



Twitter Analytics on Companies, Executives, and COVID-19

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<https://rmc.link>

Firm tweets

“Discretionary Dissemination on Twitter”

With Wenli Huang and Hai Lu

Questions

- How do firms use Twitter for financial dissemination?

💡 Hypothesis

The likelihood of posting financial tweets increases with the materiality of accounting news events, **irrespective of the direction of the news** (positive or negative).

Firms post *financial tweets* more often around more material accounting news

- This is irrespective of the direction of the news (positive or negative)
- A loose test of theory: Hummel, Morgan, and Stocken (2021 Working)

Example firm financial tweets

Goldman Sachs 

@GoldmanSachs · [Follow](#)



GS reports 2014 net rev of \$34.53bn, net earnings of \$8.48bn, & 11.2% ROE; 4Q net rev of \$7.69bn, net earnings of \$2.17bn and 11.1% ROE

8:37 PM · Jan 16, 2015



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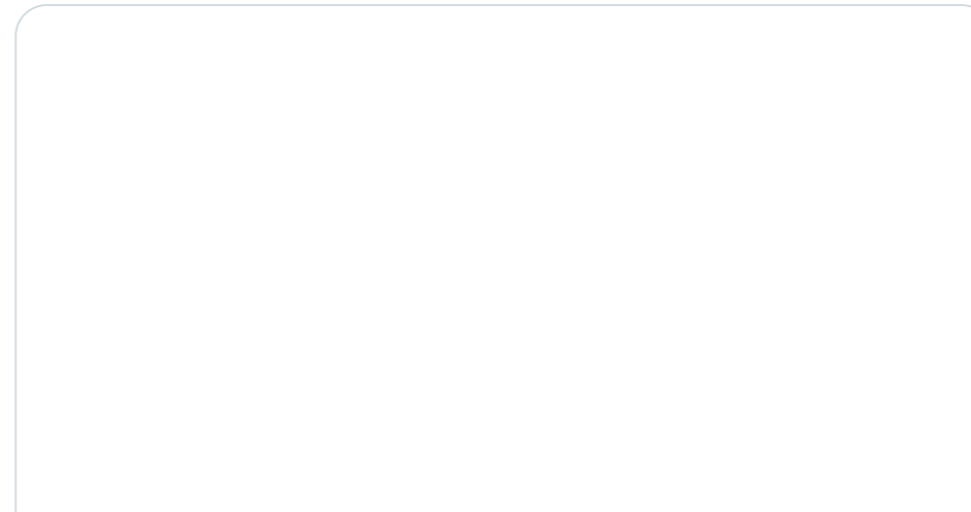
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The Boeing Company 

@Boeing · [Follow](#)



Boeing reports strong third-quarter results; raises revenue, EPS and cash flow guidance:



boeing.mediaroom.com

Boeing Reports Strong Third-Quarter Results; Raises Revenue, EPS a...

Table 1. Summary Financial Results Third Quarter Nine months
(Dollars in Millions, except per share data) 2015 2014 Change 2015 ...

8:17 PM · Oct 21, 2015

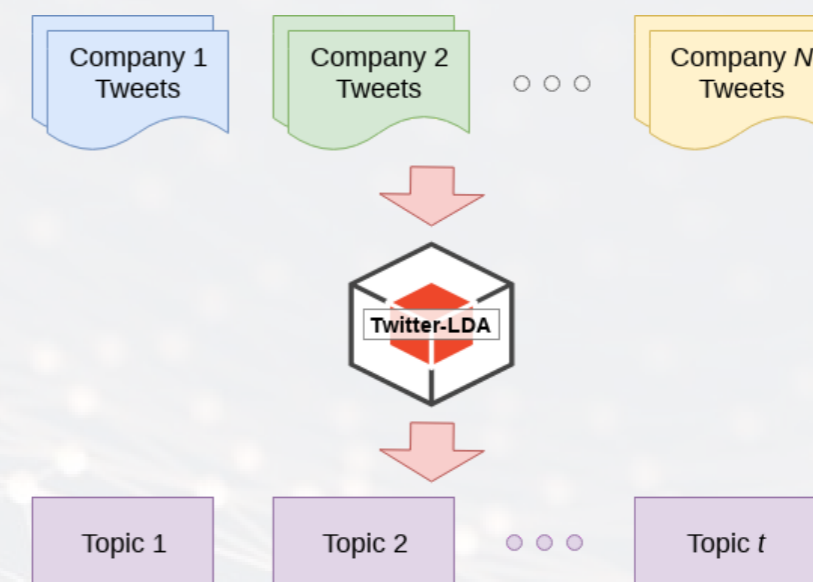


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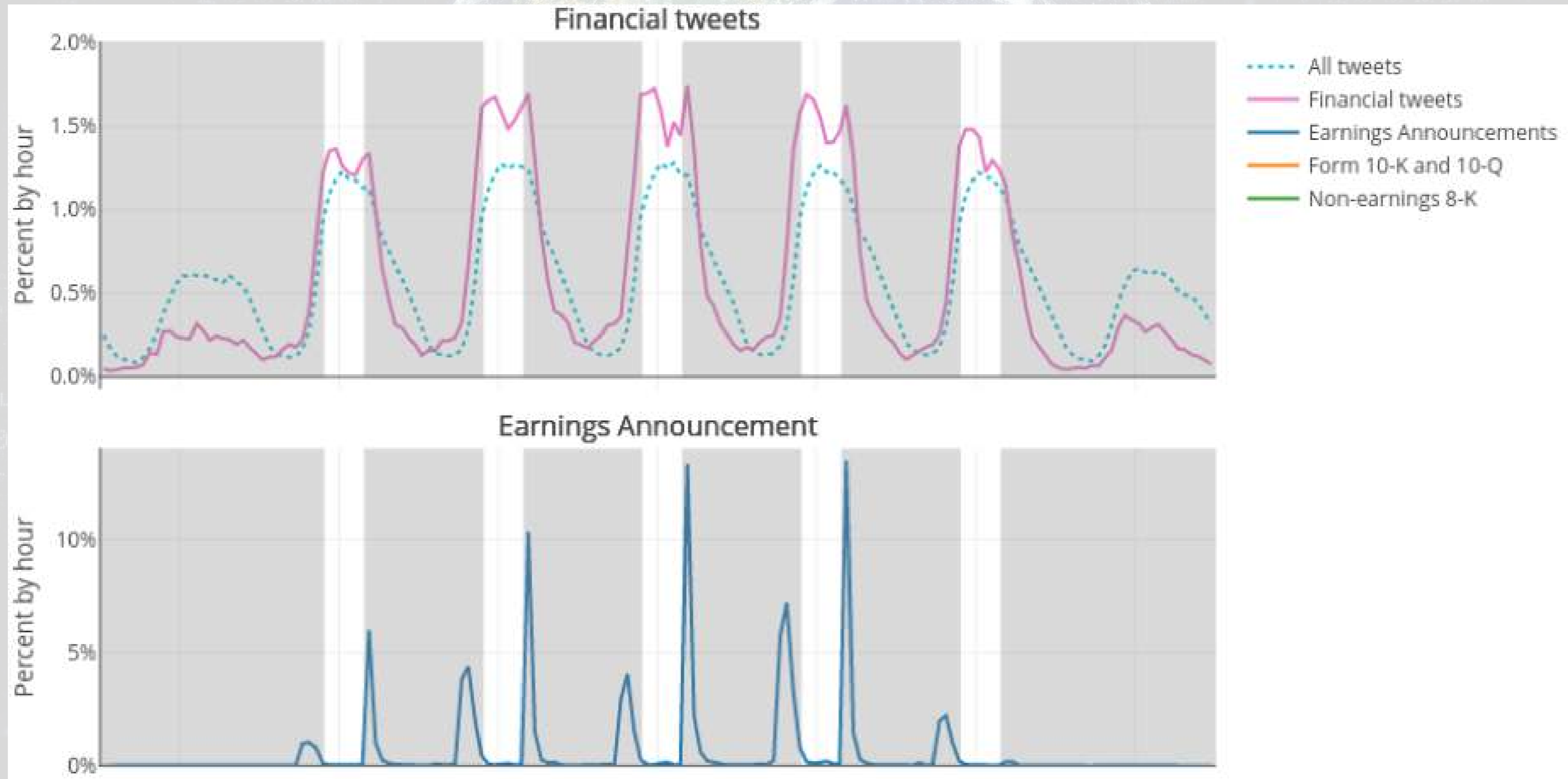
Classifying tweets

