

Using Data to Effectively Maximize Bank Telemarketing Campaigns

Springboard Capstone 1 Project

by

Crystal Chen

Overview

- Banks need to raise funds to invest in order to increase profits, attracting investors and borrowers. One method is opening new term deposit accounts.
- Using data collected from previous marketing campaigns, we can predict the probability of individuals opening new accounts with an accuracy greater than 75%, depending on what model is used.
- The models suggest that the status of clients (age, career, etc.) matter less than economic variables (Euribor, employment rate, etc.).
- When economic conditions reach specific points, clients are more likely to open term deposit accounts.

Banking Industry Performance Measurements

- Average Number of Products Held by Each Consumer
 - Higher the average better the ranking for the banks.
- Opening New Term Deposits
 - Allow banks to invest at a higher rate of return and lend collecting net interest margins.
- Increasing Profitability
 - Using funds to increase profitability through investing and loans to borrowers.

Marketing Methods

- Telemarketing
- Electronic Communications
- Advertising
- In Branch Marketing
- These methods can be hit or miss, but we could increase success rate by placing priority to those with higher probability of opening a term deposit account.

Purpose of Research

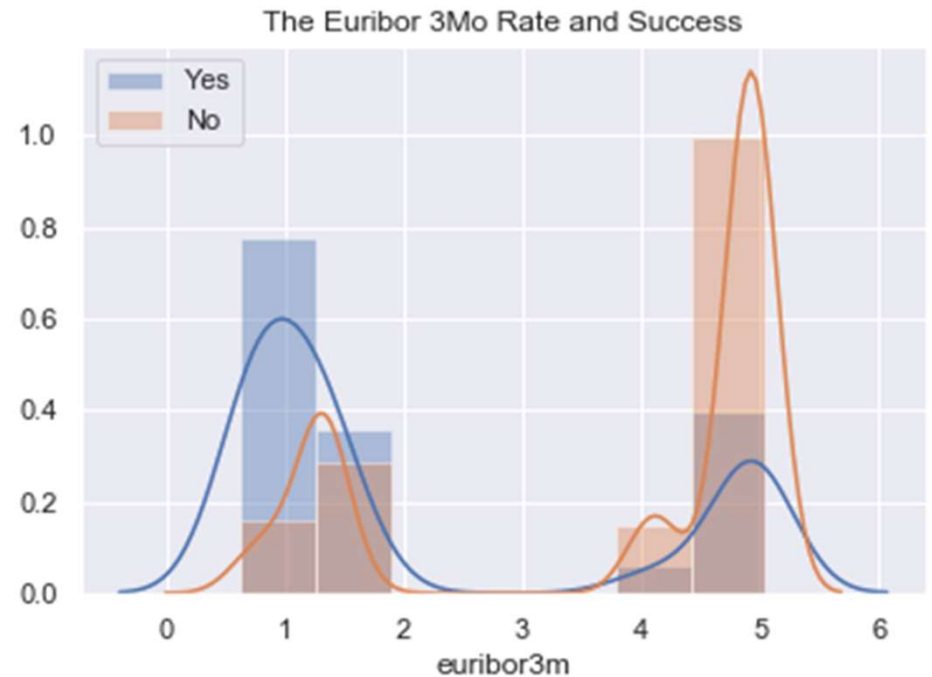
- Use data to predict which consumers have a higher probability chance of subscribing to a new term deposit.
- Allows bank to allocate resources to better optimize and maximize success rate outcome.
- Suggest further research to improve success of model predictions.

Data Markers: 41,188 Entries 2008-2013

- Age
- Job
- Marital Status
- Education
- Previous Loan Default
- Housing Loan
- Loan
- Contact Month/Day
- Previous Marketing Outcome
- Employment Variation Rate (quarterly)
- Consumer Price Index (mo)
- Consumer Confidence Index (mo)
- Euribor (3 month rate)
- Number of Employees (quarterly)

