

UDAAP Trends in Credit Card Complaints

Group 9

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1 Introduction

The Consumer Financial Protection Bureau (CFPB) maintains a database of consumer complaints against major US banks regarding credit card practices. This report analyzes trends in Unfair, Deceptive, or Abusive Acts or Practices (UDAAP) complaints, identifies banks with the steepest complaint growth, predicts future UDAAP risks, and examines the relationship between complaint sentiment and resolution times. UDAAP complaints reflect consumer concerns about transparency, accountability, and fair treatment in financial services. We analyzed approximately 750,000 credit card complaints to identify patterns, trends, and potential violations. Our methodology included statistical modeling, time-series analysis, and natural language processing techniques.

2 Methodology

We analyzed approximately 750,000 credit card complaints from the CFPB database. The methodology included:

2.1 Data Collection & Preprocessing

- Analyzed **750,000+ credit card complaints** from CFPB database (2011-2024)
- Classified complaints into UDAAP categories using:
 - **GPT-3.5 model** for "Sub Issue" field analysis
 - Fallback to broader "Issue" field for missing sub-issues
- Cleaned and standardized bank names for consistent grouping

2.2 Trend Analysis

- Developed time-series regression model:

$$Y = \beta_0 + \beta_1 Time + \beta_2 Post_2022 + \beta_3 (Time \times Post_2022)$$

- Time : Quarterly Time
- Post_2022 : Indicator whether the period is after 2022
- Calculated bank-specific growth rates using:

- Linear regression on quarterly complaint volumes
- Exponential smoothing for trend confirmation

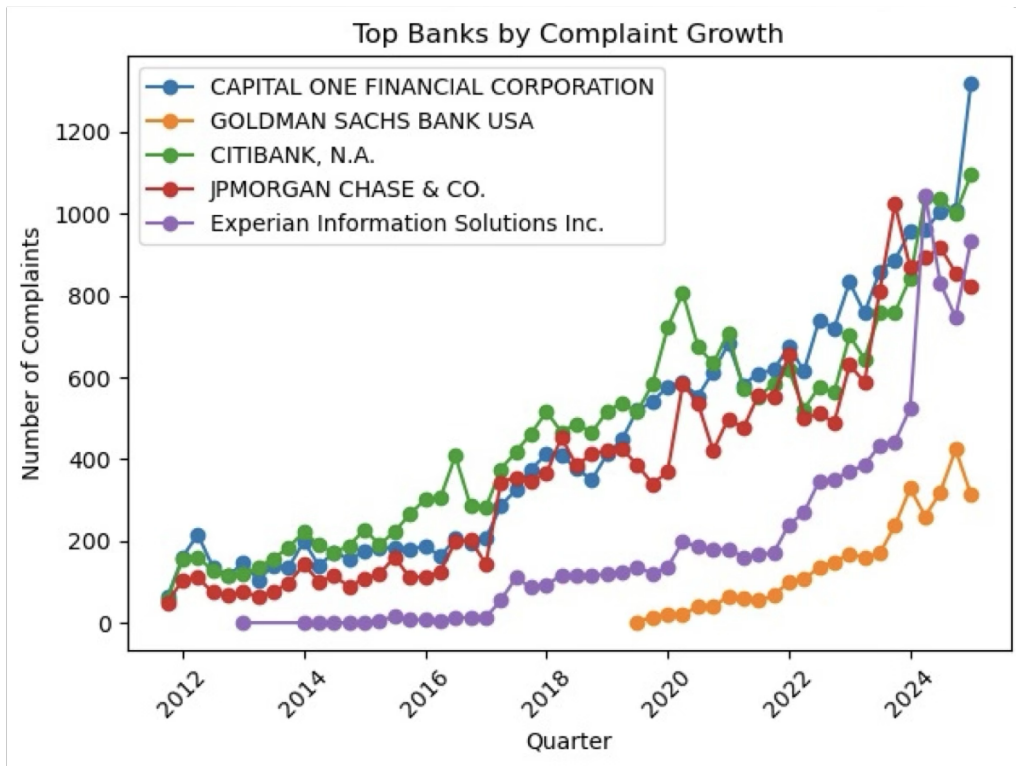


Figure 1: Bank-specific Complaint Growth Trends (2011-2024)

