Predicting financial hardship with machine learning at ANZ

The objective of this project was to use **ANZ's large amount of data** to engineer **novel features** and use them to train a machine learning model to **predict financial hardship**.

Background

ANZ created the Good Customer Outcomes team to ensure ANZ was effectively prioritising and meeting its customer's needs.

The purpose of this project was to create a model which predicts customers at risk of future financial struggles so that ANZ to provide pre-emptive support and prevent unfavourable outcomes.

With the current system, ANZ can only identify customers who are already experiencing financial difficulties and hardship.

Financial struggle

Two classes of financial struggles, which differ in severity, are financial difficulty and financial hardship. Financial difficulty is when a customer shows is missing repayments, has excess arrears and a marginal transactional history. Financial hardship occurs when they show signs that they are at risk of defaulting.

Methodology

Steps

1. Create new features
2. Feature engineering
3. Machine learning

Quick data facts

15,000 people in hardship
1.8 million customers
1.5 billion transactions
100+ features

Machine learning

The performance of 10 different models was measured using the F1 score as it optimises for both recall and precision. Ten-fold cross validation was used.

Best performing models

	Type	F1 score	Recall	Precision
Difficulty	Random forest	0.975	0.955	0.995
Hardship	Random forest	0.554	0.425	0.802

Next steps would be to tune the model and improve its predictive performance.

UC UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha CHRISTCHURCH NEW ZEALAND

DATA601
2022
By: Ally Hassell
UC supervisor: James Williams

Sponsored by ANZ

Predicting financial hardship with machine learning at ANZ

The objective of this project was to use **ANZ's large amount of data** to engineer **novel features** and use them to train a machine learning model to **predict financial hardship**.

Background

ANZ created the Good Customer Outcomes team to ensure ANZ was effectively prioritising and meeting its customer's needs.

The purpose of this project was to create a model which predicts customers at risk of future financial hardship so that ANZ to provide pre-emptive support and prevent unfavourable outcomes.

Financial hardship

A customer is experiencing financial hardship when they show signs that they are at risk of defaulting, such as missing repayments, excess arrears and marginal transactional history. When a customer is in financial hardship they are actively monitored and managed by bank.

This system means ANZ can only identify customers who are currently experiencing financial hardship.

Methodology

Steps

1. **Extraction and wrangling**
2. **Feature engineering**
3. **Machine learning**

Quick data facts

140,000 people in hardship
4 million customers
1.5 billion transactions
Xxx features

Results

Xxx

Next steps would include additional novel financial hardship features to improve recall. One possibility is percentage of income that is spent on home loans/rent.

UC UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha CHRISTCHURCH NEW ZEALAND

DATA601
2022
By: Ally Hassell
UC supervisor: James Williams

Sponsored by ANZ