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Analysis of Complaints Received by CFPB for Big Banks' Association

Executive Summary

Consumer Financial Protection Bureau of the US is a government agency working for American Consumers, Providers and Economy as a whole. We protect consumers from unfair, deceptive, or abusive practices and act against companies that break the law. [1] One of the primary functions of the Bureau of Consumer Financial Protection (CFPB) is collecting, investigating, and responding to consumer complaints.

When consumers submit complaints online or over the phone, the CFPB asks them to identify the consumer financial product or service with which they have a problem, as well as the type of problem they are having with that product or service. This provides information that the CFPB can use to analyze complaints. The CFPB routes consumers' complaints about financial products and services—and any documents they provide—directly to financial companies, and works to get consumers a timely response, generally within 15 days. Consumers may then choose to dispute the resolution offered by the company.

The CFPB publishes the consumer's narrative description of his or her experience if the consumer opts to share it publicly and after the CFPB takes steps to remove personal information. This data is available publicly and available on CFPB's website. The data is in the public domain, has over 2 million anonymized recent records, and covers 6000+ financial providers of all varieties. It has a number of features, including a text narrative of the complaint.

The report created for the top 5 banks of the United States (in terms of assets) which are part of the Big Banks' Association is a description of key insights from the data problematic products, customers, etc. In some cases, customers dispute the explanations provided. In these situations, the bank has to perform additional investigations, and possibly offer further relief to the customers. As a result, the cost of dealing with disputes can be quite high, without including potential reputational damage and the risk of regulatory action. On average, it costs the banks \$100 to resolve, respond to and close a complaint that is not disputed. On the other hand, it costs banks an extra \$1500 to resolve a complaint if it has been disputed.

Create and evaluate a predictive model that can help the banks identify future disputes so they can perform "extra diligence" during the first round of addressing the complaint with a view to avoiding eventual disputes. If a complaint is picked up for "extra diligence", it costs the bank an extra \$90 to perform the additional diligence steps. This model helps to bring down the banks' spending on disputed complaints to \$300 from earlier \$1500.

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Introduction

- The Consumer Financial Protection Bureau is a 21st-century agency that implements and enforces federal consumer financial law and ensures that markets for consumer financial products are fair, transparent, and competitive. [1].
- Tandon Consulting analyzed the complaints received by the bureau from 2011 to December 1, 2021, and we were able to find several areas where improvements can be made.
- Before we proceed further, the Consumer Complaint Database contains data from all the banks in the United States, and for our analysis, we have reduced the data to only the top 5 banks [2] in the states.
- However, the company has tried to make as many comparisons as possible between the data of the top 5 banks and the rest of the banks in the US. The number of branches of each of these banks in the US are:

| Name of the Bank | Number of Branches |
|-----------------------|--------------------|
| Bank of America | 4,300 [3] |
| Citibank | 679 [4] |
| JPMorgan Chase & Co. | 4,700 [5] |
| U.S. Bancorp | 2,600 [6] |
| Wells Fargo & Company | 7,200 [7] |

- From the dataset, following fields were chosen to analyze and the target variable is 'Consumer Disputed?':

| Field name | Description |
|------------------------------|--|
| Product | The type of product the consumer identified in the complaint. For example, "Checking or savings account" or "Student loan." |
| Sub-product | The type of sub-product the consumer identified in the complaint. For example, "Checking account" or "Private student loan." |
| Issue | The issue the consumer identified in the complaint. For example, "Managing an account" or "Struggling to repay your loan." |
| Sub-issue | The sub-issue the consumer identified in the complaint. For example, "Deposits and withdrawals" or "Problem lowering your monthly payments." |
| Consumer complaint narrative | Consumer complaint narrative is the consumer-submitted description of "what happened" from the complaint. The CFPB takes reasonable steps to scrub personal information from each complaint that could be used to identify the consumer. |
| Company public response | The company's optional, public-facing response to a consumer's complaint. Companies can choose to select a response from a pre-set list of options that will be posted on the public database. |
| Company | The complaint is about this company. |
| State | The state of the mailing address provided by the consumer. |
| ZIP code | The mailing ZIP code provided by the consumer. |

| | |
|-------------------------------------|---|
| Tags | Data that supports easier searching and sorting of complaints submitted by or on behalf of consumers. |
| Consumer consent provided? | Identifies whether the consumer opted in to publish their complaint narrative. |
| Submitted via | How the complaint was submitted to the CFPB. For example, "Web" or "Phone." |
| Company response to consumer | This is how the company responded. For example, "Closed with explanation." |
| Timely response? | Whether the company gave a timely response. For example, "Yes" or "No." |

