ANTICIPATING THE FORD DOWNGRADE: EXAMPLE APPLICATION FOR CONTEXTUAL SENTIMENT ANALYSIS OF PUBLISHED ARTICLES

September 16, 2019

EXECUTIVE SUMMARY

Moody's recent downgrade of Ford (Ticker: F) on Monday September 9th presents an opportunity to explore whether the aggregated information contained in published financial and economics-related articles could have warned us of the strong potential for downgrade prior to Moody's announcement.

To answer this question, we did an analysis of aggregated contextual sentiment on a corpus of 72 million financial and economic-related documents published over the past 5 years. These documents include daily news articles, company analyses, earnings call transcripts, government filings and other related documents.

The results indicate that the early warning signs of the Moody's downgrade could indeed be gleaned through an intelligently guided traversal through a large corpus of published financial documents and articles as explained in this paper.

DOCUMENT SENTIMENT ANALYSIS APPROACH

Several studies have been conducted with the aim of mining sentiment from financial texts, however, our approach is unique in the granularity with which we can drill into and delineate that sentiment in a more precise way. In other words, we don't just look at whether the overall sentiment of an article or an author on a company is positive or negative (which I use to mean bullish or bearish) – we wanted the basis for the sentiment to include context like:

> ➢ What is the percentage positive vs negative sentiment on Ford overall?
> ➢ What is the sentiment specifically on the stock price right now? And how about the sentiment on the future predicted stock price, if discussed?
> ➢ What is the sentiment on sales in N. America vs on sales in China when reviewing the past quarter? How about looking ahead a quarter?
> ➢ What is the sentiment on the automotive industry overall?
> ➢ Which events over the past year have changed the sentiment? And has that change driven the sentiment more bearish or bullish?

What is the sentiment on sales in N. America vs China when reviewing the past quarter? How about looking ahead a quarter?

To achieve contextual sentiment analysis, we leveraged the advanced Natural Language Processing (NLP) methods within our Causality Link Research Assistant to map the content of the articles to over 1500 different financial/economic indicators alongside 3 other types of contextual metadata:

- Mentions of Indicators (KPIs) Linked to Ford – Direct indicators could include company mentions of Ford, it's products, financials or locations where it operates and sells. Indirect indicators could be statements about the automotive industry as a whole, steel prices, or tariffs on imports into a region in which Ford sells – as well as any expressed sentiments about these indicators
- Mentions of Events Linked to Ford – Such as earnings announcements, restructuring, analyst downgrade, product launch, etc.
- Sentiment Trends – In which the sentiment about the above-mentioned Indicators changes in time, and whether that sentiment is about the past or a future forecasted trend
- Causal Links – Stated causal connections or explanations, articulated as Events linked to Indicators or Indicators linked to other Indicators.

