Market Sentiment

Research Progress Presentation
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Outline

What is on today's Agenda?

1. Research Project Introduction
2. Main Features of the Data
3. Cumulative Sentiment
4. Understanding More the News Dynamics
5. Task List of Points to Analyse Next
6. Next Steps
7. Some Example of the Sentiment Index
8. Discussion

Research Project Introduction

Creating a news sentiment index for the German equities market

Goal

- What are the key aspects of news impacting the stock prices?
- Is it possible to create a sentiment index that would predict major trends in stock prices?
- Test and assess the Machine Readable News.

Available data

- TickHistory data access (tick data Refinitiv)
- Machine Readable News History access
- Both for German-speaking countries (circa 10 years back history) equities data + DAX index

This data can be shared (up to 10 researchers)!

Main Features of the Data

We can follow much more than the pre-calculated sentiment

Date/Time	Comp	Source	Item Type	Item Genre	Headline	Relv	Prev Sentmt	Pos	Neut	Neg	1st Ment Loc	Total Sent	# of Cos	# of wds/ tkns	Tot-wds/ tkns	Broker Action	Price/MKT commentary	Item Ct	Lkd Ct	Topic Codes	Other Comp
01/05/2009 10:42:00.699	C	RTRS	ARTICLE	INTERVIEW	INTERVIEW-Philippines seeks underwriters for bond issue	0.35	-1	0.39	0.16	0.46	9	12	5	117	319	UNDEFINED	UNDEFINED	0	0	PH EMRG ASIA GVD DBT FRX ISU HYD FIN BNK INVS US DFIN CH BANK FUND MEVN BSVC FINS CEEU EUROPE WEU LEN RTRS	LEHMQ. PK C.N CSGN.VX UBSN.VX JPM.N
01/05/2009 13:02:12.042	C	RTRS	ALERT	NOT DEFINED	Deutsche Bank DEUTSCHE BANK CUTS CITIGROUP <C.N> 2010 SHR VIEW BY $0.40 TO $0.75	1	-1	0.06	0.13	0.82	1	1	2	14	14	DOWN-GRADE	UNDEFINED	9	2	DBT MTG DRV CORPD USC LOA BACT RES RESF RCH BANK BSVC FINS US BNK FUND LEN RTRS DFIN FIN	BAC.N C.N
01/08/2009 21:12:49.798	C	RTRS	ARTICLE	US STOCKS SNAPSH	US STOCKS SNAPSHOT-S&P 500, Nasdaq up; Dow off on Wal-Mart	0.20	-1	0.08	0.13	0.79	2	13	7	97	215	UNDEFINED	COMMENTARY	51	2	US STX FIN NEWS SOFW DPR ENT SFWR HARW HDWR SWIT TECH COMP TEEQ LEN RTRS FUND BNK	.DJI .SPX .IXIC MSFT.O AAPL.O

Features
- Sentiment: author tone
- Relevance: importance of an entity to the document –
- Novelty: has this text appeared earlier?
- Volume: amount of news volume on an entity
- General analysis, e.g., ratings change, market commentary flag
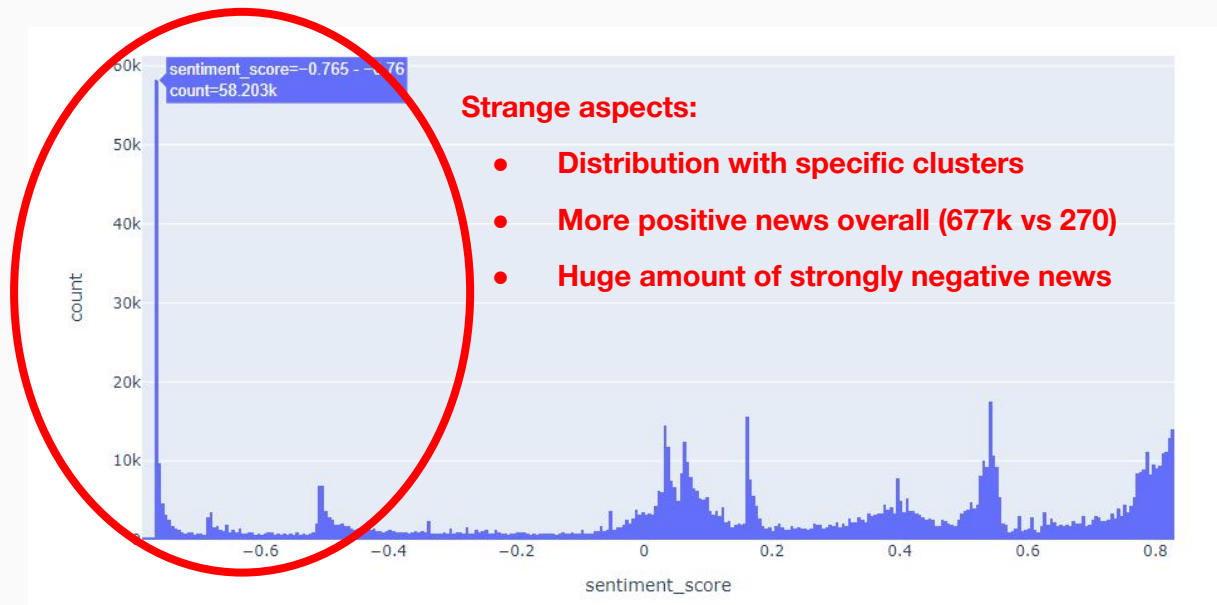
Source (Refinitiv Documentation)