Key Findings

- In the last decade, over 2 million consumer complaints were received by the CFPB of which following are the data of the top 5 banks:

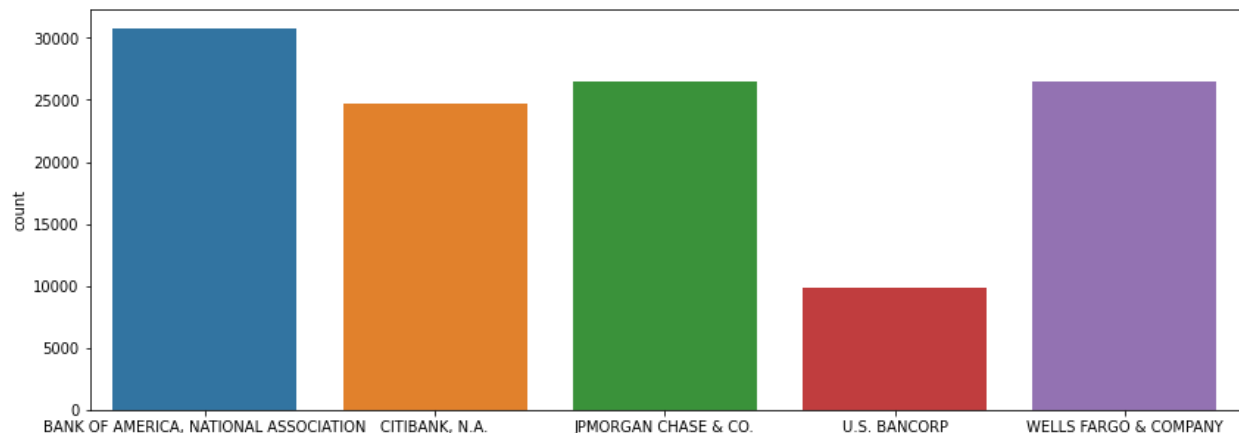


Figure 1: Bar Plot of Consumer Complaints received over 11 years of top 5 banks

- Since these are the five biggest banks in the US, it is safe to assume that they are dealing with a similar volume of transactions in their business. From the above graph, it is clear that U.S. Bancorp is leading the pack with the least number of consumer complaints while Citibank, JPMorgan Chase & Co., Wells Fargo & Company are second in line with consumer complaints ranging between 20000 – 25000 whereas Bank of America has dealt with the greatest number of consumer complaints i.e., over 30000 complaints over last 11 years.
- Across the 17 product categories, 93,500 consumer complaints were received from the top 5 banks which are just over 4.6% of all the complaints. The total number of complaints were approx. 120,000 of which 25000 complaints were not categorized in any of these 17 product categories. The top 3 products that received the majority share of the complaints by banks are mentioned in the table below:

| Bank | Product | | | Sum |
|---------------------------------------|--------------------------|----------|-----------------------------|-------|
| (# of complaints) | Checking/Savings Account | Mortgage | Credit Card or prepaid Card | |
| U.S. Bancorp | 2258 | 1638 | 3361 | 7257 |
| Wells Fargo & Company | 6440 | 8218 | 2451 | 17109 |
| Bank of America, National Association | 9131 | 7043 | 6365 | 22539 |
| Citi Bank, National Association | 67 | 227 | 2 | 296 |
| JPMorgan Chase & Co. | 7453 | 3748 | 7176 | 18377 |
| Sum | 25349 | 20874 | 19355 | 65578 |

- Citibank has surprisingly a very low number of complaints in all these pre-mentioned product categories. However, the number of complaints about Citibank is still on par with JPMorgan Chase & Co. and Wells Fargo & Company. Citibank has received the greatest number of complaints in none of the pre-mentioned product categories.
- The total amount of money spent by each bank to resolve all the complaints are depicted in the graph below:

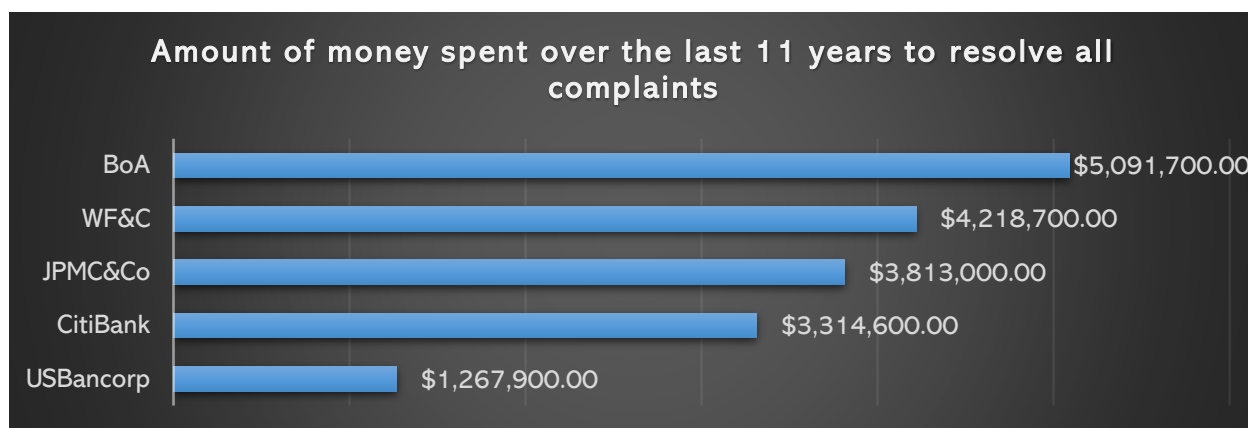


Figure 2: Bar Graph of Amount of money spent over the last 11 years to resolve all complaints

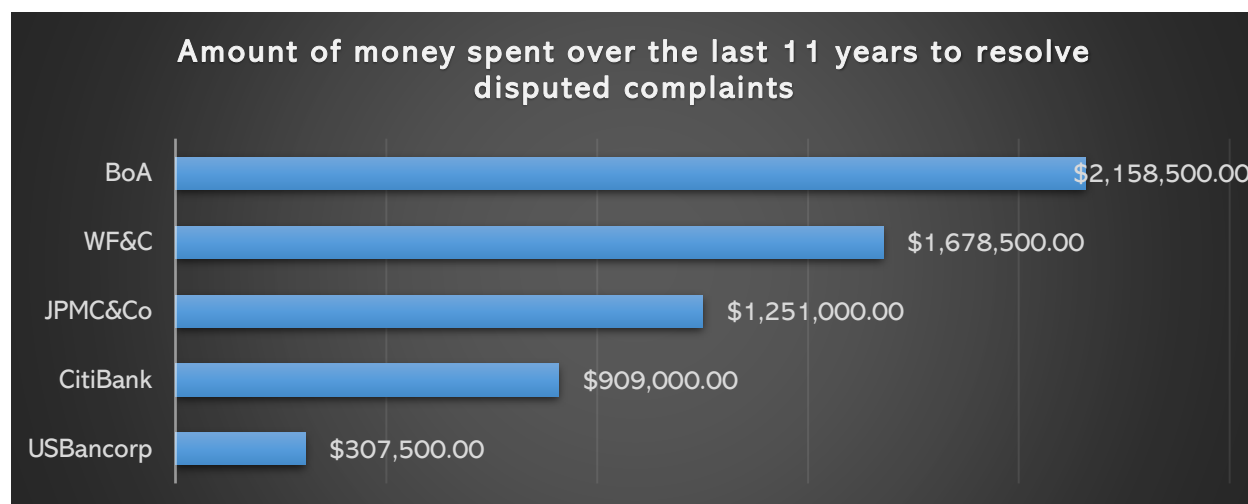


Figure 3: Bar Graph of Amount of money spent over the last 11 years to resolve disputed complaints

- As we know, once a consumer disputes a given solution, the bank spends an extra \$1500 to resolve the claim. The number of complaints over the last 11 years where banks had to spend an extra \$1500 resolving them and the resulting losses are:

| Bank | No. of Complaints Disputed | % of Complaints Disputed | Loss (Total cost to resolve the complaints) |
|-----------------------|----------------------------|--------------------------|---|
| U.S. Bancorp | 205 | 2% | \$307,500.00 |
| Citibank | 606 | 2% | \$909,000.00 |
| JPMorgan Chase & Co. | 834 | 3% | \$1,251,000.00 |
| Wells Fargo & Company | 1119 | 4% | \$1,678,500.00 |
| Bank of America | 1439 | 5% | \$2,158,500.00 |
| Total | 4203 | -- | \$6,304,500.00 |