KNOWING WHERE TO LOOK

Analysts are inundated with articles and reports about the companies, industries, commodities or regions they are tracking. Imagine for a moment if an analyst were able to start his/her day with a news summary & analytics portal like this one:
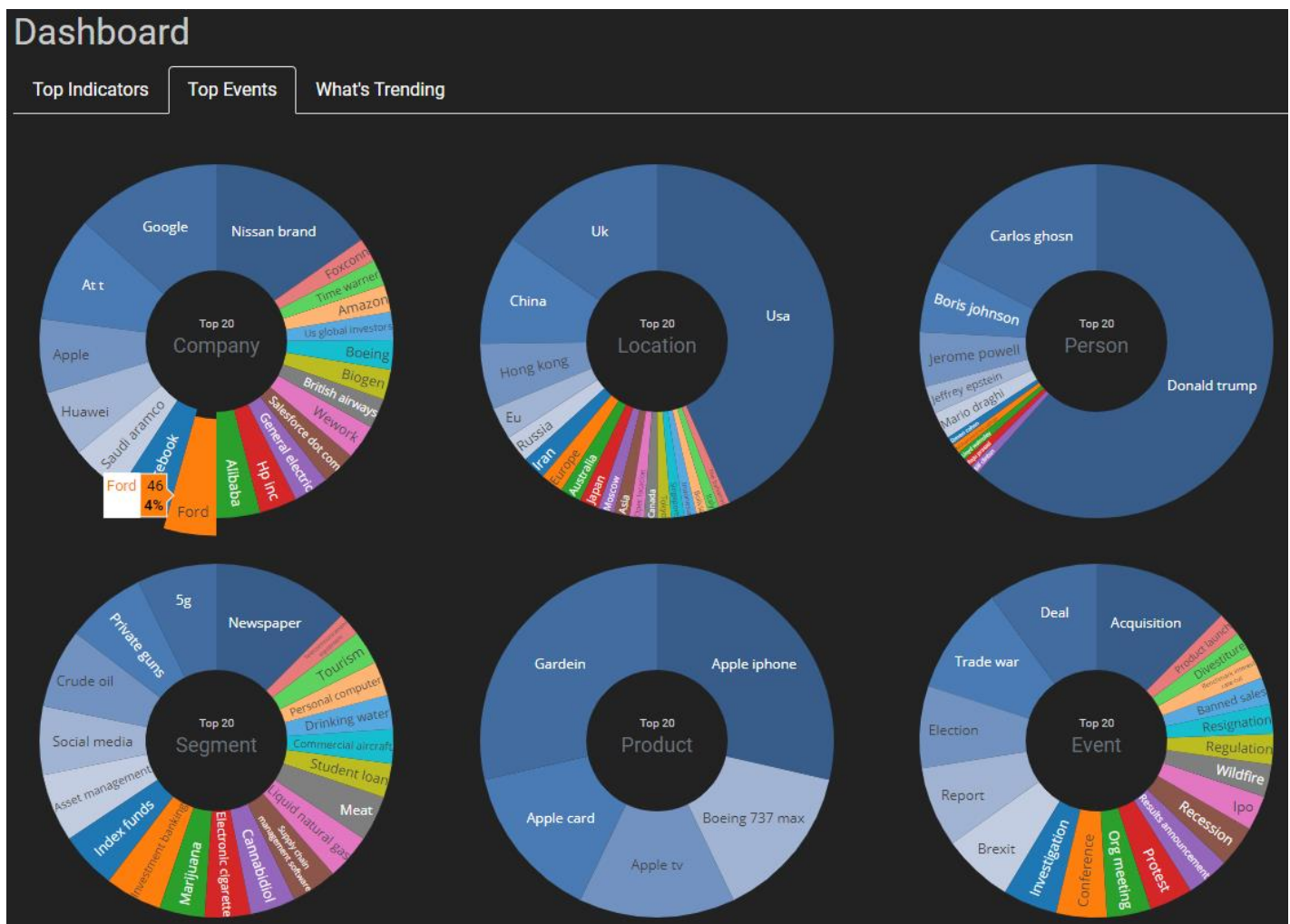
Drilling into Ford, the analyst could see all of the aggregated sentiment on the various indicators directly or indirectly related to Ford, that have been discussed in articles before and up to the date of the analysis (in this case, say, a day in mid February).

Analysts concerned with risk mitigation might focus on the areas of negative/bearish sentiment. In this case, the most broadly negative sentiments were around two KPIs: Ford's Assets (cash) and Credit Rating. A strongly negative outlook on Ford's credit rating is worrisome. So the analyst might drill into that item in the second to last row, which is based on 3 source documents, each with a down sentiment (negative/bearish):