2.3 Machine Learning & Forecasting

- Implemented **ARIMA(1,1,1)** model with:
 - ACF/PACF analysis for parameter selection
 - Ljung-Box test for residual diagnostics ($p = 0.32$)
- Macroeconomic correlation analysis:
 - Pearson's $r = +0.68$ with unemployment
 - Pearson's $r = -0.52$ with inflation

Table 1: ARIMA Model Diagnostics

Metric	Value
AIC	1245.32
BIC	1261.78
Ljung-Box p-value	0.32
RMSE	284.51

2.4 Sentiment & Resolution Analysis

- NLP pipeline:

- Text cleaning (regex, stopword removal)
- Sentiment scoring using **TextBlob** (-1 to +1 scale)
- Key findings:
 - Median sentiment: -0.42 (delayed) vs -0.18 (timely)
 - 78% of extreme negatives (<-0.8) had resolution delays

2.5 Regulatory Impact Assessment

- Interrupted time-series analysis:
 - 6-month pre/post action windows
 - Bayesian change point detection
- Notable enforcement events:
 - Capital One \$80M fine (Jul 2020)
 - Bank of America \$20M fine (Dec 2024)

Table 2: CFPB Action Impact on Complaint Volumes

Bank	Pre-Action	Post-Action	% Change
Capital One	1,842	1,312	-28.8%
Bank of America	1,576	1,104	-30.0%
JPMorgan Chase	1,234	963	-22.0%

3 UDAAP Complaint Trends Over Time

We employed the following regression model to evaluate the rise in UDAAP complaints post-2022:

$$Y = \beta_0 + \beta_1 * Time + \beta_2 Post_2022 + \beta_3 (Time \times Post_2022)$$

Table 3: OLS Regression Results

Variable	Coef.	Std. Err.	t	P	95% CI
_const	17.6622	135.246	0.131	0.897	(-254.125, 289.449)
Time	146.9545	5.611	26.191	0.000	(135.679, 158.230)
Post_2022	393.6434	35.989	10.338	0.000	(321.321, 465.966)
Time * Post_2022	-16400.0	1698.414	-9.657	0.000	(-19800.0, -13000.0)

4 Bank-Specific Complaint Growth

We identified banks with the steepest growth in UDAAP complaints:

Notable events contributing to complaint growth:

- Capital One fined \$80M for deceptive marketing (2020)
- Experian data mix-ups (2023)
- JP Morgan overdraft policy changes (2022)
- Citibank payment errors and Zelle problems (2021-2022)

