

# Predicting UDAAP: Analyzing Consumer Complaints for Financial Fairness

## American Express

Group 13

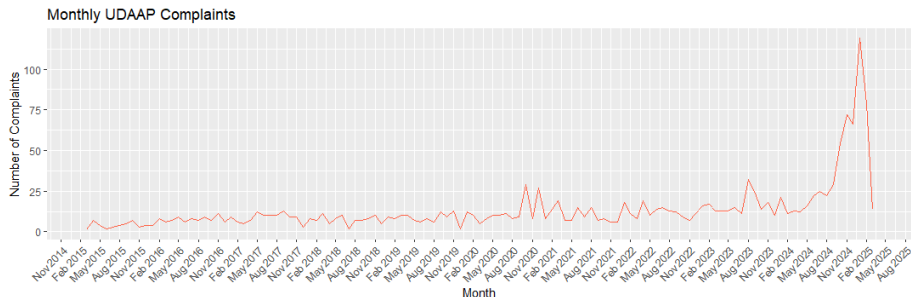
Arnab Das (231080020)  
Gaurav Tomar (231080039)  
Soumen Konai (231080091)  
Jayant Vikash Jha (220479)

# Introduction

- Using consumer complaint data maintained by the CFPB this project investigates the rise of UDAAP complaints in the US credit card sector. Through trend analysis, forecasting models, and sentiment correlation studies, we aim to predict future risks, quantify bank-wise complaint growth, and identify systemic issues. The results can provide valuable insights for enhancing consumer protection and regulatory responses.
- **Task-1**
- Filtered complaints mentioning "UDAAP" in Issue, Sub-issue, or Complaint-text using case-insensitive regex.
- Aggregated monthly UDAAP complaints and plotted their trend from November 2014 to early 2025, with rotated x-axis labels for clarity.
- Observed that complaint levels were stable until 2022, followed by a sharp surge in 2024, and a slight decline in early 2025 but remaining above historical averages.

## Output:

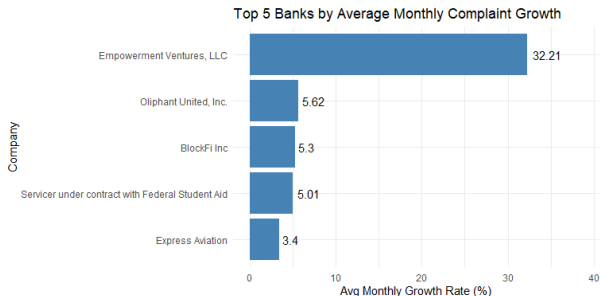
Following are the Monthly UDAAP Complaints:



- 2014 - 2022: UDAAP complaint levels remained stable and relatively low.
- Late 2022 - 2024: Sharp upward shift, with complaints peaking significantly throughout 2024.
- Early 2025: Slight decline observed, but complaint levels remain above historical averages, indicating sustained concern.

## Task 2

- **Top Banks by Complaint Growth:** We extracted monthly complaint volumes per bank and computed average month-over-month growth rates. Empowerment Ventures, LLC showed the steepest growth, topping the list of five banks with the highest complaint escalation.



- **Time Series Focus - Empowerment Ventures:** A time-series analysis (pre- and post-2016) revealed a spike in complaints in 2015 followed by a sharp decline. We also applied ETS modeling, selecting Simple Exponential Smoothing (ETS(A,N,N)) due to absence of trend/seasonality to forecast.

## Task 2

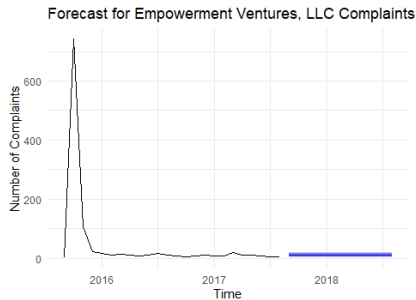
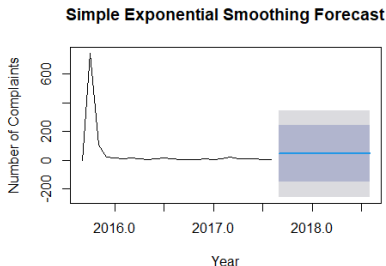


Figure: Forecasted Plots.

- **Key Insight:** Forecasts indicate stabilized, low complaint volumes post-2016. The initial surge likely reflected early-stage operational issues, with subsequent improvements possibly driven by regulatory or internal corrective measures.
- **Stable Forecast Trend:** The time series model predicts a consistent value of 9.6 for all future months (Sep 2017 Aug 2018), with wide confidence intervals (e.g., 1.6 to 17.6 at 95% confidence), indicating high uncertainty despite flat projections.