| Company ▼ | Location ▼ | Industry ▼ | KPI ▼ | ✕ |

20%
Up   -
Down 3

Recent Trends about Ford Credit rating
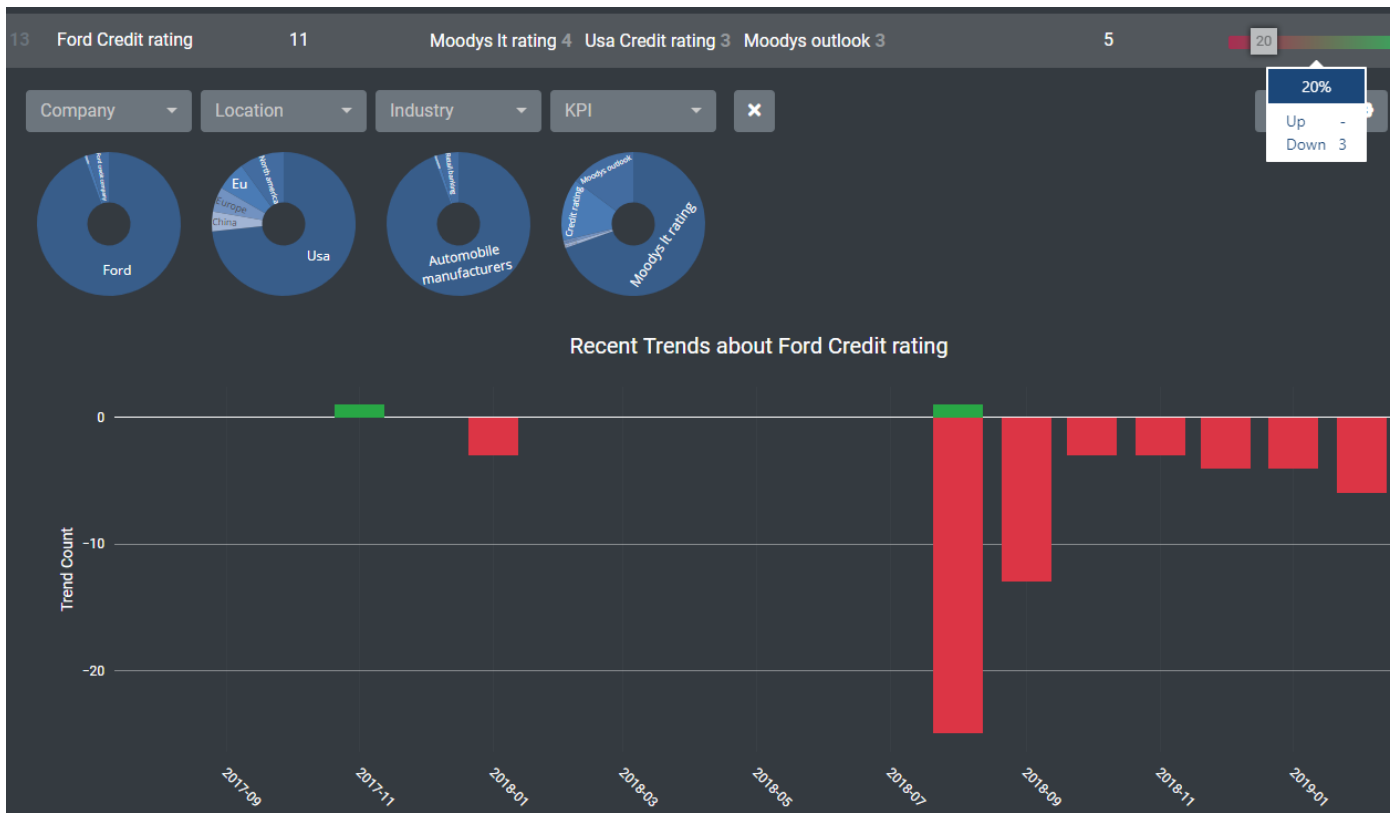
Clicking on the various bars allows the analyst to navigate to the source documents, presenting these article titles and snippets shown on the here:

#	Detailed Indicator	Mentions
1	Ford Automobile manufacturers Moodys It rating	6

Ford's Dividend Depends On This
On August 29, Moody's downgraded Ford to one notch above Junk, set outlook at negative, and noted the following:
-- Published on **2019-02-13**

Ford's Earnings And Reported January Sales Have Me Staying The Path
Moody's downgraded Ford to just above junk status citing its believed negative outlook for the automaker.
-- Published on **2019-02-11**