- Classify using Twitter-LDA
- Identify 60 topics
 - 1 financial topic
 - 42 nonfinancial topics
 - Business, conferences, marketing, and support
 - 17 other topics

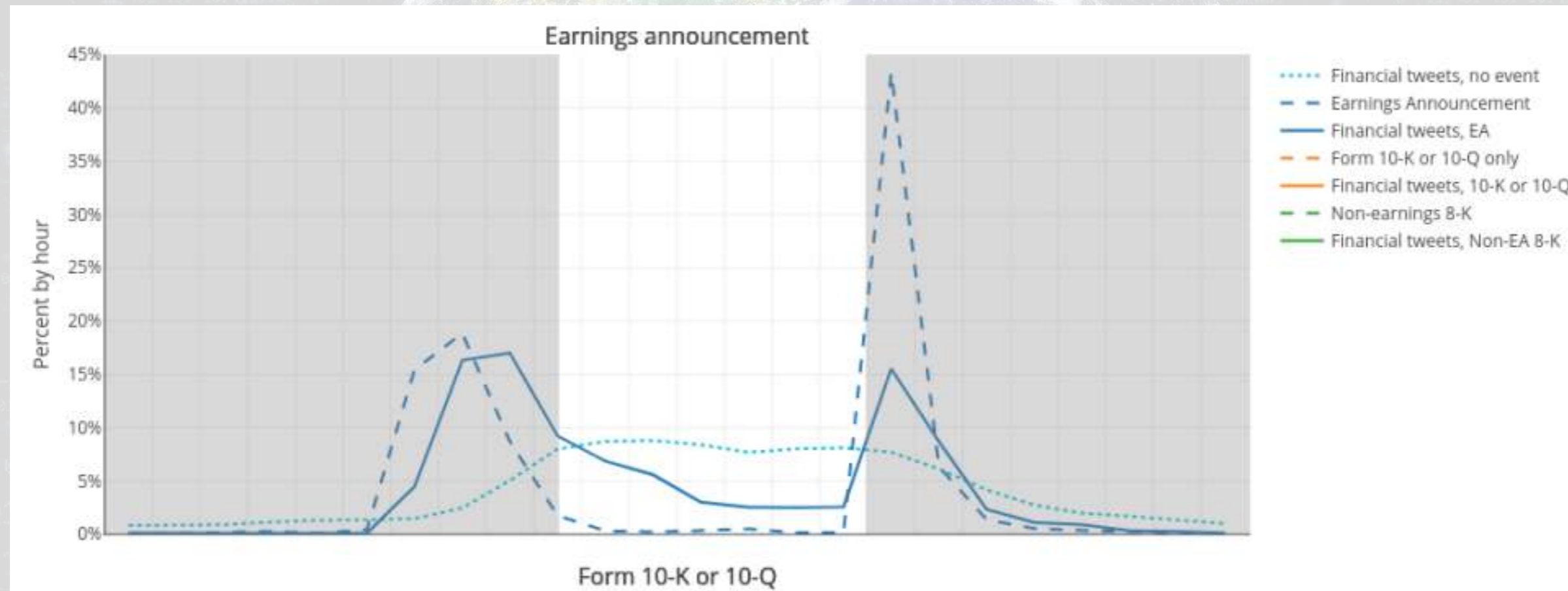


Number	Topic	Top_words
23	Financial	market, growth, markets, trading, earnings, global, report, quarter, results, energy
2	Nonfinancial: Marketing	#shareacoke, make, #tastethefeeling, gifs, reply, mistletoe, happy, tweets, #makeithappy, hashtag
12	Other	el, paso, police, trump, obama, man, city, donald, news, york