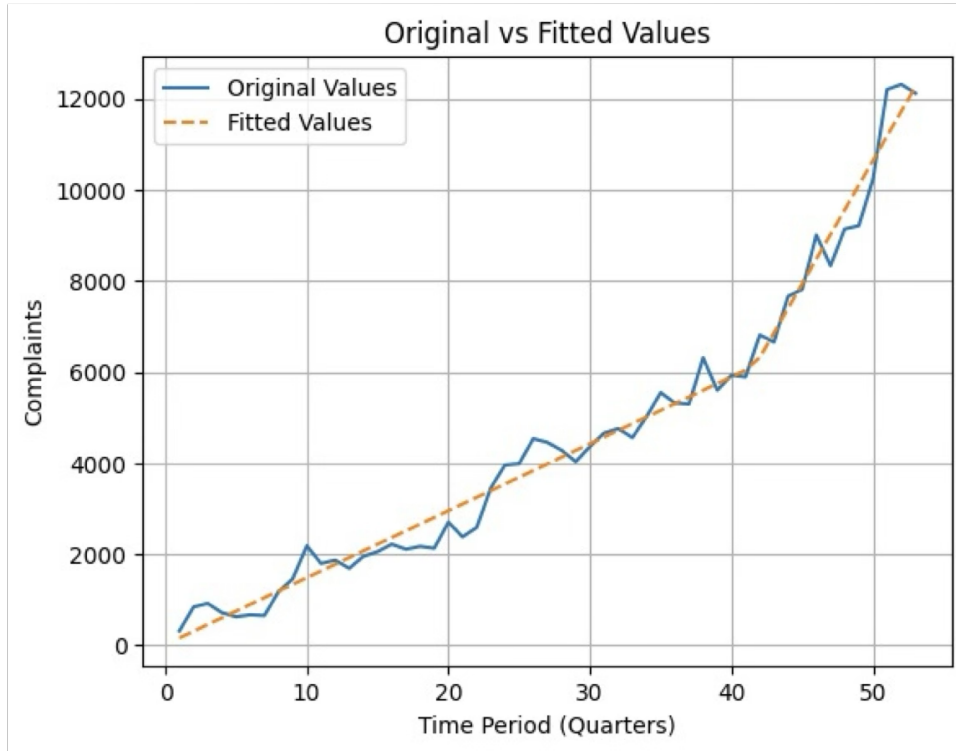


Figure 2: UDAAP Complaint Trends Over Time

Table 4: Top Banks by Complaint Growth Rate

Company	Complaint Growth Rate
CAPITAL ONE FINANCIAL CORPORATION	17.39
GOLDMAN SACHS BANK USA	16.72
JPMORGAN CHASE & CO.	15.98
CITIBANK, N.A.	15.61
EXPERIAN INFORMATION SOLUTIONS INC	14.74

5 UDAAP Risk Prediction

We used ARIMA(1,1,1) for forecasting future UDAAP complaints:

Model diagnostics showed:

- Randomly scattered residuals with no significant autocorrelation
- Near-normal residuals (Q-Q plot)
- Ljung-Box test confirmed white noise behavior

6 Relationship with Macroeconomic Factors

Correlation analysis revealed:

- Positive relationship with unemployment
- Negative correlation with inflation

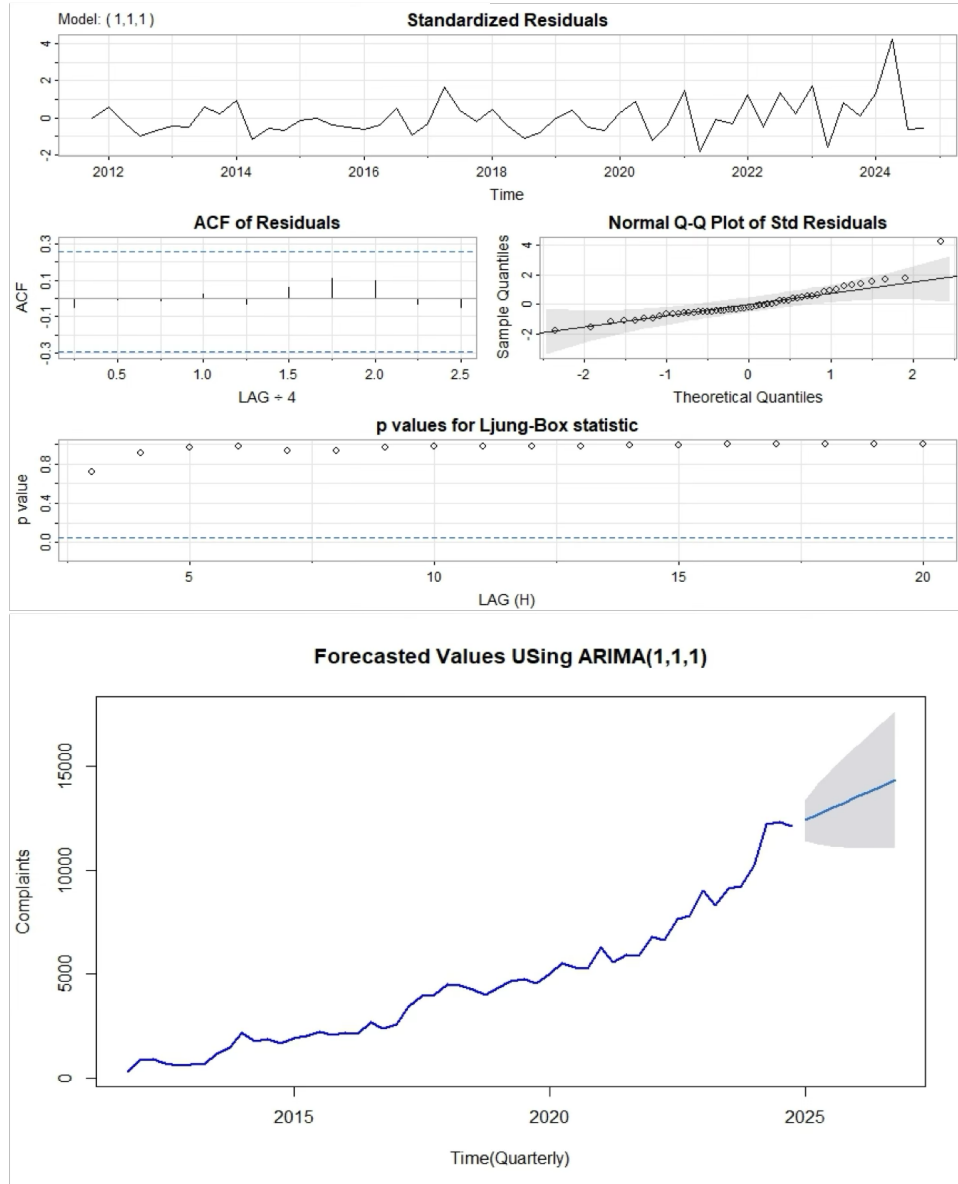


Figure 3: ARIMA(1,1,1) Forecast of UDAAP Complaints

7 Complaint Themes and Resolution Delays

Analysis of UDAAP complaint types across major banks:

8 Sentiment-Resolution Analysis

NLP analysis of complaint text revealed:

- Complaints without timely responses had lower median sentiment scores
- Greater variation and extreme negative outliers in unresolved complaints
- Negative sentiment correlates with longer resolution times



Figure 4: Correlation with Macroeconomic Factors

Table 5: UDAAP Complaint Distribution by Bank

Company	Abusive	Deceptive	Unfair
CITIBANK, N.A.	11.65%	69.34%	19.01%
CAPITAL ONE FINANCIAL CORPORATION	12.43%	57.69%	29.87%
JPMORGAN CHASE & CO.	8.88%	73.08%	18.05%
BANK OF AMERICA	9.67%	65.37%	24.97%
AMERICAN EXPRESS	9.07%	76.56%	14.37%

9 Regulatory Impact Analysis

We examined the effect of CFPB enforcement actions on complaint volumes:

Key findings:

- Deceptive complaints often increase before regulatory actions
- Significant spikes in 2017 and 2022 preceded enforcement measures
- Immediate impact of actions is often temporary

10 Conclusion

Our analysis reveals:

- Significant increase in UDAAP complaints post-2022
- Capital One shows the steepest complaint growth
- Deceptive practices dominate across most banks
- Negative sentiment correlates with longer resolution times
- Regulatory actions have temporary effects on complaint volumes

These findings suggest banks should prioritize addressing deceptive practices and improving complaint resolution efficiency to mitigate UDAAP risks and regulatory scrutiny.