Ford's Earnings And Reported January Sales Have Me Staying The Path
Ford's stock has seen pressure ever since the stock was downgraded by Moody's last quarter as the company's dividend has been under the microscope.
-- Published on **2019-02-11**
Forecast end **2019-01-01**

To learn more, the analyst could read the articles, either within the Causality Link interface so that the key phrases are highlighted[1], or by clicking over to the document itself, available to our reader by clicking here: Ford's Dividend Depends on This.
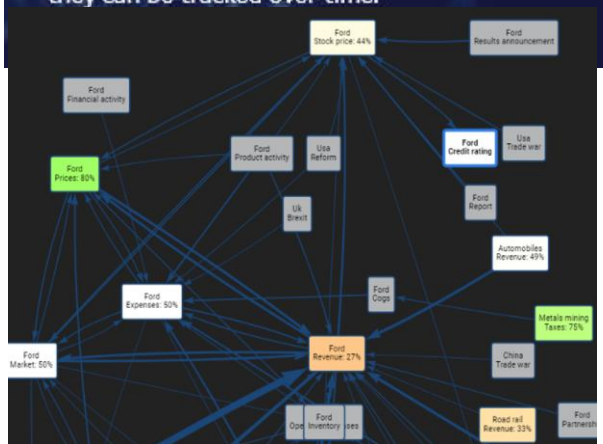
Of particular note in the article is the section titled **Imminent Credit Rating Downgrade**. Here, the author clearly warns us that a credit rating downgrade is imminent if improvements aren't shown in Ford's:

- N. America EBIT margin[2] & market share
- Chinese market share & profitability
- Positive free cash flow

MONITORING THE IMPORTANT INDICATORS

Assuming that the analyst wants to keep track of the credit downgrade risk, then it makes sense to monitor sentiment on each of the KPIs associated with the 3 important downgrade-risk factors mentioned in the article referencing the Moody's report.

On July 25, the day after the Q2 earnings announcement when these KPIs were discussed more widely, the analyst would certainly see an uptick in volume of mentions, but so that we can see the full YTD trend, let's fast forward to September 6, which ends the last week before Moody's made their announcement. Beginning with the overall Ford dashboard, here's what the analyst would see on September 6:

CAUSAL GRAPH ANALYSIS

It can be challenging to connect the dots between long causal chains, which may not be spelled out in a single document or even understood by a single person. Eg Moody's downgrade could be caused by lower profitability and market share in China, which is exacerbated by something reported on by someone else and on a different date, such as Trump's trade war and the resulting increase in tariffs on goods sold to China. This is a simple example, but consider if the chain is 3 or 4 links long and the causal statements are made at different points in time and by very disconnected authors (an economist, a white house correspondent and a portfolio manager). This is one of the reasons that tracking something like credit downgrade risk is tricky, since it's driven by multiple causal factors. Luckily, these causal linkages are maintained as metadata in Causality Link, so they can be tracked over time.

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[1] Content licensing restrictions prevent us from showing the marked-up document here, but contact us at info@causalitylink.com for a full demo.

Indicators of: Ford

#	Indicators by Mentions	Recent Mentions	Recently Discussed	Causal Links	Forecast	
1	Ford Revenue	67	China Sales 25 China Diversified financial services Sales 9 China Automobiles Sales 6	166	27	
2	Ford Production	65	Brazil Plants 11 China Diversified financial services Plants 6 China Production capacity 4	61	54	
3	Ford Stock price	45	Stock price 42 200 day moving average 3	110	44	
4	Ford Employment	36	Brazil Automobile manufacturers Employees 7 Brazil Automobile manufacturers Employment 6 Brazil Auto components Employment 6	31	14	
5	Ford Profit	34	Diversified financial services Profit 6 Net income 3 Automobiles Profit 3	286	78	

Sorting by volume of mentions, Revenue seems to be the most talked-about KPI, with 67 recent mentions, especially around China Sales (25 mentions).