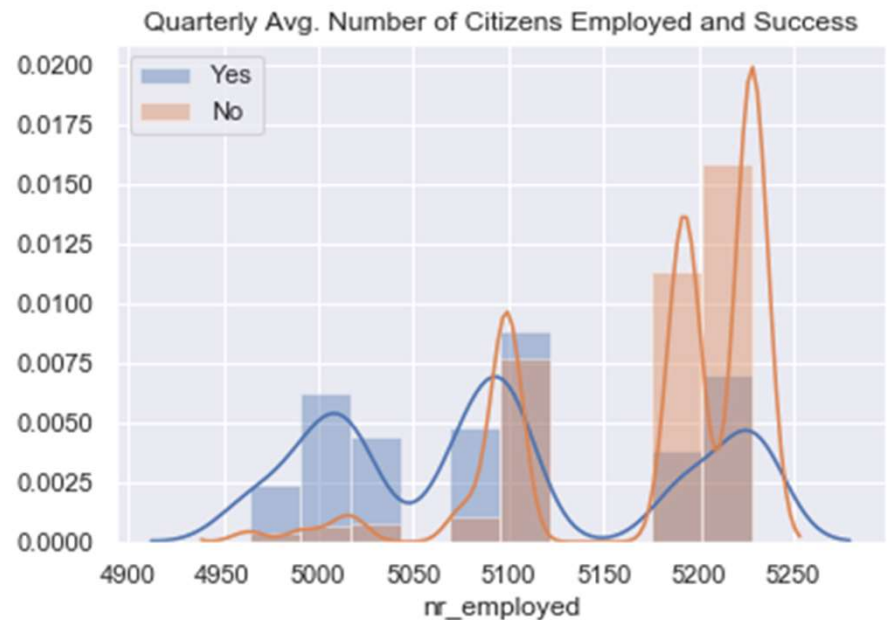
Data Trends

- One of the highest indicators is the rate of The Euribor. Most new subscriber term deposits were open during high Euribor rates.
- Finding the optimal interest rate while remaining profitable is important for opening new term deposits.



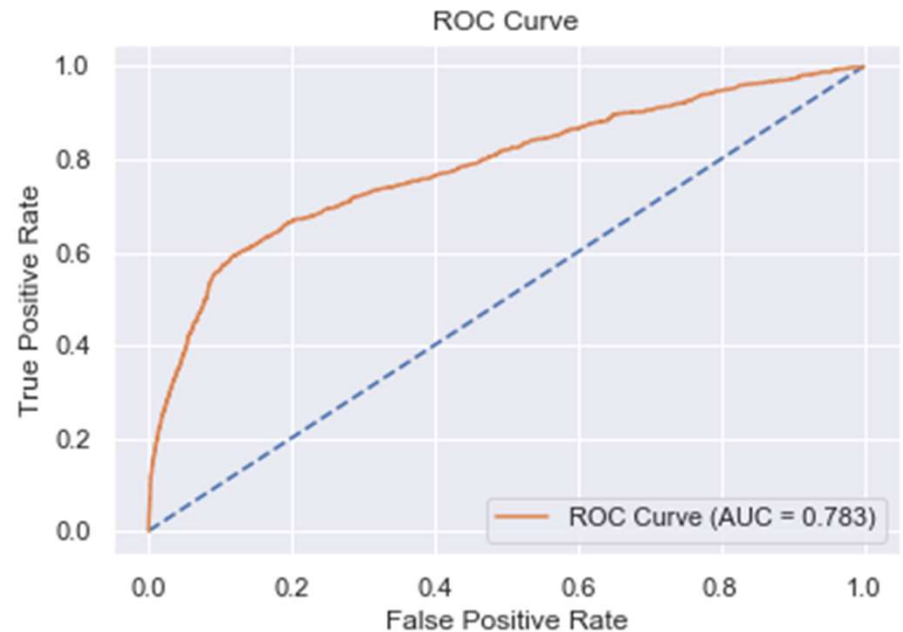
Data Trends

- Employment is a high indicator of when new term deposit accounts were opened.
- The higher the employment, the less likely clients opened accounts.
- The higher average of employed citizens, the higher the rejection for new term deposits.