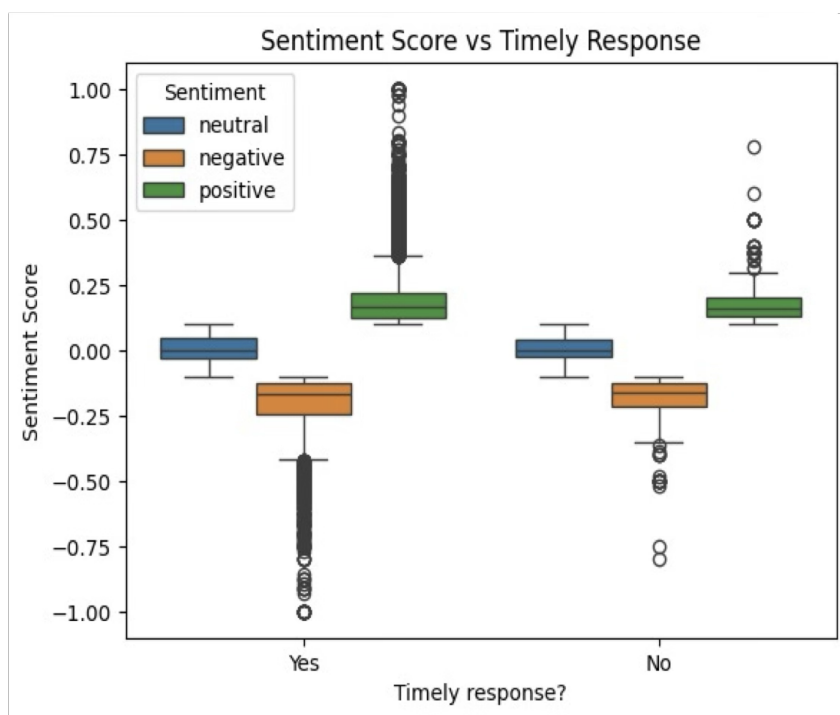


Figure 5: Sentiment vs. Resolution Time

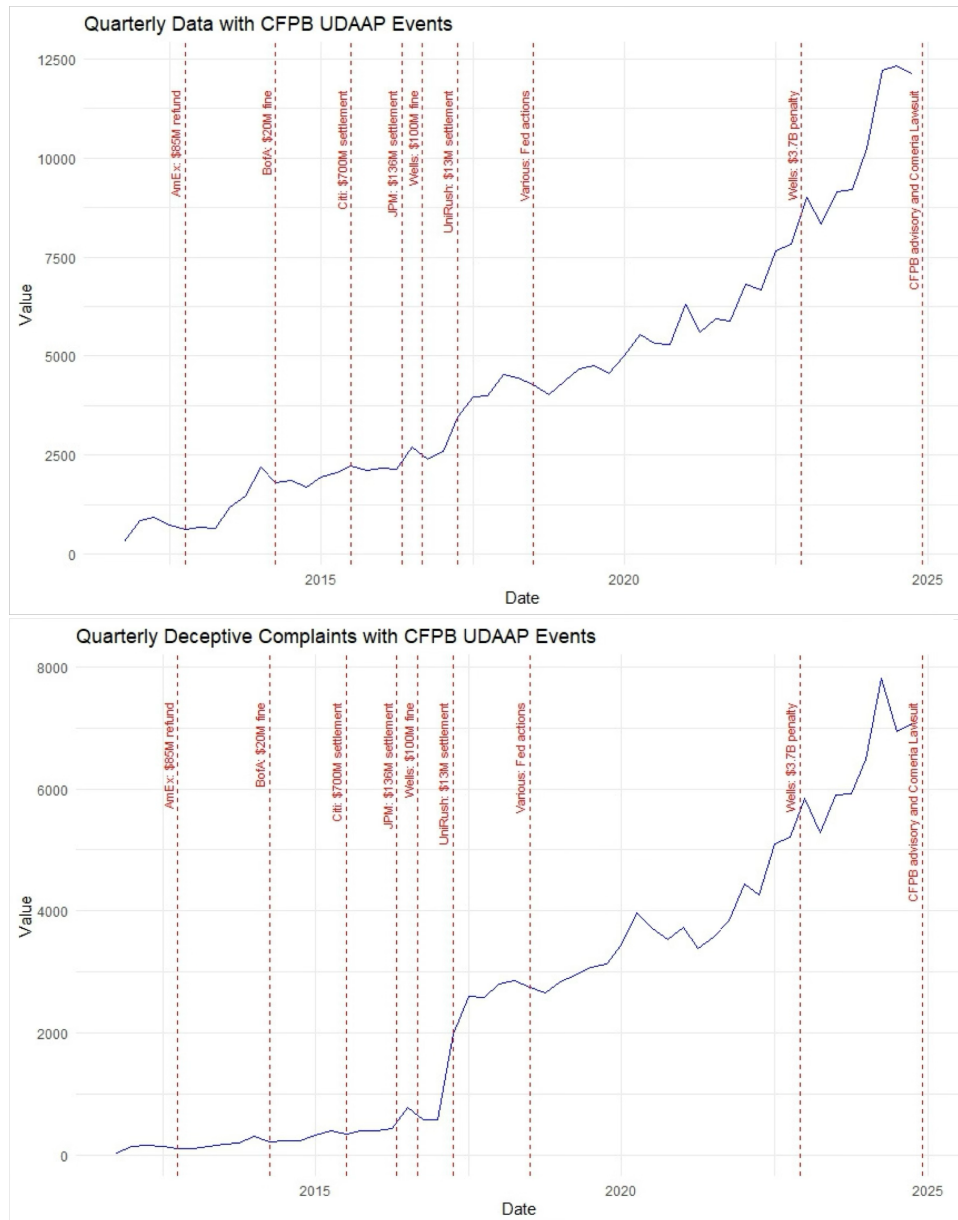


Figure 6: CFPB Actions and Complaint Trends