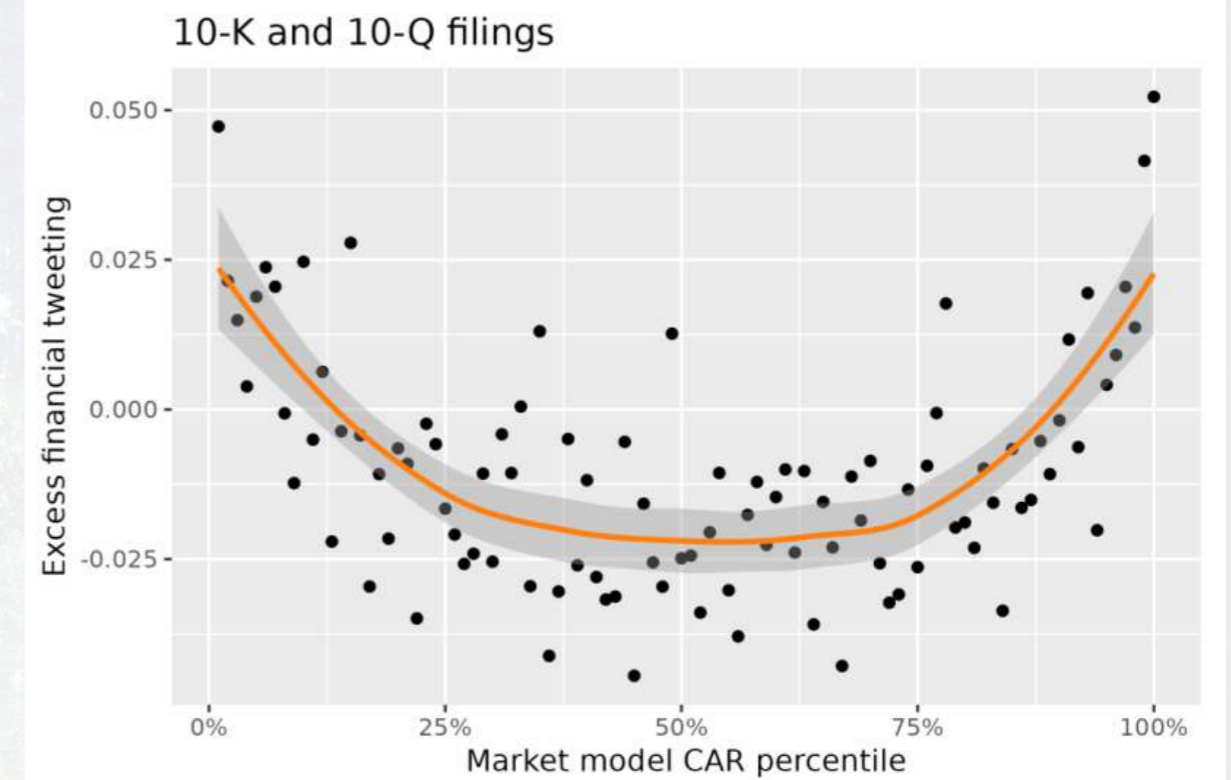
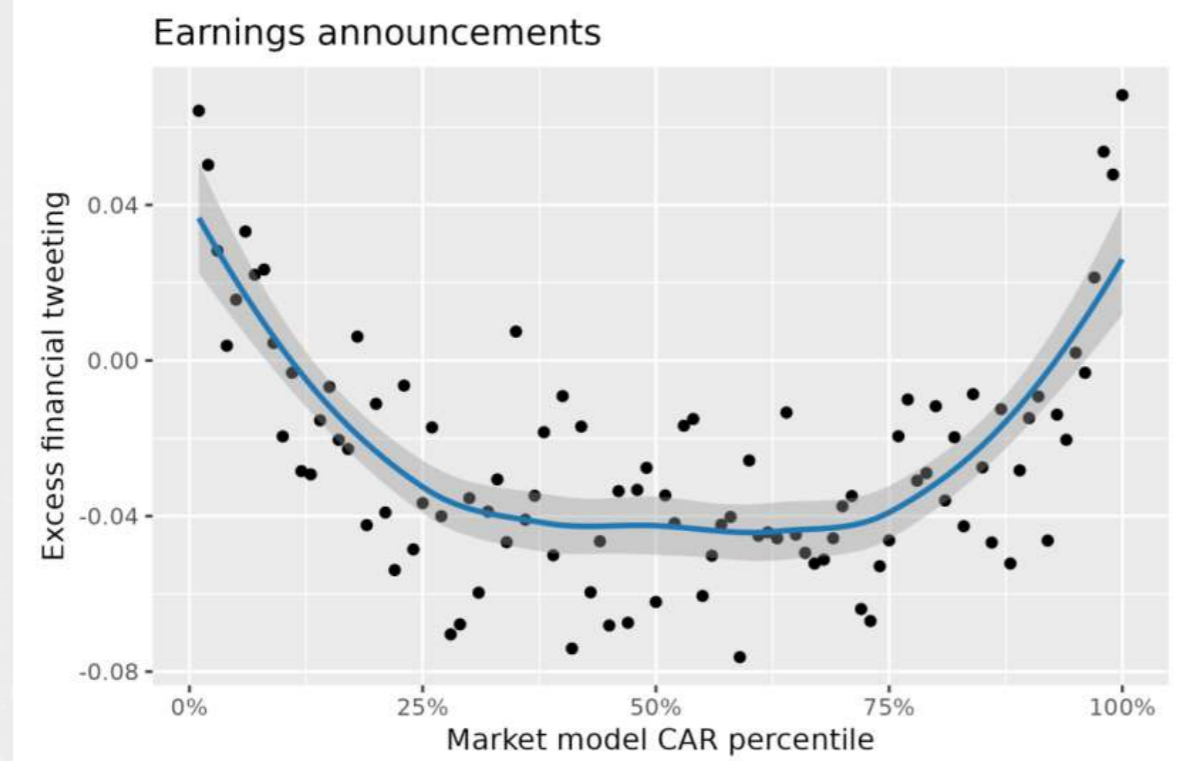
Tweeting behavior intraday



Financial tweets and Financial events



Financial tweets and event direction





CEO and CFO tweets

“Executive tweets”

With Wenli Huang and Hai Lu

Questions


- What drives exec adoption of Twitter?
- Do executives view Twitter as an important channel for disclosure?

💡 Hypotheses

1. The market **responds to executive financial tweets** in addition to firm tweets.
2. The market responds more weakly (strongly) to executive tweets with content similar to firm tweets.
 - Weakly: *new information mechanism*, the market reacts to new information content posted by executives
 - Strongly: *trust mechanism*, the market reacts due to stronger social bonds with individuals than firms

We find strong evidence for *trust*, some evidence for *new information*

Example financial exec tweets (Business)

Omar Ishrak 

@OmarIshrak · [Follow](#)



Continuing to execute in both our product & SG&A cost reduction initiatives will provide consistent EPS leverage [#MDTEarnings](#)

7:05 AM · Feb 20, 2013



 2  Reply  Share this post

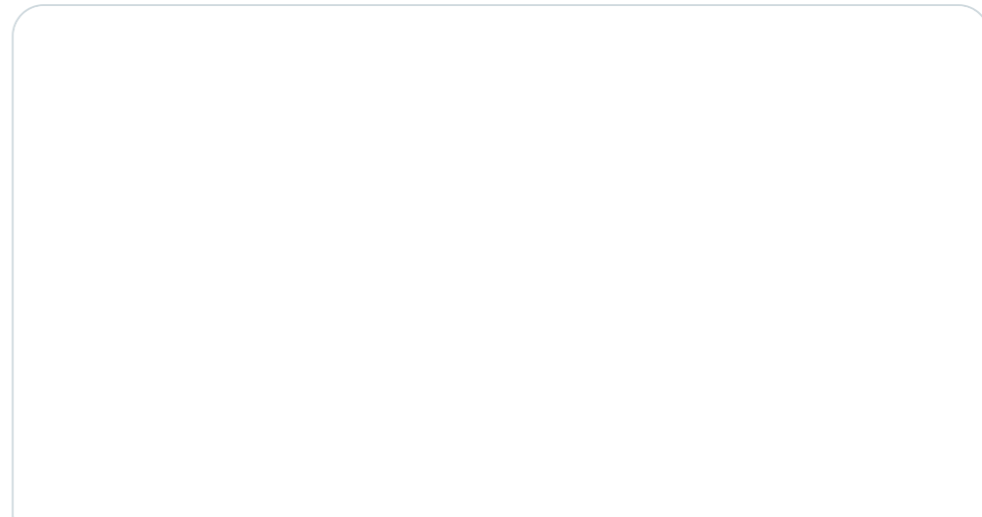
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Matt Desch 

@IridiumBoss · [Follow](#)



Good summary of our recent quarterly earnings call: satellitetoday.com/telecom/2014/0...



satellitetoday.com

Iridium Sees Major M2M Growth, Keeps Pace with Iridium NEXT - Vi...

Iridium has signed a major contract with a prominent Original Equipment Manufacturer (OEM) for use of its satellite services. Matt ...

1:08 AM · Aug 3, 2014



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Example non-financial exec tweets

Mark T. Bertolini

@mtbert · [Follow](#)



Arriving in Atlanta. A day meeting with customers is better than any day in the office. But I do love all the folks back in Hartford too :o)

12:12 AM · Feb 28, 2012



Reply



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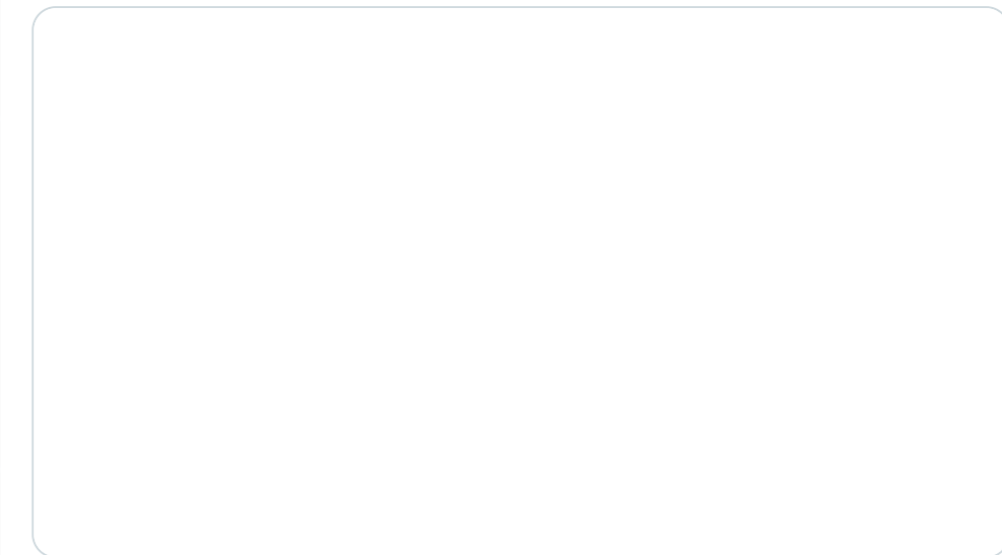
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Carl Bass