Can one actually glean useful insights into financial indicators mid-quarter, in between earnings announcements? ... Our analysis suggests that the answer is yes.

OVERWEIGHTING EARNINGS ANNOUNCEMENT REPORTS

There are some drawbacks to overly weighting the news that follows earnings statements :

1. Everyone is following these reports closely, so market movements will have taken these sentiments into account very quickly.

2. Statements coming from company leadership can be biased.

3. Credit rating adjustments don't always immediately follow earnings announcements. Analysts want to be able to anticipate events and market movements by tracking indicators mid-quarter, prior to earnings releases. Can one actually glean useful insights into financial indicators mid-quarter, in between earnings announcements? Or put another way, are the authors who write about Ford every day able to provide valuable clues? Our analysis suggests that the answer is yes.

Now drilling into all of the revenue-related sub-indicators and their trends:
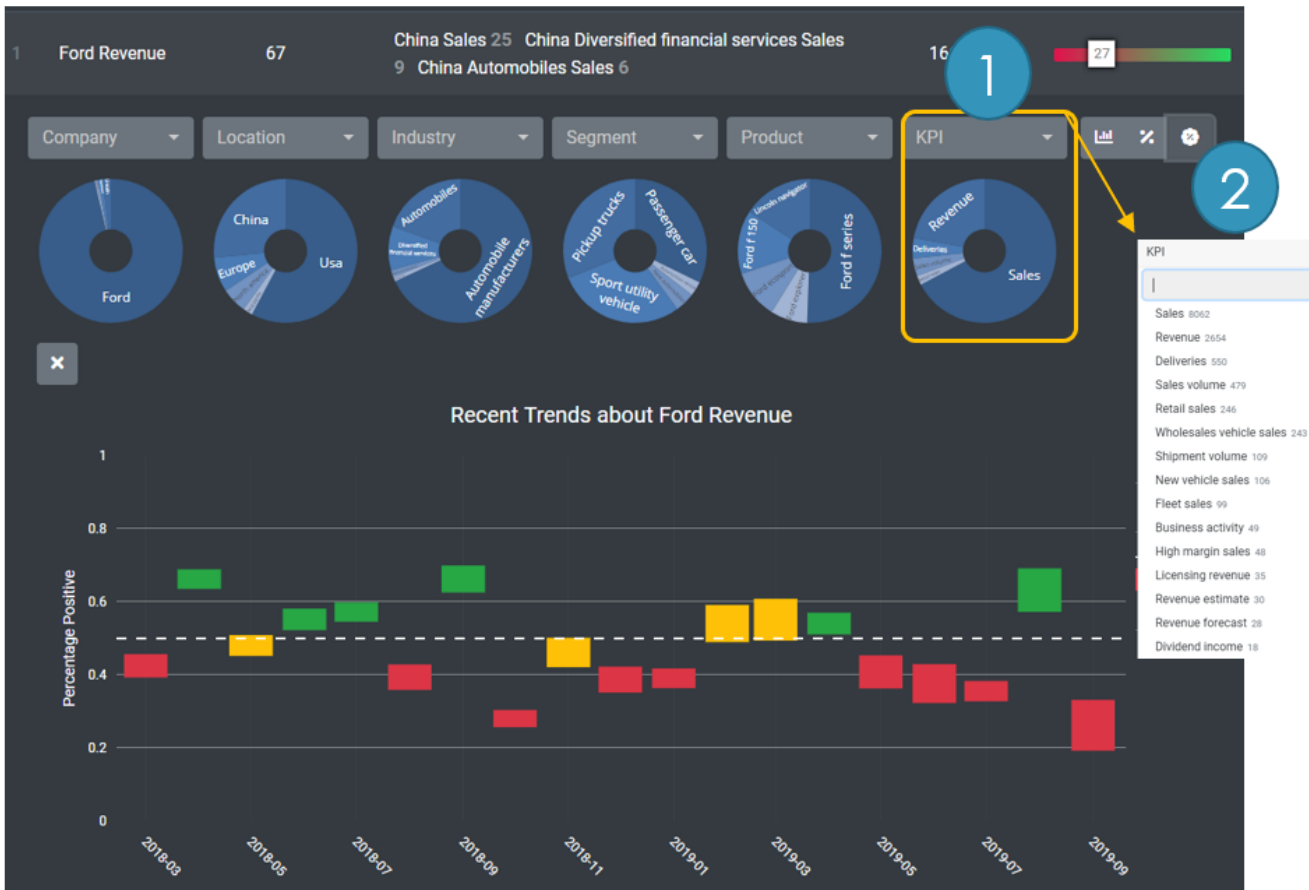