Methodology
- Statistical: how many times "negative" appears. And how negative?
- Syntactical: which verb acts on which object? Adverb on verb?
- Semantic: "Q1 results were not very good." Intensification & word sense disambiguation

Source (Refinitiv Documentation)

Descriptive Stats for Sentiment (EMEA 2018)

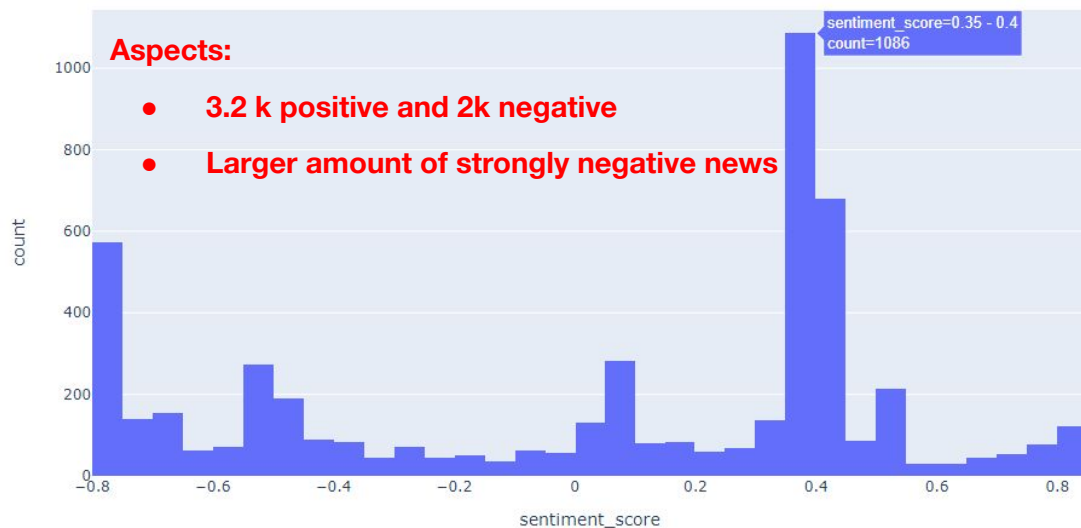## We have a quite unexpected distribution of the data overall

sentiment_score=−0.765 - −.76
count=58.203k

Strange aspects:

- **Distribution with specific clusters**
- **More positive news overall (677k vs 270)**
- **Huge amount of strongly negative news**

Summary for EMEA 2018 News

Count	947 358
Mean	**0.17**
Std	0.49
Min	-0.78
25%	-0.08
50%	0.18
75%	0.55
Max	0.83

Descriptive Stats for Sentiment (DBK 2018)

DBK example shows the same "weird pattern" on the stock level.

Aspects:

- **3.2 k positive and 2k negative**

- **Larger amount of strongly negative news**

sentiment_score=0.35 - 0.4
count=1086

Summary for EMEA 2018 News

Count	5 266
Mean	**0.29**
Std	0.49
Min	-0.78
25%	-0.49
50%	0.25
75%	0.40
Max	0.83

Cumulative Sentiment

Let's see how the sentiment evolves if we define it as a cumulative sum over each news item sentiment score.

News and price development

➔ Noise very likely in the data - stock dropping despite positive sentiment culminating in the first quarter.

➔ Overall there is 50% more positive news than negative.

Understanding More the News Dynamics

To get more insight on how the news price-in, I prepared a "visualisation tool". We can spot some interesting days.

News and price development

Event Description (2.2.2018)

- Before the open Deutsche Bank reports negative results that are below expectations
- A negative open is followed by an aggressive sell off
- During the day we can see a recovery but overall the day ends in the red
- DAX follows the pattern - not clear to what extent (were there any global news too?)

Understanding More the News Dynamics

… and there are also some not interesting days.

News and price development

Event Description (6.2.2018)

- Only stock-specific significant news Bankhaus reduces price target from 18 to 17 EUR.
- We can see just noise data in the stock-specific news.
- The cause was most likely negative sentiment on European banking stocks.