- All the banks are spending a huge amount of money to resolve the disputes. Especially, the complaints that are disputed by customers have a fair share in the total amount of money spent by the bank. It is depicted in the graph below:

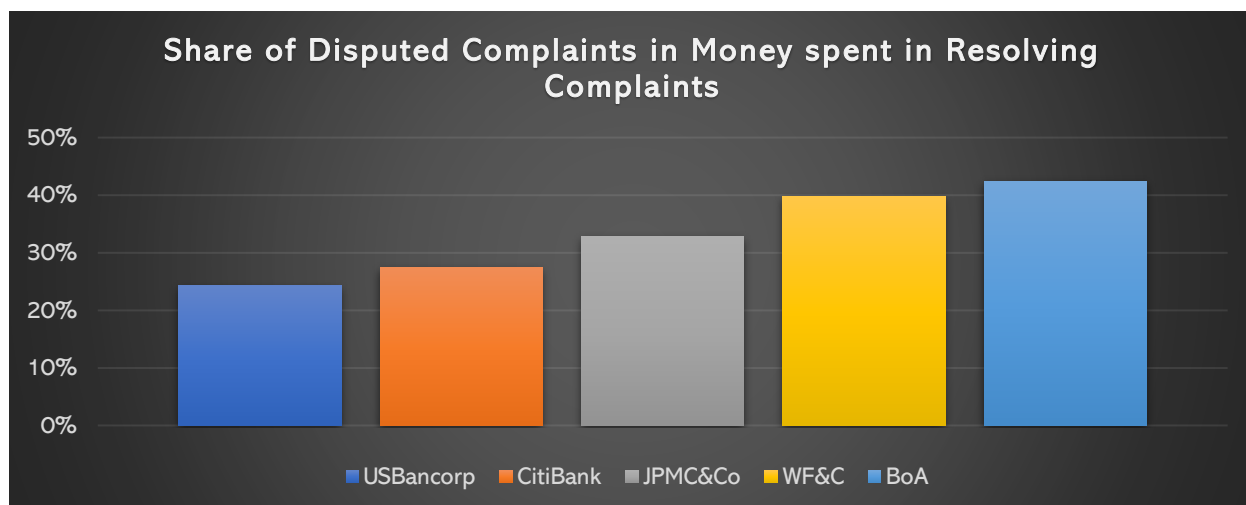


Figure 4: Share of Disputed Complaints in Money spent in Resolving Complaints

Extra Diligence and Recommendation:

- 4 of the 5 banks are spending \$1.5 million on average to resolve the complaints disputed by customers.
- However, with the help of machine learning models we have designed a system of predicting the future disputes.
- These complaints can be analyzed with extra diligence which only costs \$90 to bank which will avoid resulting in disputes which costs \$1500 to resolve.
- Several models were applied to the given dataset in order to obtain the model with maximum accuracy and the least false negative rate (predicting something as false when it is actually true).
- After using Logistic Regression, Extreme Gradient Boosting and Naïve Bayes Classifiers, it was found that all the models gave accuracy in the around 90%. However, the false negative rate and hence the recall varied significantly for all the models.
- With deliberation, training and testing the models on over 100,000 rows of data we can say that XGBoost model gave the accuracy of 91% with highest recall of 73%.
- In other words, we will be able to predict the complaints which requires extra diligence with 91% accuracy and minimize our spending on the resolving the complaints that are disputed. Putting this in numbers:

| Bank | Number of Complaints Disputed | Money Spent on resolving disputed complaint | Money spent on resolving the complaints after implementation of ML model |
|-----------------------|-------------------------------|---|--|
| US Bancorp | 205 | \$328,000.00 | \$64,964.50 |
| Citibank | 606 | \$969,600.00 | \$192,041.40 |
| JPMorgan Chase & Co. | 834 | \$1,334,400.00 | \$264,294.60 |
| Wells Fargo & Company | 1119 | \$1,790,400.00 | \$354,611.10 |
| Bank of America | 1439 | \$2,302,400.00 | \$456,019.10 |

- Savings over the years and average cost of complaint resolution comes down to:

| Bank | Savings | Average Cost per Complaint |
|-----------------------|----------------|----------------------------|
| US Bancorp | \$263,035.50 | \$316.90 |
| Citibank | \$777,558.60 | |
| JPMorgan Chase & Co. | \$1,070,105.40 | |
| Wells Fargo & Company | \$1,435,788.90 | |
| Bank of America | \$1,846,380.90 | |

- And hence, I recommend incorporating the ML predictor for analyzing the incoming complaints to bring down the average cost per disputed complaints from \$1500 to \$317.