Sales emerges as the top KPI that is discussed as a sub-indicator of Revenue. Filtering on all of the statements around Ford Sales produces this trend chart:
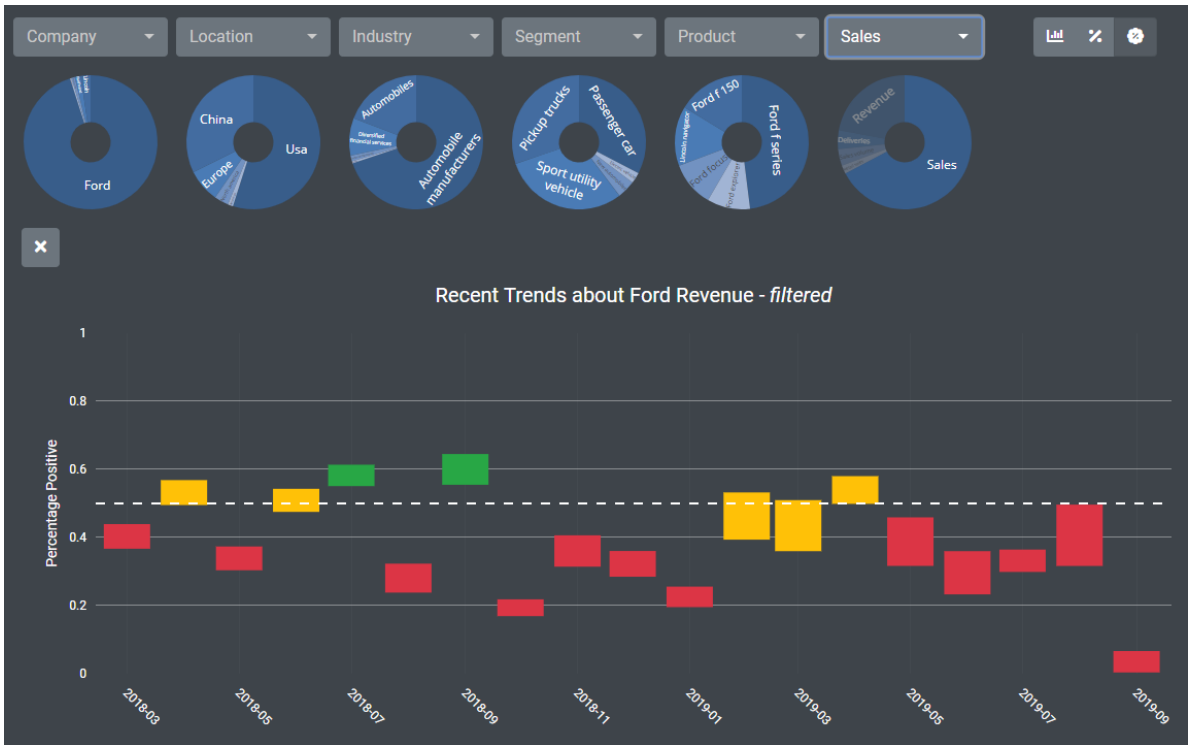
The analyst would see very clearly that the overall sentiment about Ford sales over the past 18 months has been overwhelmingly negative, without recovering after the July earnings announcement. Especially troublesome, however, is the very precipitous drop in these metrics in September. (Remember that we are not including any articles published after the Moody's downgrade announcement on September 9, 2019).