@carlbass · [Follow](#)



Another great day of spring skiing in the Alps



12:59 AM · Apr 11, 2014



4



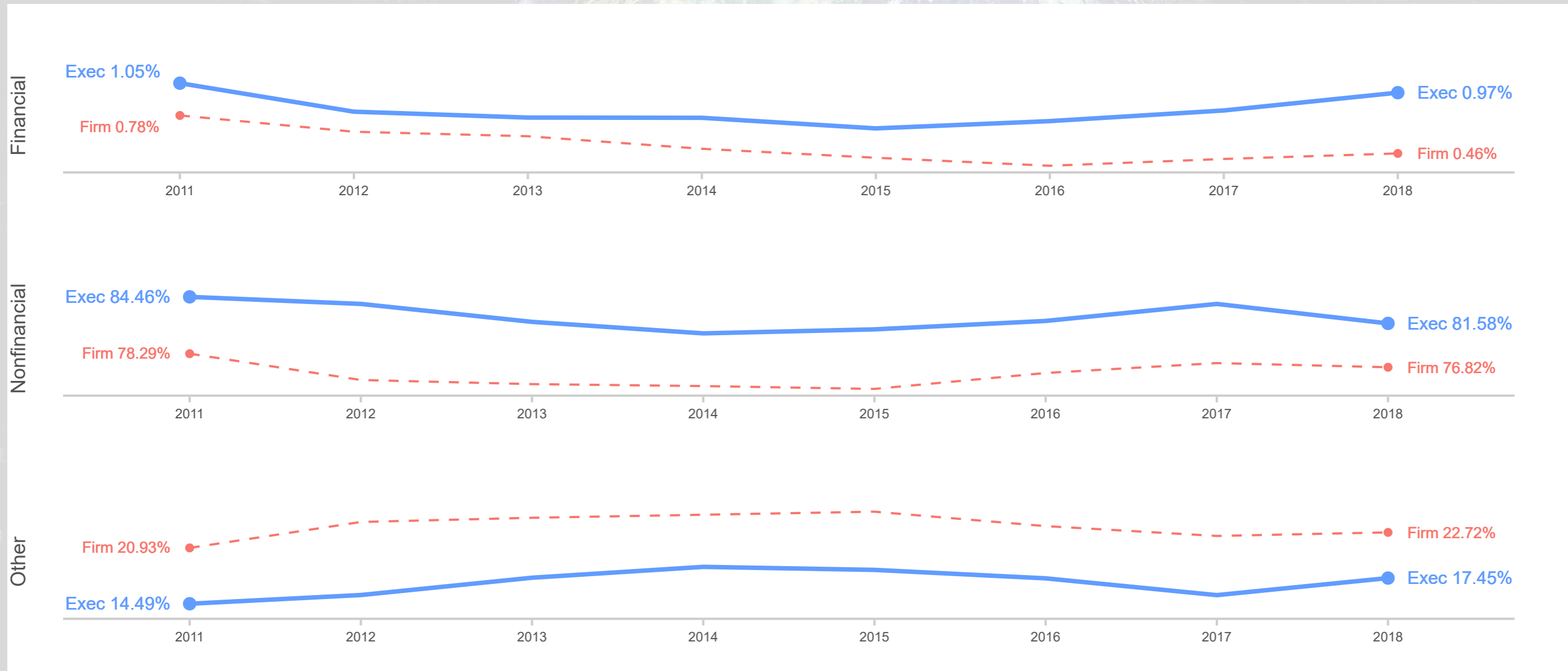
Reply



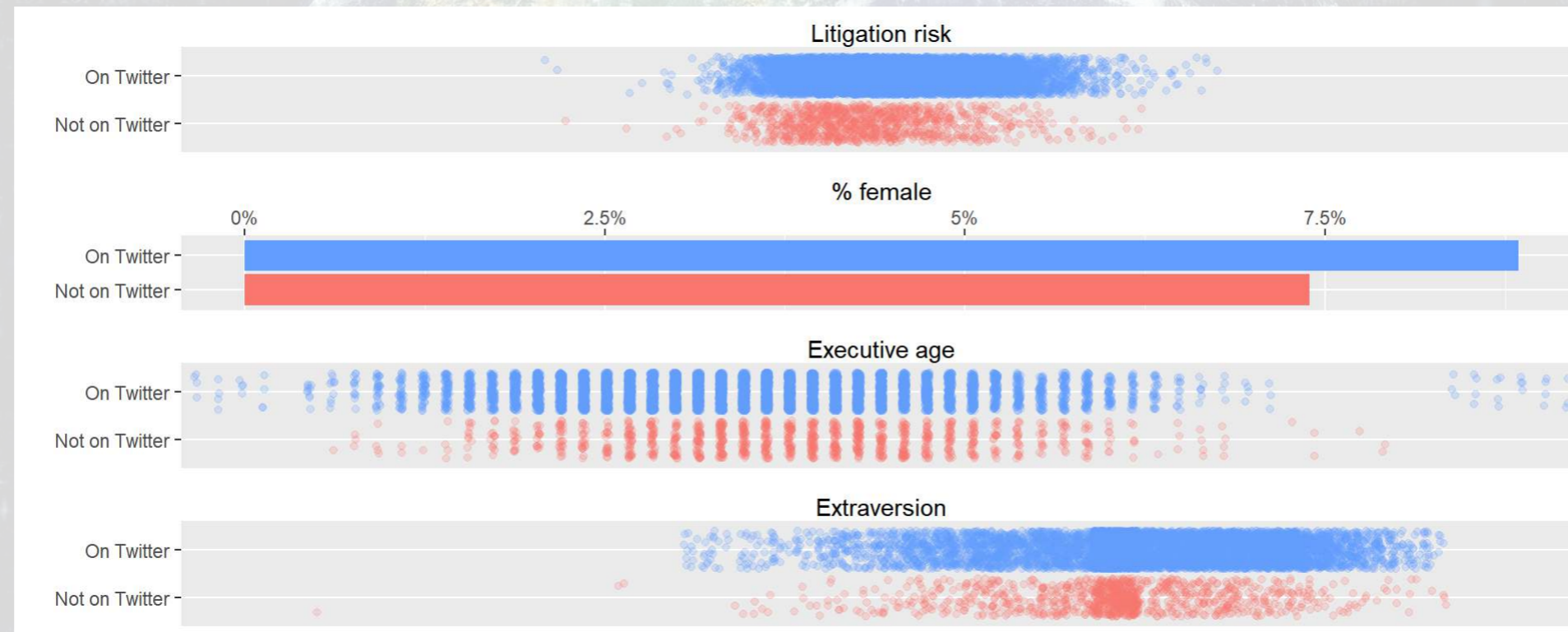
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Tweet content over time

