SENTIMENT AND TOPIC MODELLING

US CONSUMER FINANCIAL PROTECTION BUREAU

DOCUMENTATION

This web application displays the sentiment and topic analysis of complaints received by the **US Consumer Financial Protection Bureau**.

The panel on the left lets you filter the details on whether the customer was *compensated* before or after the complaint was lodged and the type of *product* the complaint was about.
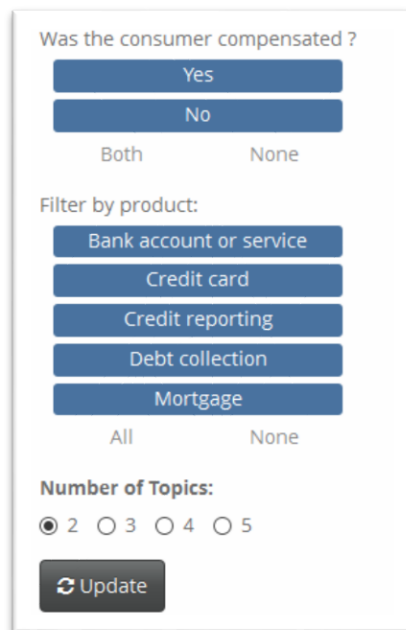
NOTE: The filters apply to all the tabs.

The tabs area display the various views pertaining to the complaints.

CONTENTS

Filters

The filter panel consists of an area to filter on the data set details and the section to update the topic analysis panels.

The filter on whether a consumer was compensated and by specific product will change as soon as the selected label has changed its value.

The "Both/All" buttons will select all the values for that filter and the "None" label will deselect all the values.

If the compensation filter is empty (all labels are unselected) then the complaints will only be filtered by products.

If all the products are unselected, then the complaints will only be filtered by the compensation status of the complaint.

To change the number of topics the complaints will be divided into, first select the value (2-5) then click on the "Update" button.

Note that the number of topics filter will only show on tabs that the filter influences, meaning it will not be visible on the "Sentiment Analysis" tab because the filter is not used.

Help

The help overlay gives a quick overview of the page, the filters and tabs.

The overlay is accessed by clicking on the help icon.

Help

This web application displays the sentiment and topic analysis of complaints received by the **US Consumer Financial Protection Bureau**.

The panel on the left lets you filter the details on whether the customer was *compensated* before/after the complaint was lodged and the type of *product* the complaint was about.

NOTE: The filter apply to all the tabs.

The tabs display the various views pertaining to the complaints.

1. **Sentiment Analysis**
   - Histogram of the sentiment for all complaints for that period of time.
   - Sentiment score for each of the products and/or if they were compensated.
2. **Topic Modeling**
   This plot displays the *top 15* words filtered on the selected number of topics.
3. **New Complaint**
   Select or enter a new complaint to be used for analysis.

SENTIMENT ANALYSIS

Sentiment and Topic Modelling : US Consumer Financial Protection Bureau

Sentiment Analysis 📊   Topic Modeling 📊   New Complaint 🖥

Was the consumer compensated ?

| Yes |
| No |

Both   None

Filter by product:

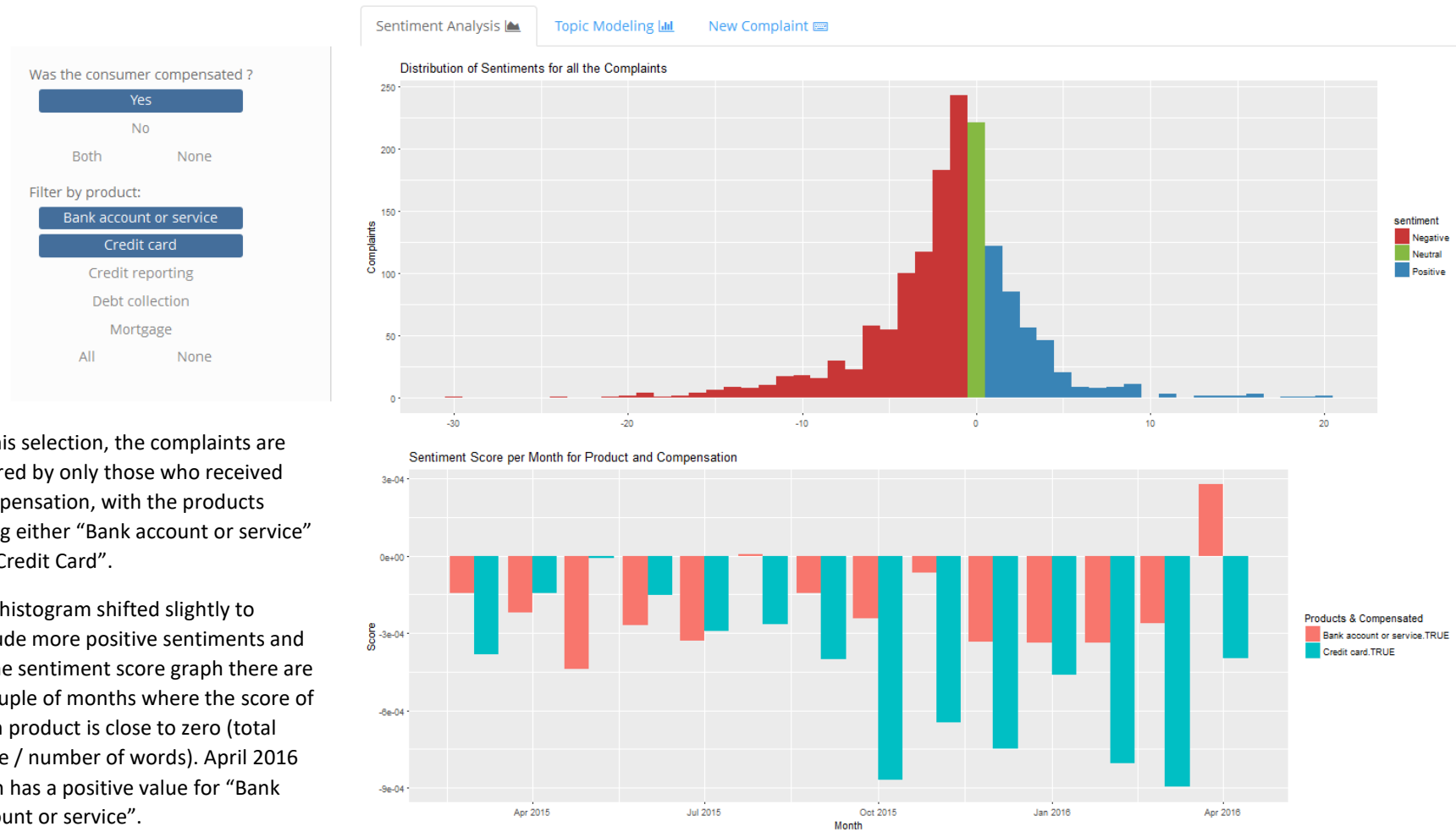| Bank account or service |
| Credit card |
| Credit reporting |
| Debt collection |
| Mortgage |

All   None

This selection of filters display the complete dataset with both values for compensation and all the products.

The histogram show at the top displays the number of complaints based on their sentiment.

The bottom plot displays the sentiment score for the product with the compensation value; and grouped by month. The score is calculated on the overall difference of sentiment and the number of words in the complaint.

Distribution of Sentiments for all the Complaints

sentiment
- Negative
- Neutral
- Positive

Sentiment Score per Month for Product and Compensation

Products & Compensated
- Bank account or service.FALSE
- Credit card.FALSE
- Credit reporting.FALSE
- Debt collection.FALSE
- Mortgage.FALSE
- Bank account or service.TRUE
- Credit card.TRUE
- Credit reporting.TRUE
- Debt collection.TRUE
- Mortgage.TRUE

Sentiment and Topic Modelling : US Consumer Financial Protection Bureau

Sentiment Analysis 📊   Topic Modeling 📊   New Complaint ⌨

Was the consumer compensated ?

Yes
No
Both   None

Filter by product:

Bank account or service
Credit card
Credit reporting
Debt collection
Mortgage
All   None

In this selection, the complaints are filtered by only those who received compensation, with the products being either "Bank account or service" or "Credit Card".

The histogram shifted slightly to include more positive sentiments and in the sentiment score graph there are a couple of months where the score of both product is close to zero (total score / number of words). April 2016 even has a positive value for "Bank account or service".