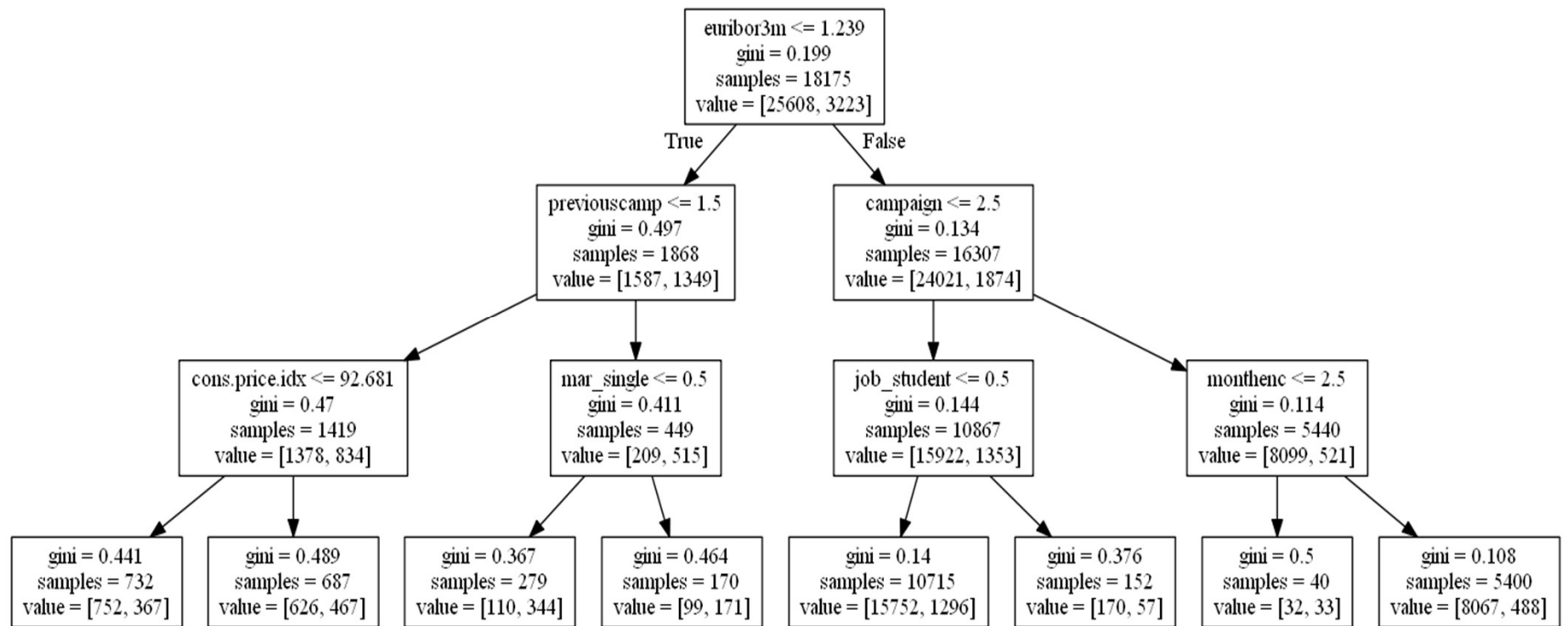


Predicting Probability of Successful Call

- Use collected data to train models predicting the outcome of a marketing call. Clients either sign up for a term deposit or decline.
- Using the Random Forest Classifier, the model has an accuracy of 89.9%
- Model has a 78.3% of distinguishing between success and failure.

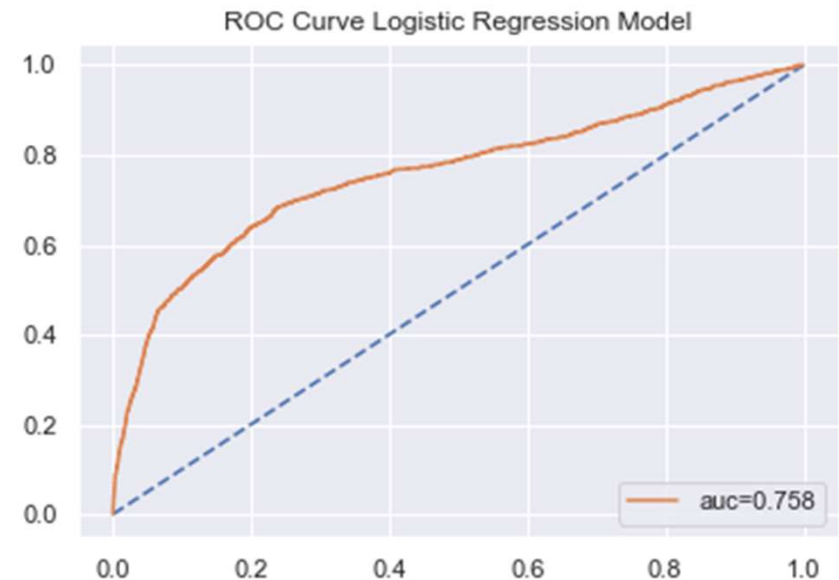


Random Forest Classifier



Logistic Regression Model

- Logistic Regression Model has an accuracy of 89%
- Model has 75.8% ability of distinguishing between success and failure of marketing calls.



Conclusion

- Each model shows that the features of importance are not related to the client, but environmental factors such as the Euribor and average employment.
- Insert feature importance image

Conclusion and Limitations

- Each model provided above 75% accuracy in predicting the outcome of a marketing call.
- If market conditions are not optimal, banks should focus marketing tactics and resources on other products, other than term deposits.
- Some limitations of this data are missing specifics such as exact date of call, exact values that are not quarterly or averages.
- Model can be further improved upon with excess data variables.