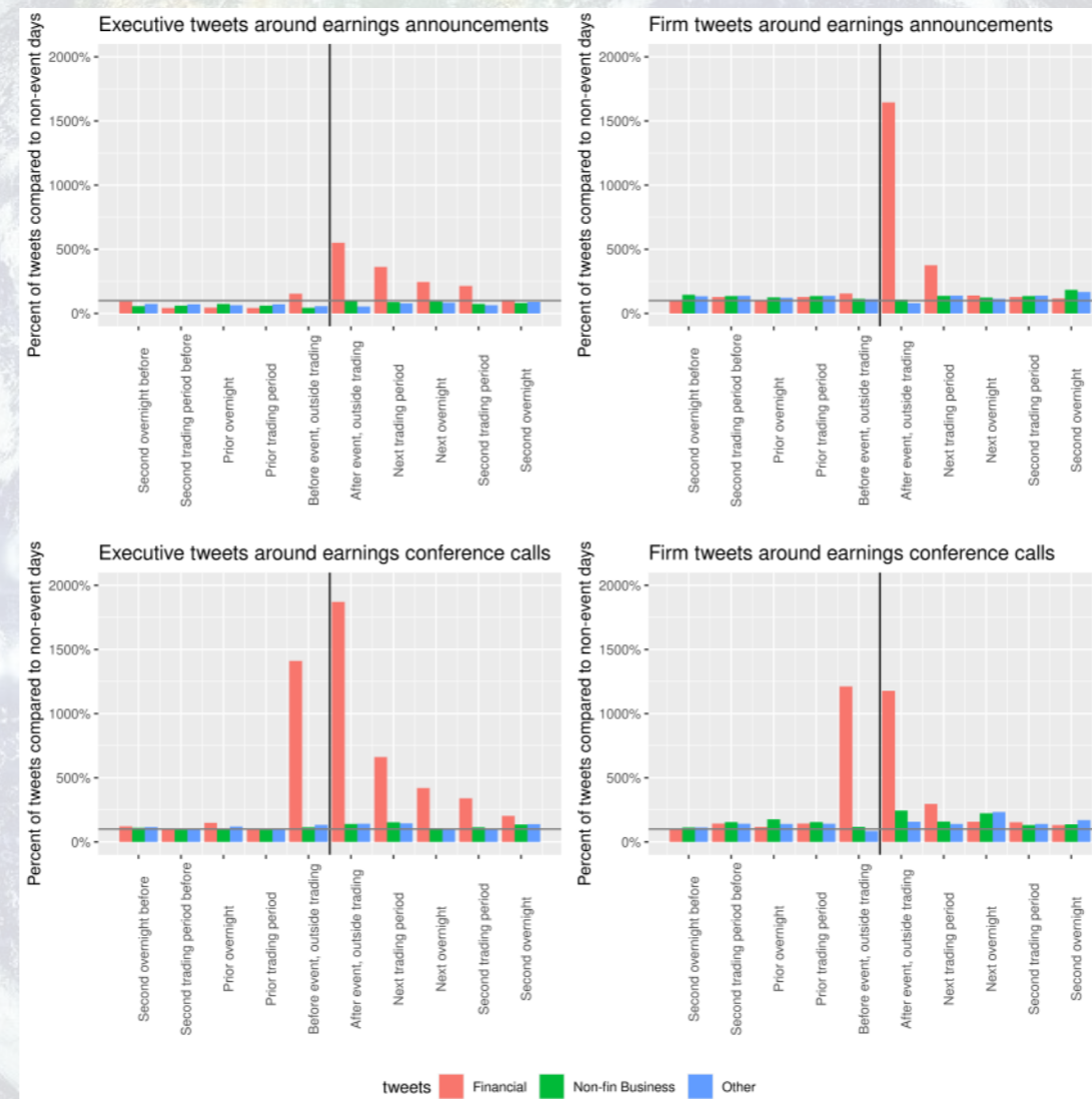


Executive adoption of Twitter



Adoption is higher when younger, female, extroverted, or facing higher litigation risk. SEC's 2013 guidance lowers adoption rate at high litigation risk firms.

Executives' discretionary tweeting



Executives seem to view Twitter as an important disclosure channel

Executives Drive Stock Returns

Variable	MMR_t	$ MMR_t $
Fin tweets, Exec	0.003** (2.04)	0.005*** (3.80)
Fin tweets, Firm	0.000 (0.22)	0.001*** (3.86)
Controls	Yes	Yes
Firm, Exec, Year, and Month FE	Yes	Yes

Executives' financial tweets lead to investor reaction beyond that of firms

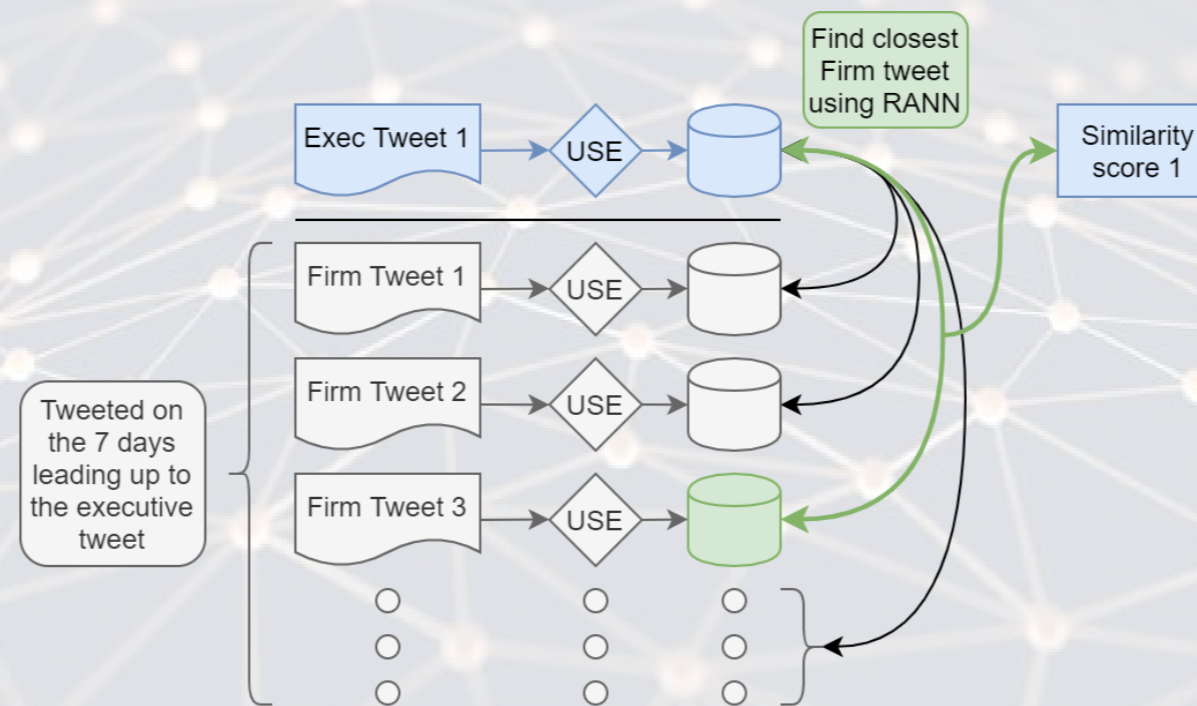
Market Reaction Mechanism: Trust

Variable	MMR_t	$ MMR_t $
Fin tweets, Exec	-0.050*	-0.044***
	(-1.81)	(-2.59)
Fin tweets, Exec \times Similarity	0.129*	0.117***
	(1.79)	(2.71)
Fin tweets, Exec \times No firm tweets	0.052*	0.048***
	(1.84)	(2.79)
Controls	Yes	Yes
Firm, Exec, Year, and Month FE	Yes	Yes

Result is consistent with *trust* driving investor reaction to exec financial tweets.