Distribution of Sentiments for all the Complaints

sentiment
- Negative
- Neutral
- Positive

Sentiment Score per Month for Product and Compensation

Products & Compensated
- Bank account or service.TRUE
- Credit card.TRUE

4
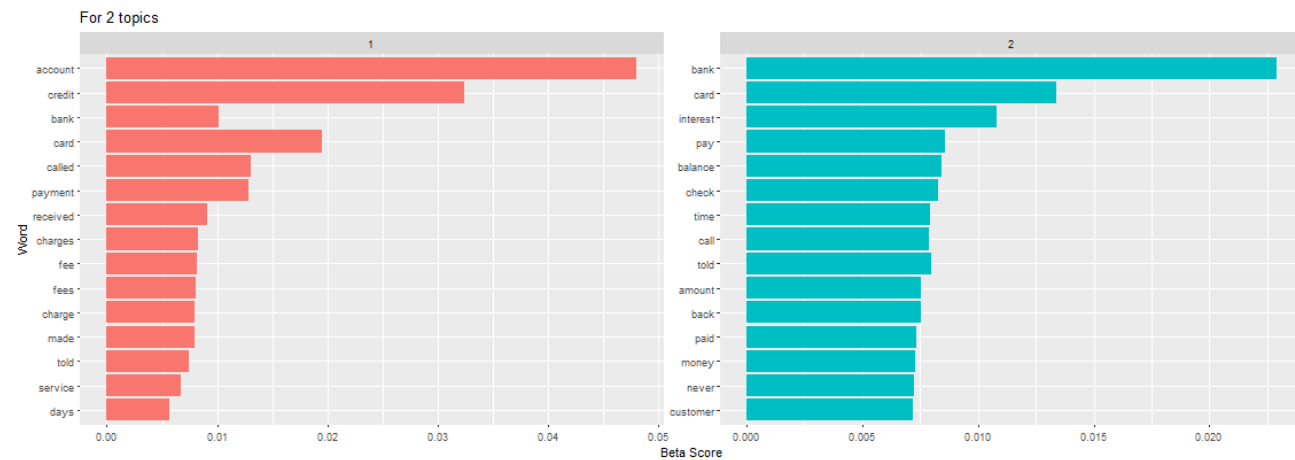
TOPIC MODELING

The topic modeling uses the filters as described above and adds a selector for the number of topics to use to evaluate the complaints. In this case the same filters are used as shown on the previous page and it is filtered by 2 topics.

Sentiment and Topic Modelling : US Consumer Financial Protection Bureau

Sentiment Analysis 📈   Topic Modeling 📊   New Complaint ⌨

Was the consumer compensated ?

| Yes |
| No |

Both   None

Filter by product:

| Bank account or service |
| Credit card |
| Credit reporting |
| Debt collection |
| Mortgage |

All   None

Number of Topics:

○ 2 ○ 3 ○ 4 ● 5

🔄 Update

For 5 topics

All the values and products are selected and the analysis was done on 5 topics.

Sentiment and Topic Modelling : US Consumer Financial Protection Bureau

Sentiment Analysis | Topic Modeling | New Complaint
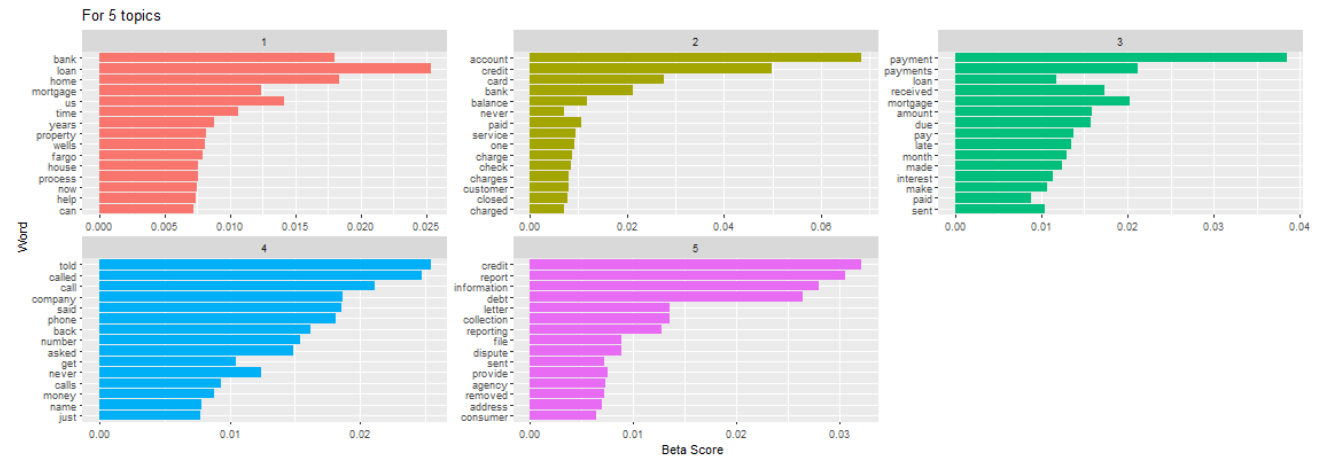
Was the consumer compensated ?
- Yes
- No
- Both   None

Filter by product:
- Bank account or service
- Credit card
- Credit reporting
- Debt collection
- Mortgage
- All   None

Number of Topics:
● 2 ○ 3 ○ 4 ○ 5

Update

Sampling Method
● Random ○ Select Existing ○ New

⤭ Select a random existing complaint

Results: Sentiment: -2 : Percentile: 65

Topic	Proportion
1	0.54
2	0.46

ID:
8531

Complaint:
Advised me that as long as I set up payment plan with them they would not report to credit bureau. As soon as I started payment they reported it to my credit. Then I called and they said when I finished payment they would remove it. Then they said they never said any of that. Then they refused to provide me with the transcripts or recordings after I repeatedly asked. Then said again they would remove from my credit report and did not. Refused to provide me with my communication with them. They also called me after I paid saying I still owe them.