## Task 3

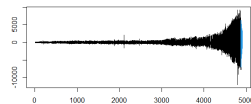
- The correlation matrix shows that the number of UDAAP complaints is strongly positively correlated with the unemployment rate (0.922) and moderately negatively correlated with CPI inflation rate (- 0.554), suggesting that economic stress, particularly higher unemployment, is associated with more complaints.
- Trend and Fluctuation: Both plots show that future UDAAP complaints fluctuate around zero, without a clear upward or downward trend.
- Uncertainty Increase: The spread of the forecasts becomes wider over time, meaning the prediction becomes less certain as time moves forward.

```

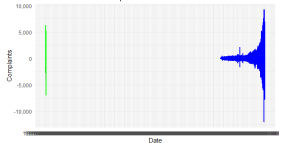
unemp_loymentrate cpiinflationrate no. of complaints
unemp_loymentrate    1.000         -0.807         0.922
cpiinflationrate     -0.807         1.000        -0.554
no. of complaints      0.922        -0.554         1.000

```

30-Day Forecast of Detrended Deseasonalized UDAAP Complaints

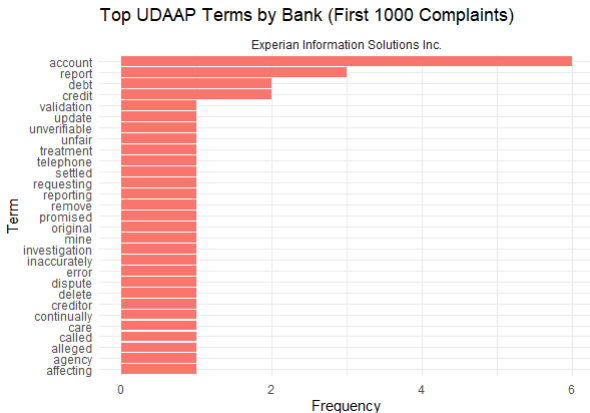


Forecasted UDAAP Complaints



## Task 4

- Filtered complaints using keywords like unfair, deceptive, and abusive. Cleaned the text by removing stop words, placeholders (like "xxxx"), and numbers. Extracted top 5 frequent words from the first 1000 complaints per bank to find key UDAAP themes.



- Created a faceted bar chart showing dominant complaint terms for each bank. Example: For Experian, words like **account** and **report** were most common, highlighting specific consumer concerns.

Text Analysis: Focused on complaints resolved after 10+ days to find recurring themes.

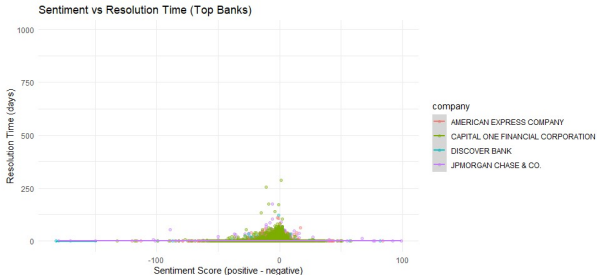
Figure: Comparison Plots.

- **Common Themes:** Issues around credit, accounts, cards dominated across all banks. Takeaway: Consistent delays in complex credit/card cases highlight need for faster, clearer processes.



## Task 6

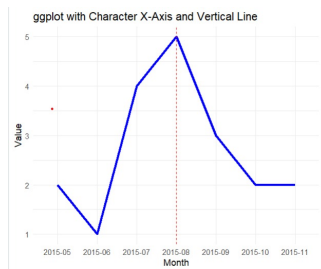
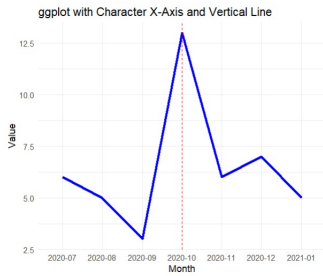
- Minimal Impact: Negative sentiment in complaints shows almost no correlation with resolution times (coefficients:  $-0.02$  to  $0.03$ ), indicating it has little influence on delays.



- Mixed Trends: Discover Bank had a slight positive link ( $+0.03$ ), while AmEx showed a weak negative trend ( $-0.02$ ) no consistent pattern across banks.

## Additional Tasks 1 & 2

- Regulatory Impact Observed: UDAAP complaints against Discover Bank showed a clear decline after CFPB enforcement actions (October 2020 and August 2015), suggesting that regulatory interventions effectively reduce unfair/deceptive practice complaints.



- Pre-Action Surge Possible: Both enforcement periods exhibited a slight rise in complaints leading up to the action date (visible in trend lines), hinting at potential increased consumer reporting before regulatory scrutiny.

# Thank You!