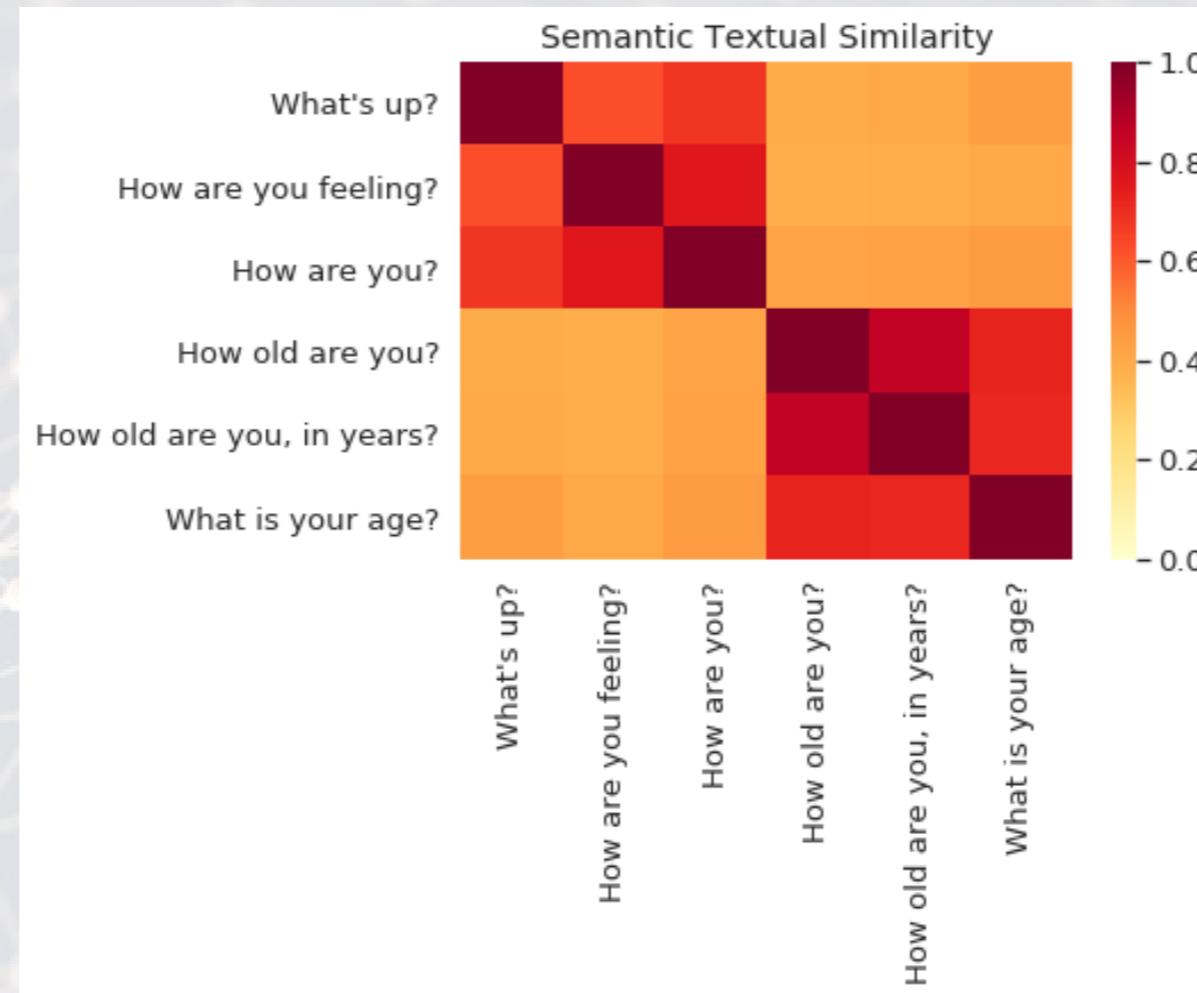
Methodology: Trust vs Information

We identify how *content-wise* similar each exec tweet is to corresponding firm tweets via **Universal Sentence Encoder (USE)**.



USE is a neural network method that relies on word **meaning** and word **order** to determine sentence meanings. It does not rely on word choice.

USE example



USE abstracts away from word choice!



COVID-19 tweets

WIP with Hai Lu and Jee-Eun Shin

Large scale data exercise

- This project is pushing into “Big Data” territory
 - 1.1 *billion* unique messages gathered
 - 25+ languages
 - 190+ countries, territories, and regions

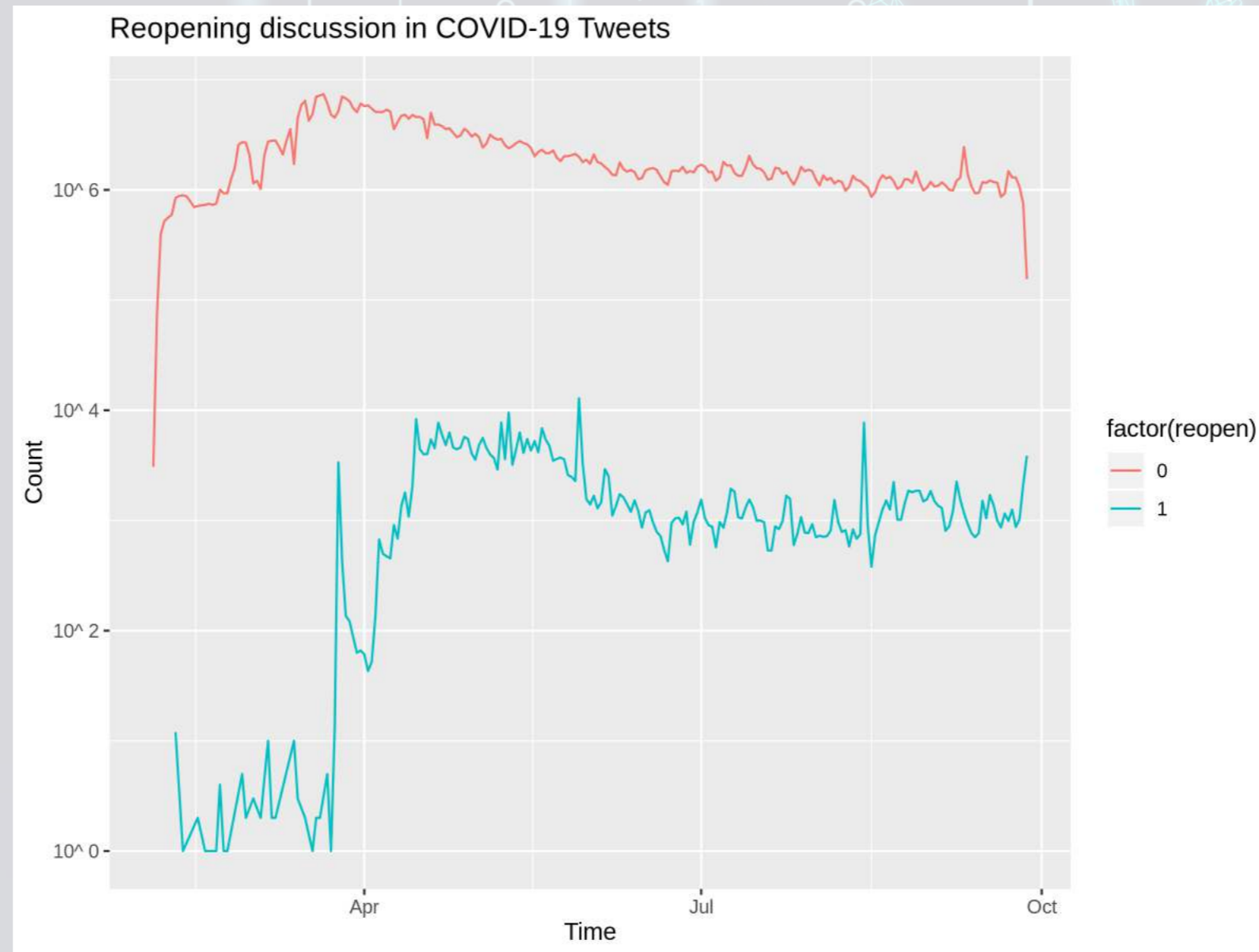
Project's goal

1. To understand, at a macro level, why some economies reopen and others don't, based on the local sentiment
2. To understand the impact of local sentiment on economic activity post-reopening

