SMU SINGAPORE MANAGEMENT UNIVERSITY

HONG LEONG FINANCE

SMU-X

PROJECT STATEMENT

According to the 2018's annual report , 93% of HLF's net profit is derived from interest-related activities. As a result, changes in the macroeconomic and their indicators (such as inflation rate, PMI) can influence interest rate in Singapore and directly impact HLF's net profit.

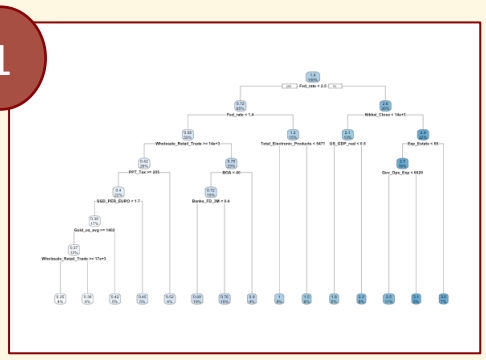
Having an insight into future interest rate can help HLF's management be prepared for interest movement and undertake contingent activities to mitigate the undesirable effect.

OBJECTIVE:

"To predict SIBOR rates and to identify macroeconomic factors related to domestic interest rates"

ANALYSIS

1

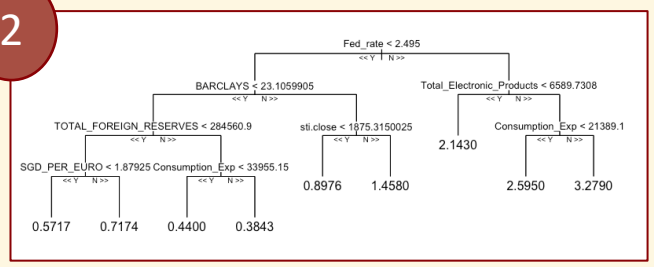


Regression tree model

Utilises a decision tree method as a means of prediction. Due to its robust governing criteria model, it can be used as a reliable machine learning.

RMSE: 0.5109812

2

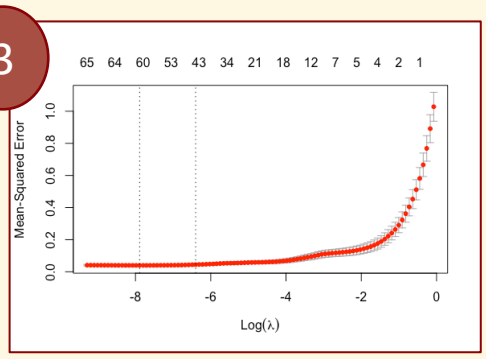


Random forest model

Uses multiple decision trees to carry out class prediction based on a voting model, and the most voted model will be the predicted result.

RMSE: 0.4766873

3



LASSO model

Aims to minimise the sum of squared errors to come to a central predicted outcome. This model outperformed the other models for the analysis.

RMSE: 0.2521927

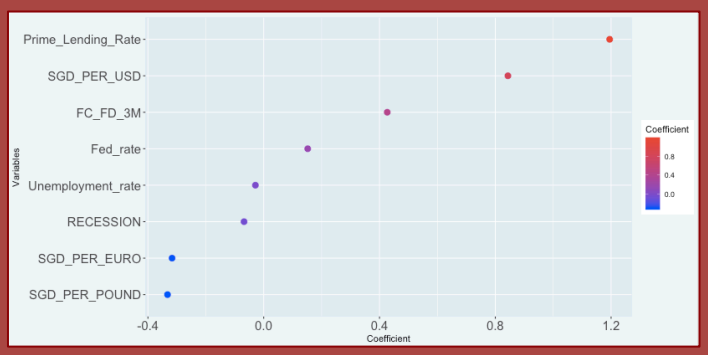
Ensemble Model

The three best models were merged by assigning weightage to possibly gain the ability to predict SIBOR and other domestic interest rates. By using ensemble, it helps to stabilize predictions by limiting the effect of errors or outliers by any one model

Regression tree = 0.14 Random forest = 0.15 LASSO model = 0.71

RMSE: 0.1898537

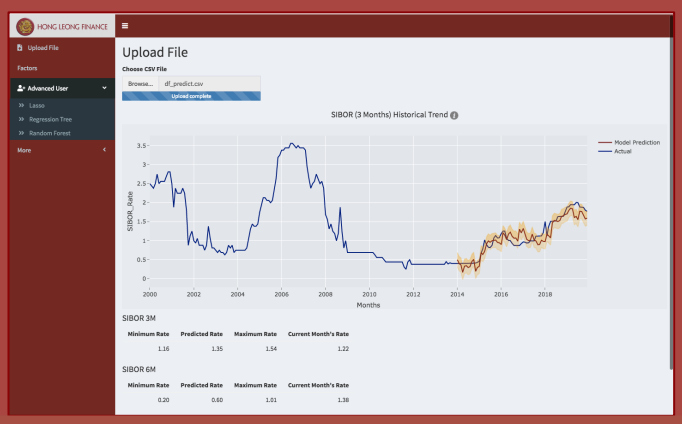
KEY FINDINGS



Based on the analysis done, the following macroeconomic factors were identified to be affecting the interest rates:

1) Foreign exchange rates
2) Federal funds rates
3) Recession
4) Domestic interest rates
5) Unemployment rate

WEB APPLICATION



Our team developed a web application using RShiny to have a more user-friendly environment. HLF will be able to upload a CSV file with the required variables to predict the interest rate. The application will allow the user to compare the predicted rate with the historical rates as well as explore different models used in predicting.

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