Logic

- The logic used behind generating the report and the extra diligence part is:

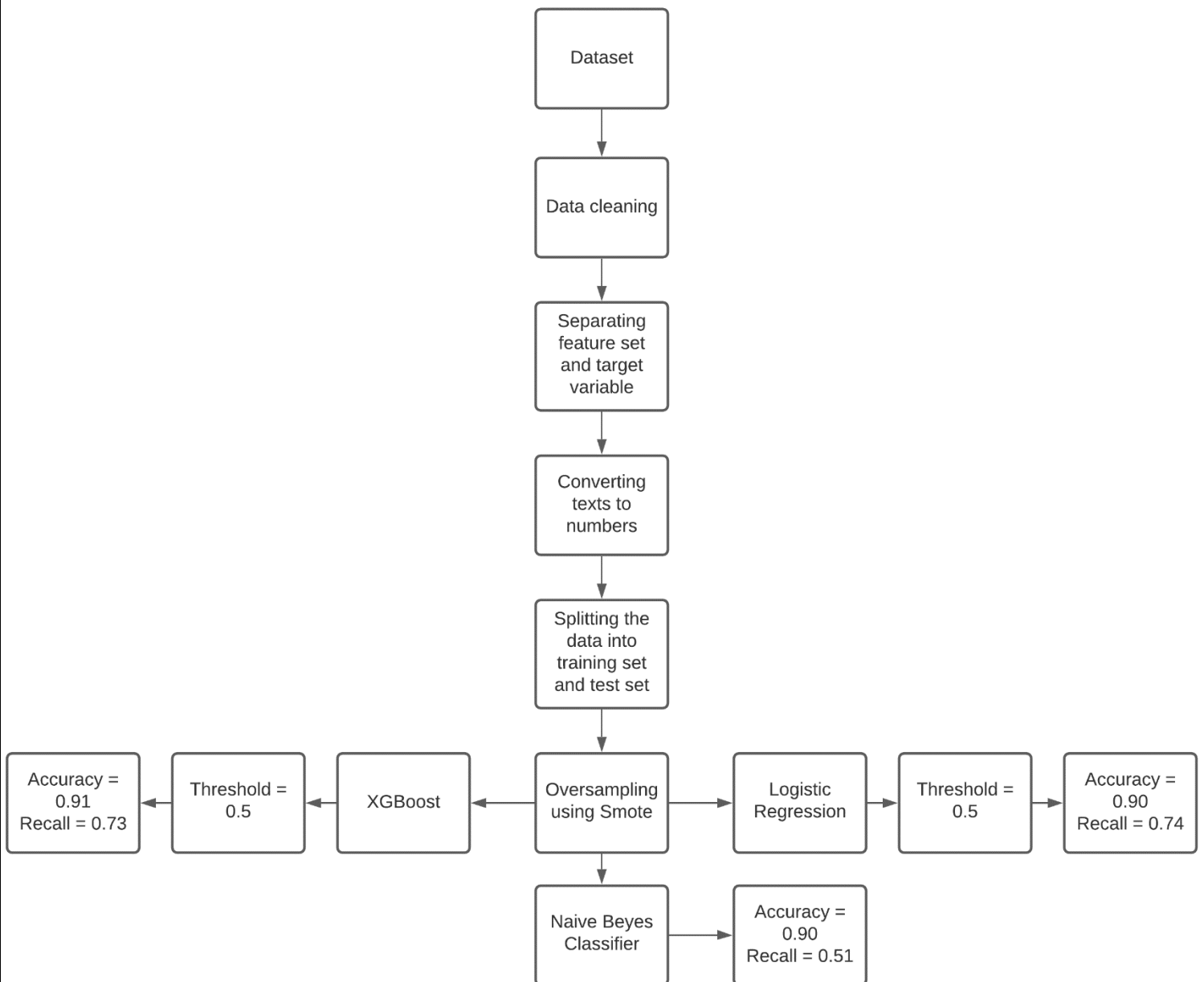


Figure 5: The logic used behind generating the report and the extra diligence part

References

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- [6] "US Banks Fact Sheet," 2021. [Online]. Available: <https://www.usbank.com/about-us-bank/fact-sheet.html>. [Accessed 2 12 2021].
- [7] "About Us: Wells Fargo," 2021. [Online]. Available: <https://www.wellsfargojobs.com/about-us>. [Accessed 3 12 2021].