Emotion to COVID on social media

Variable	<i>Anger</i>	<i>Disgust</i>	<i>Fear</i>	<i>Joy</i>	<i>Sadness</i>	<i>Surprise</i>
Post Lockdown	13.1	12.4	-110.3***	44.2	18.6**	22.0
	[8.53]	[9.23]	[53.0]	[34.4]	[7.28]	[17.0]
Control: amount of discussion	Yes	Yes	Yes	Yes	Yes	Yes
Country, Weekday, Month, and Year FE	Yes	Yes	Yes	Yes	Yes	Yes

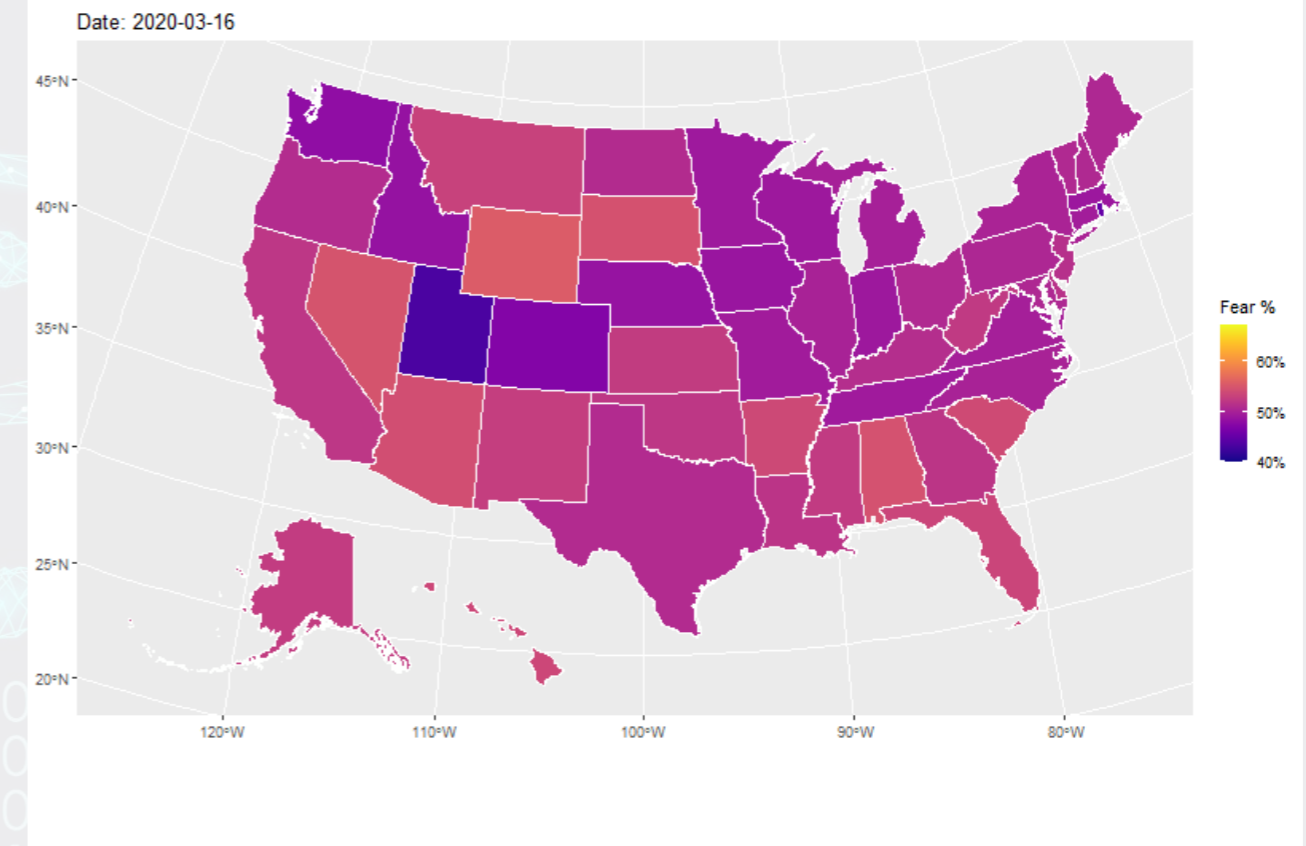
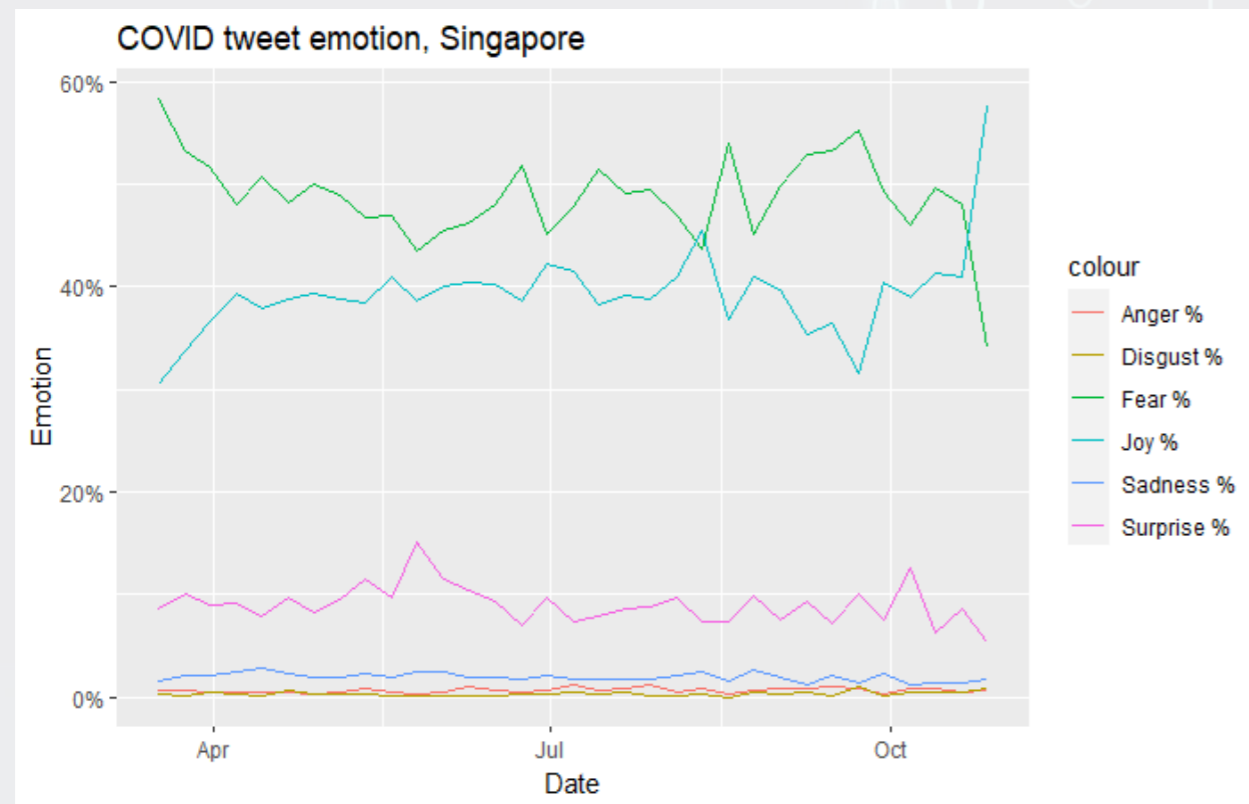
Reopening vs other discussion



