News Impact in Stock Market

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Research Motivation

We examine if Twitter news feed has an impact over stock market prices. This is accomplished by rejecting the null that the news have no significant impact on prices.

General Process

If the null does not hold true, then the stock price rates should be partially reflected from the news.

Therefore, we construct a comprehensive quantitative index to describe the substitution and complement effects as well as the possibility of external shocks from the stock market.

This index is used as labels to identify connections between the tweets and stock prices and reject the null.

Data Acquisition & Preparation

We implemented three abstract algorithms to automatically collect data from a collection of queries, paging and tabulate them.

We used these queries to acquire tweets from Intel, AMD and Nvidia and their stock prices over one and half year period.

Then, we create buckets of tweets according to the operation of Stock Market i.e Monday to Friday from 09:30 to 16:00 and merge the buckets during holiday seasons.

Cross Sectional to Time Series

Every bucket of tweets is treated as an unknown signal that partially influences the targeted stock, which is the signal receiver.

However, we assume there is a latency between the transmission, the reception, the evaluation and the final response to the signal.

Thus, we expand our analysis over a variety of lags between the transmission and the response. The graph below shows an example impact between tweets and stock changes over a 5 day period with a 24 hours lag.
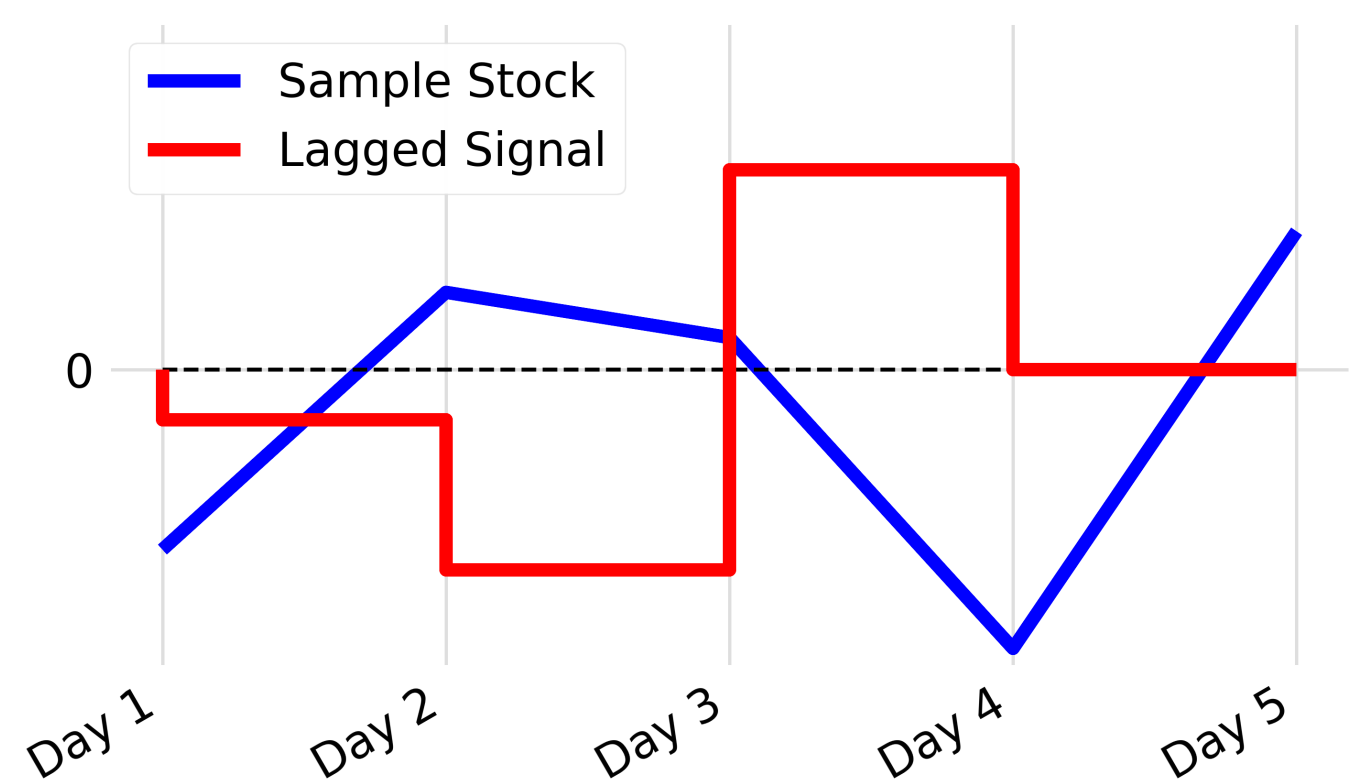
Analysis & Index

The companies selected offer substitute products in technology industry, but they are complements to industrial shocks. Also, the stocks are assumed as portfolio substitutes, but complements against NASDAQ technology index.

To measure the stocks' substitution and complement effects we examine multiple indices at once. This enables the comparison between buckets from different stocks that mainly contain positive news.

Therefore, the lack of negative news does not affect the labelling validation process of informative tweets.

Further Work

Identification of the optimal index for the labels, investigation of optimal lags and hypothesis assessment.