Sentiment and Topic Modelling : US Consumer Financial Protection Bureau

Sentiment Analysis | Topic Modeling | New Complaint

Was the consumer compensated ?
- Yes
- No
- Both   None

Filter by product:
- Bank account or service
- Credit card
- Credit reporting
- Debt collection
- Mortgage
- All   None

Number of Topics:
● 2 ○ 3 ○ 4 ○ 5

Update

Sampling Method
○ Random ● Select Existing ○ New

Complaint ID (1 - 20 000)
15

⮑ Use complaint

Results: Sentiment: -2 : Percentile: 65

Topic	Proportion
1	0.50
2	0.50

ID:
15

Complaint:
I agreed to a X procedure. I dispute the balance from the procedure because I did not get what I requested. The physician in question offered to repeat the procedure to give me the desired outcome. Why would I agree to pay X for something that it is obvious the physician could not perform? It may be a good business model for the physician but in my opinion. it 's deceptive advertising. I offered to settle the disputed amount for less. Their response was to report a higher amount as a collection item to X.

The "New Complaint" tab allows the user to either select an existing complaint (randomly or by entering the complaint ID) or to enter new text that is then examined using the filters selected and the number of topics.

The result of the selection will display the overall sentiment, the percentile it belongs, the complaint id (20001 if it is new), the complaint text and the topic proportional scores.

The "Random" selector randomly selects an id from the 20 000 complaints and displays the results.

The "Select Existing" allows the user to enter an existing ID to use in the analysis.

The "New" selector allows the user to enter new complaint to use.

Sentiment and Topic Modelling : US Consumer Financial Protection Bureau

Sentiment Analysis ▲   Topic Modeling 📊   New Complaint ⌨

Was the consumer compensated ?

| Yes |
| No |
| Both | None |

Filter by product:

Bank account or service
| Credit card |
| Credit reporting |
Debt collection
Mortgage
All   None

Number of Topics:

○ 2 ○ 3 ○ 4 ● 5

⟳ Update

Sampling Method

○ Random   ○ Select Existing   ● New

Complaint:

The next representative barely spoke English and disconnected my call as well. I called back a 3rd time and XXXX was my XXXX rep this time. She advised me XXXX did n't have access to my notes since the account was in collections. She advised I write to the corporate office. I spoke with XXXX XXXX at the collection agency. I was advised he was a manager. He offered to Settle the account. I advised him I am disputing this bill as false. I made him aware of my intentions to file a complaint. I have sent this complaint in writing to IC Systems as well as to the corporate office of XXXX in XXXX XXXX, CO. I am desperate to have this corrected. I do not want this falsely reporting on my credit bureau report. This debt is an error. If someone would take the time to read the notes on my file they would see the error by XXXX.

➤ Submit

Results: Sentiment: -11 : Percentile: 65

Topic	Proportion
1	0.24
2	0.22
3	0.20
4	0.16
5	0.18

ID:

20001

Complaint:

I was an account holder with XXXX. My account # was XXXX. XXXX was notified that my Landlord revoked permission to have the dish on my roof. The rep was to cancel my account. I was advised I would NOT be charged a cancellation fee because it was my landlord who was revoking the permissions. A box was sent to me and the receiver was promptly returned. XXXX has acknowledged receipt XXXX XXXX, 2017. A few weeks later I received a bill for early termination and service use. I immediately contacted XXXX and the rep I spoke with acknowledged my service should have been disconnected. She acknowledged I was being billed incorrectly for the termination fee. She also acknowledged I was being billed for two months of service after I returned the receiver. She advised me the issue would be resolved and I would receive no further bills. NOW I am getting a collection letter from IC Systems. They are advising my account is in collections. I advised I was disputing the debt. The collector stated I needed to contact XXXX directly. I spoke with XXXX from XXXX on Friday, XXXX XXXX, 2017. She was rude and disrespectful. She intentionally hung up on me and placed me back in the queue. The next representative barely spoke English and disconnected my call as well. I called back a 3rd time and XXXX was my XXXX rep this time. She advised me XXXX did n't have access to my notes since the account was in collections. She advised I write to the corporate office. I spoke with XXXX XXXX at the collection agency. I was advised he was a manager. He

This screen shows the selection of complaints that where compensated and "Credit card" and "Credit reporting" selected with 5 topics to analyze. The new complaint text that was entered results in a close comparison between topics with topic 1 being the best match. The sentiment score is low at -11 but it falls within a reasonable range as it is similar to other complaints in the group (percentile).