Applications of broad measures to accounting

How does a populace's emotion about reopening with COVID impact economic recovery?

- Examine tweets to capture emotion at fine-grained geographic and temporal scales
 - State-day level variation in fear, sadness, anger, joy, and surprise



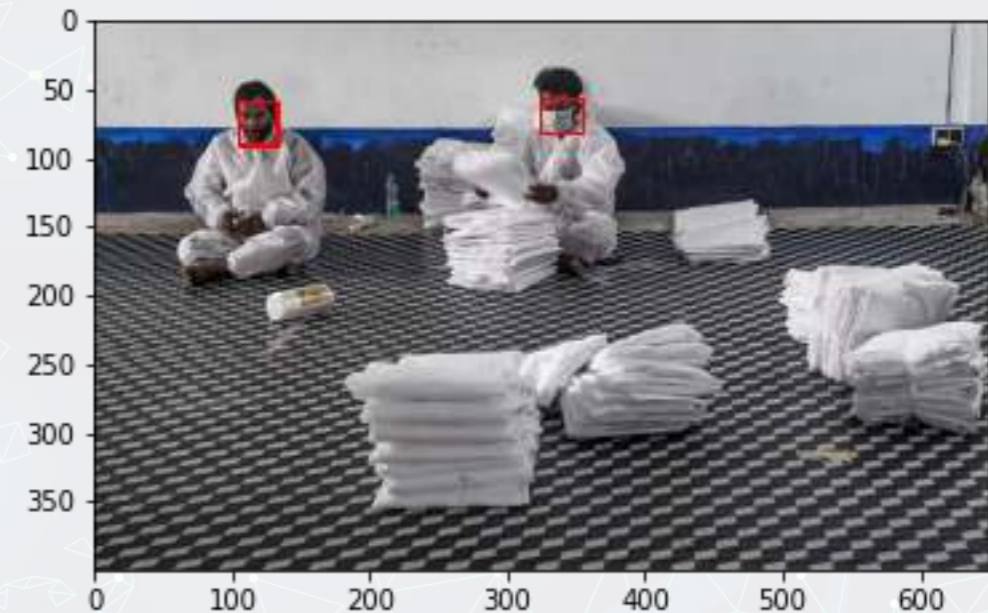
Mask depiction and emotions

- Tweets:
 - Feb-Oct 2020
 - Singapore-based users
 - English language text
 - Hashtag about COVID in the text

Over 13,000 images in this sample that include people in them

- Use computer vision to pick out masks
 - 3 class model: no mask, mask, or mask worn improperly

In SG, those that post pictures of people wearing masks properly exhibit ~5% less fear than those that post people without masks on ($t = 586$)



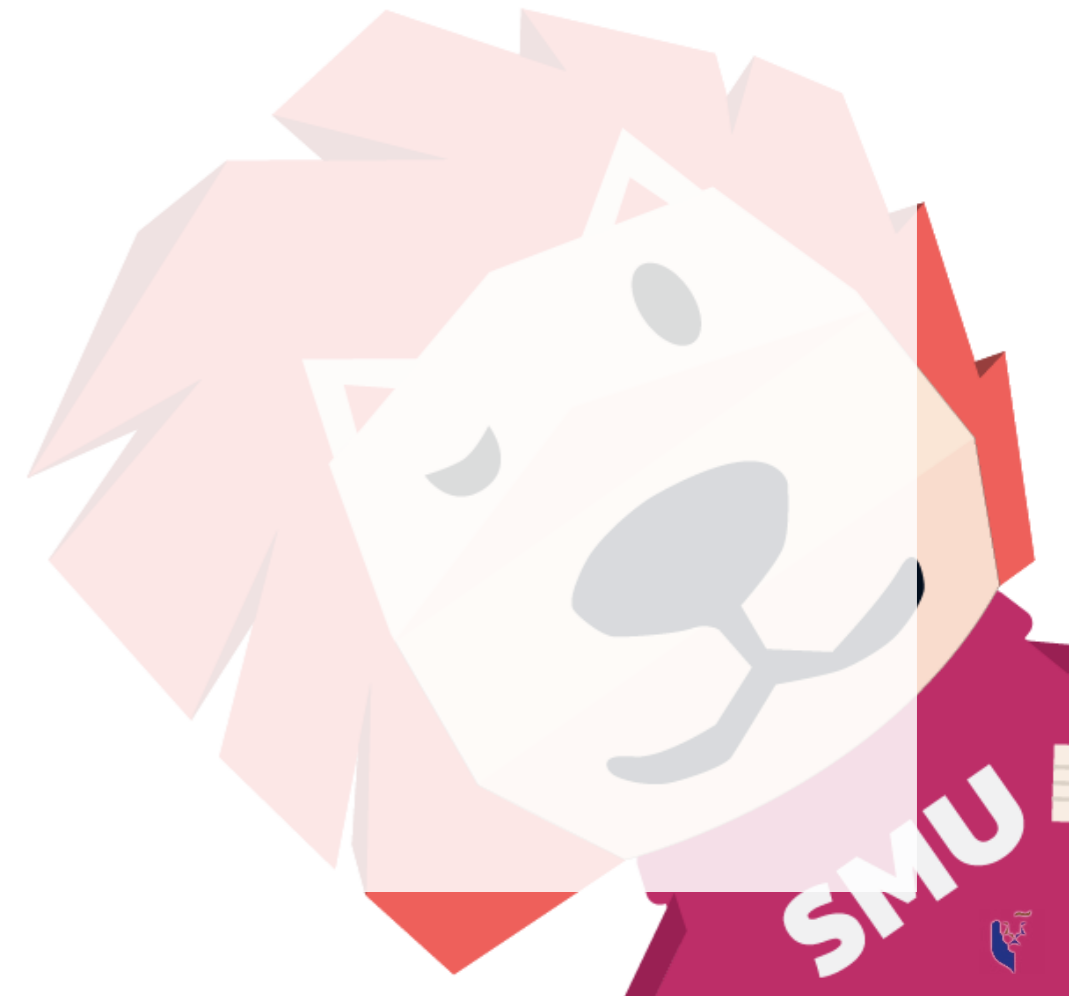
An image of a person wearing a mask incorrectly

- E.g., per the model, the guy on the left has his mask on incorrectly

Thanks!

Questions?

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rmc.link/



Packages used for these slides

- `downlit`
- `ggplot2`
- `ggthemes`
- `gridExtra`
- `kableExtra`
- `knitr`
- `quarto`
- `revealjs`
- `tidyverse`