The analyst would also see that most of the articles about sales are focused on N. America and the second most are focused on sales in China. This is interesting to drill into because the analyst knows that Moody's is particularly focused on market share and profitability in China, so filtering into China Sales shows the following:
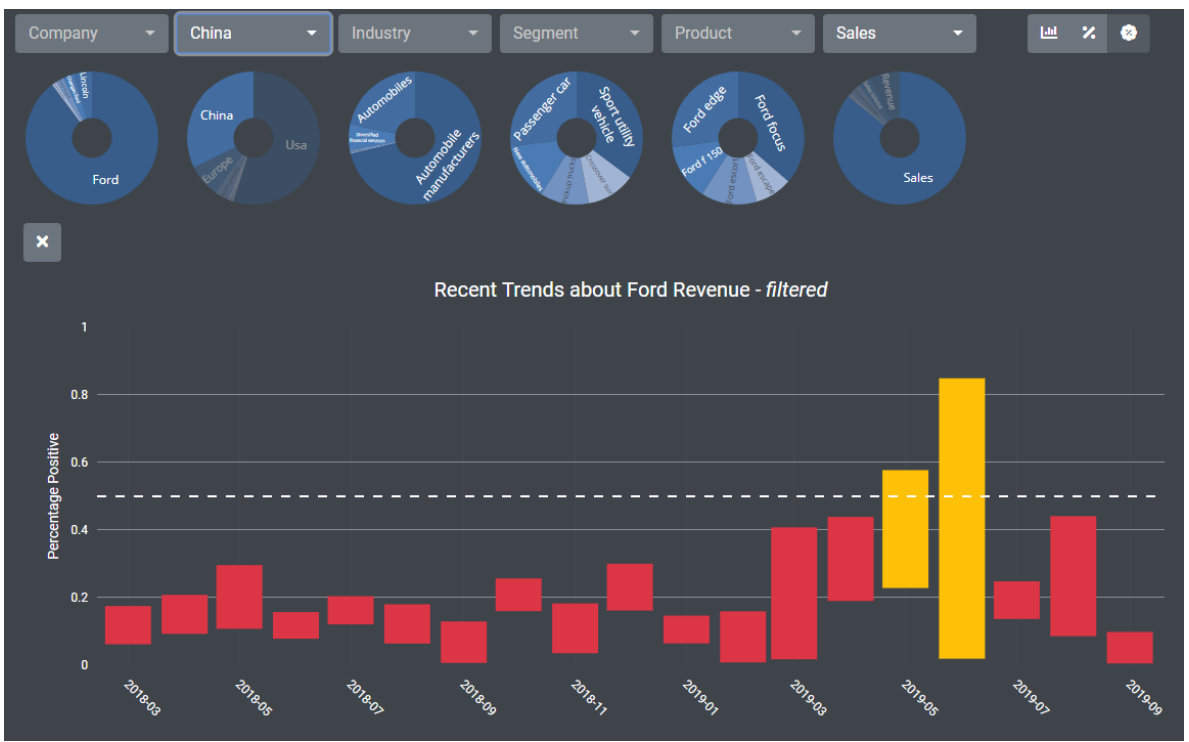
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The outlook in China is even worse than the global outlook. Sentiment on Ford sales in China have been strongly negative for most of the past 18 months, but with a particularly steep downward trend over the past 3 months. In other words, the collective opinion of the subject matter experts is that Ford is not achieving the improvements in the KPIs that could prevent the Moody's downgrade.

> *…the collective opinion of the subject matter experts is that Ford is not achieving the improvements in the KPIs that could prevent the Moody's downgrade.*

CONCLUSION

This analysis of the published documents leading up to but not including the recent Moody's downgrade indicates that contextual sentiment analysis of a large corpus of articles and documents does indeed have the potential to provide early warning signs of important drivers of financial markets, even mid-quarter. Additionally, the ability to quickly focus one's limited analysis time on reading articles that discuss indicators of special interest could give analysts an edge in identifying valuable nuggets of information that have not been widely discussed or fully linked together.