes | 58.33% | 41.67% |
| | | | No | 100.00% | |
| | No | Yes | No | | 100.00% |
| | | | No | Yes | |
| | | | No | 9.49% | 90.51% |
| | | | | | |
| No | Yes | Yes | Yes | 67.39% | 32.61% |
| | | | No | 100.00% | |
| | | No | Yes | 100.00% | |
| | No | Yes | Yes | | 100.00% |
| | | | No | 8.90% | 91.10% |
| | | No | Yes | 6.38% | 93.62% |
| | | | No | 9.03% | 90.97% |
| | | | | | |

Refer: Tab 4 of Personal Loan Conversion | Tableau Public

We would think that the more engaged a customer is with the business, the more it means that the customer trusts the business. Trust could be an indicator of the personal loan take-up rate.

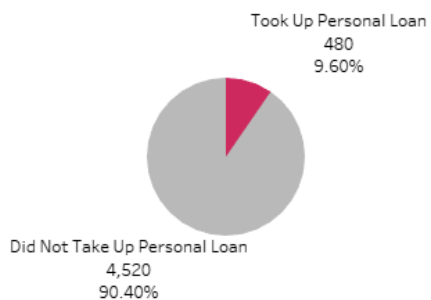
However, there is no proven relationship between a customer having multiple accounts with the bank and the personal loan take-up rate.

For example, only 11.63% of customers who had a credit card, a certificate of deposit, an online banking facility and even a securities account with the bank took up the personal loan offer.

At the same time, 9.03% of customers who did not have any credit card, certificate of deposit, banking facility or securities account with the bank took up the personal loan offer. The difference is only 2.6% less than the group of existing customers holding multiple accounts with the bank.