Understanding More the News Dynamics

Not many interesting news on that day - really.

Sentiment Score	Headline
0,35	REG - Deutsche Bank AG SKY PLC - Form 8.5 (EPT/NON-RI) Sky Plc<DBKGn.DE><SKYB.L>',
0,37	REG - Deutsche Bank AG SKY PLC - Form 8.5 (EPT/RI) Sky Plc<DBKGn.DE><SKYB.L>',
0,37	REG - Deutsche Bank AG Hammerson PLC - Form 8.5 (EPT/RI) Hammerson plc<DBKGn.DE><HMSO.L>',
0,37	REG - Deutsche Bank AG Intu Properties PLC - Form 8.5 (EPT/RI) Intu Properties plc<DBKGn.DE><INTUP.L>',
0,37	REG - Deutsche Bank AG Ladbrokes Coral Grp - Form 8.5 (EPT/RI) Ladbrokes Coral Group plc<DBKGn.DE><LCL.L>',
0,37	REG - Deutsche Bank AG GVC Holdings PLC - Form 8.5 (EPT/RI) GVC Holdings plc<DBKGn.DE><GVC.L>',
-0,76	DEUTSCHE BANK AG <DBKGn.DE>: BANKHAUS LAMPE CUTS PRICE TARGET TO EUR 17 FROM EUR 18',
0,81	DEUTSCHE BANK AG <DBKGn.DE>: BANKHAUS LAMPE SAYS STILL BELIEVES THAT SUSTAINABLE ROTE OF AT LEAST 8 PCT IS ACHIEVABLE',
0,07	DEUTSCHE BANK AG <DBKGn.DE>: BANKHAUS LAMPE SAYS "BREXIT AND MIFID WEIGH ON COSTS"',
0,35	REG - Deutsche Bank AG Hammerson PLC - Form 8.5 (EPT/NON-RI) Hammerson plc<DBKGn.DE><HMSO.L>',
0,41	REG - Deutsche Bank AG Hammerson PLC - Form 8.3 - Hammerson plc<DBKGn.DE><HMSO.L>',
0,40	REG - Deutsche Bank AG SKY PLC - Form 8.5 (EPT/RI) Sky Plc- Amendment<DBKGn.DE><SKYB.L>',
-0,76	DEUTSCHE BANK US SHARES FALL 4.7 PCT IN PREMARKET TRADE',
-0,76	"BREAKINGVIEWS-Volatility good and bad for Europe's bank chiefs",
-0,49	"BREAKINGVIEWS-Volatility good and bad for Europe's bank chiefs",
0,36	REG - Deutsche Bank AG Ladbrokes Coral Grp - Form 8.5 (EPT/RI) Ladbrokes Coral Group plc<DBKGn.DE><LCL.L>',
-0,76	BREAKINGVIEWS-Rocky 2017 leaves SocGen with a mountain to climb',
0,35	REG - Deutsche Bank AG SKY PLC - Form 8.5 (EPT/RI) Sky Plc- Amendment<DBKGn.DE><SKYB.L>',
0,67	BREAKINGVIEWS-Commerzbank now merits suitors as well as pity',
-0,47	"Meltdown raises fears of 'financial innovation the planet doesn't really need'",
0,75	FACTBOX-Big Tech to weed killers: Impact of German coalition deal'

Task List of Points to Analyse Next

I am still looking for relevant factors.

Quick Wins

- Words that are most often related to news with large sentiment.
- Words after which strong volatility is present (same direction as sentiment, same direction each time for the word).
- How many news are there on days with large shifts?
- Are no news good news (or vice versa)?
- Do sequences of good (bad) news matter? What are the aspects that make these sequences significant.

More complex tasks

- Can we somehow estimate the half-life of the impact of the news (i.e. the time after which the news items impact "dies away")?
- Post-results drift - validate the hypothesis.
- Covid years: is the impact of sentiment stronger?

Next Steps

I am in the beginning of the initial analysis and I need to get more view on the dynamics now.

- **Initial data analysis, getting more insights**
  - Address the quick wins
  - See what can be done on the more complex tasks
  - Pile-up on the literature review
    - Sentiment-related extensive, dynamics-related not much

- **Study elaboration**
  - Extraction of all of the data
  - Event study design and elaboration
    - News sentiment for the previous n minutes (days) and expected impact on the volatility past m minutes (days)

- **Current Blockers**
  - 2020 data from Refinitiv have bugs (fixing in progress)

Some Example of the Sentiment Index

I was just playing with the data to see a bit how the sentiment index might look like.

Assumptions

- Only relevant news considered (no news before 24 hours on the same topic).

- Some degree of die away factor used for each news item.

- All news taken into consideration.

Questions & Discussion

I will be very grateful for any tips, hints and suggestions how to improve and advance faster in the research.