DASHBOARD

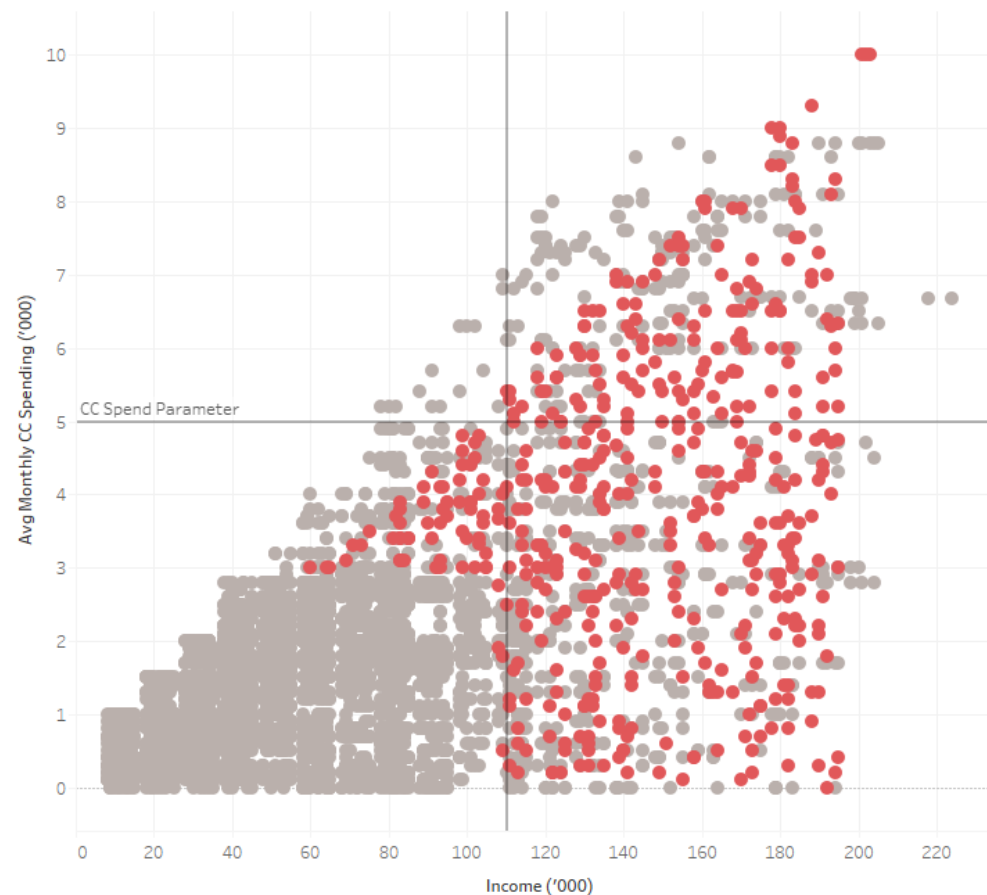
Takeup Rate of the Personal Loan Offer



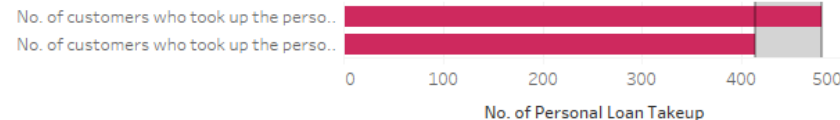
In / Out of ID Set Taken Up

■ Took Up Personal Loan
■ Did Not Take Up Personal Loan

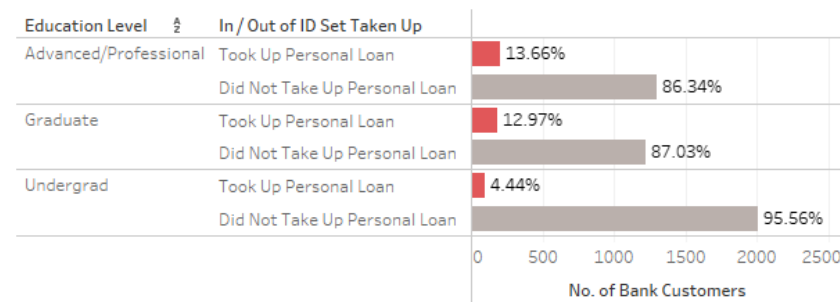
Income & Spending



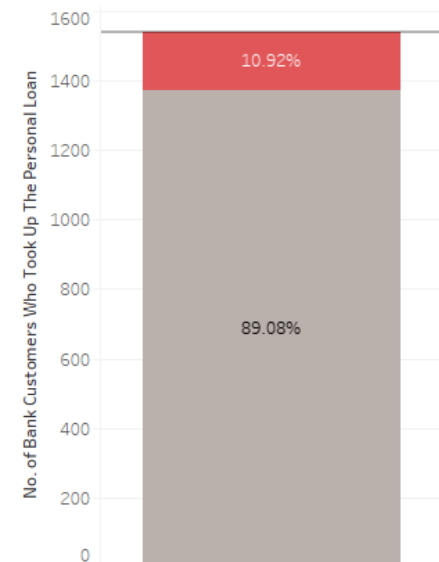
Higher Income, Higher Conversion



Education vs Conversion



Mortgage vs Conversion

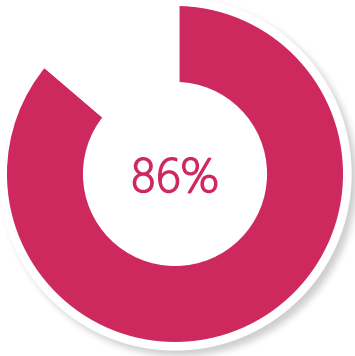


Existing Accounts with the Bank

| | | | | In / Out of ID Set Taken Up | |
|-----------------|---------------------|--------------------|-----------------|-----------------------------|-----------------|
| Any Credit Card | Any Cert Deposit .. | Any Online Banking | Any Securitie.. | Took Up Pers.. | Did Not Take .. |
| Yes | Yes | Yes | Yes | 11.63% | 88.37% |
| | | | No | 52.17% | 47.83% |
| | | No | Yes | 58.33% | 41.67% |
| | | | No | 100.00% | |
| | No | Yes | No | | 100.00% |
| | | | Yes | | 100.00% |
| | | No | No | 9.49% | 90.51% |
| | | | Yes | 67.39% | 32.61% |
| No | Yes | Yes | No | 100.00% | |
| | | | Yes | 100.00% | |
| | | No | No | 8.90% | 91.10% |
| | | | Yes | 6.38% | 93.62% |
| | No | Yes | Yes | 8.90% | 91.10% |
| | | | No | 9.03% | 90.97% |

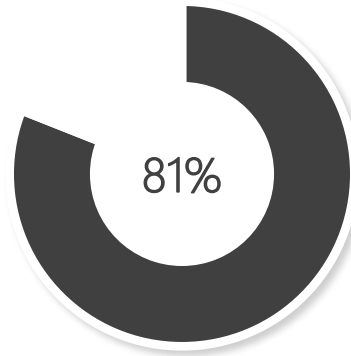
Refer: Dashboard 1 of [Personal Loan Conversion | Tableau Public](#)

SUMMARY



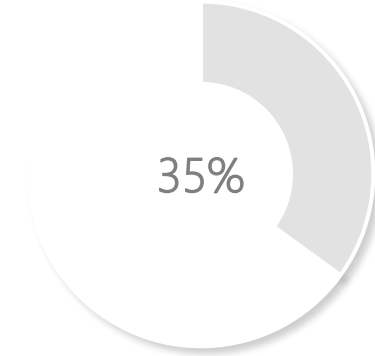
Income

Customers who took up the personal loan are earning an income of 110k and above.



Education

Customers who took up the personal loan offer had an education level of advanced/professional or is a graduate.



Mortgage

Customers who took up the personal loan offer had a mortgage.



RECOMMENDATION

The next campaign can be targeted at customers with:



Minimum income of 110k; and



An education level of advanced/professional/graduate;



But need not necessarily have a mortgage.

This would help divert a substantial amount of unnecessary business expenses and focus on strategies to enhance the success rate of customers accepting personal loan offers.



THANK
YOU

