

Overreaction to News: Empirical Analysis of Intraday Stock
Market Mispricings Using Twitter

Bachelorarbeit

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List of abbreviations

CAR	Cumulative Abnormal Return
EMH	Efficiency Market Hypothesis
FEARS	Financial and Economic Revealed by Search
GPOMS	Google-Profile of Mood States
NYSE	New York Stock Exchange
OHLC	Open-High-Low-Close
POS	Part-Of-Speech
SOFNN	Self-Organizing Fuzzy Neural Network
SVI	Search Volume Index

Abstract

Stock market movements and the price fluctuations of shares are one of the most popular topics of financial researchers. Most of the existing literature neglects the impact of social media on financial markets and underestimates the effect platforms like Twitter have.

In this thesis I will present a theory using news-related twitter posts to represent the fundamental value of stocks and increase the predictability of the intraday stock price movements afterwards. The over- and underreaction in prices based on good or bad news should vanish over time and revert to the fundamental value. These return reversals are illustrated in an explorative analysis. Further implications concluding this eventstudy.

The study tries to anticipate price movements by using the first Twitter post as a reference point and examines the deviations from the Efficient Markets Hypothesis with the help of the return distribution.

Keywords

Investor Sentiment Analysis, News Impact on Stock Markets, Twitter, Over-/Underreaction, Efficiency Market Hypothesis, Event Study

1. Introduction

For investors at the stock market most likely the question appears, which stock one should buy or sell and which source of information should be selected to increase the return on the specific investment. To generate information for this buy or sell process, investors look at earnings announcements, quarterly results or other company related news. Fourty years ago all the trading based on classic financial news literature like magazines, written analyses or newspaper articles. In the recent past the trading has developed in enormous dimensions. Social media platforms like Twitter, Facebook & Co have grown to connect people among the whole world, sharing ideas and commentaries between each other. The dramatic increase in user acceptance is shown in Figure 1 below, where the daily number of tweets are displayed. In October 2013, about 500 millions of Twitter postings were made and were constantly rising further.

The amount of data generated in those social media platforms is tremendous.

A vast number of researchers studied the correlation between social media platforms like Twitter and the stock markets around the world.

This bachelor thesis aims to analyse the correlation between Twitter posts and company related events occuring at the stock market. By using an event study approach we try to visualize our hypothesis and get more detailed information about stock market movements and possible intraday chart anomalies. To test the Efficient Markets Hypothesis we implement the fundamental value, being the first tweet relating to the identified event. To identify such events we observe stock price pattern on a 15 minute interval with a code utilized in the statistic programme R.

The structure of the thesis is as follows: The first part deals with the literature concerning social media, news influence on stock market movements, market anomalies, Efficient Markets Hypothesis and the approach of the event study.

Chapter 3 describes the data and the methodology. Here our research hypothesis as well as our research questions are presented. Chapter 4 shows the own empirical analysis. Therefore the identified events are illustrated in an explorative analysis followed by the return distribution. Part 5 refers to the discussion of the empirical analysis. Chapter 6 includes the limitations of our approach and possible improvements for future research.

In part 7 our empirical results are concluded.

The references and the appendix conclude this work.

7. Conclusion

The recent literature concerning the Efficient Markets Hypothesis and short-term market anomalies reveals more and more deviations between actual stock price and true value, especially in the short-run.

Nonetheless the EMH is still valid and a widely accepted approach in the field of economic researchers.

Our investigation aims to determine the fundamental value of a stock with the help of related Twitter postings and illustrate intraday stock market movements such as overreaction, underreaction, return reversals or different types of trends.

The fourth part of our thesis showed that the event study methodology is an ideal tool to analyze intraday stock market movements. The case Adidas and the result, the graphically determination of the fundamental value, and the following stock market overreaction as well as the following return reversal close to the fundamental value supports our hypothesis that social media content can influence financial decision making. The provided news published on Twitter is incorporated into stock prices relatively quickly and underlines the fast adoption of news content by investors.

The discovered overreaction in Adidas shares are in line with behavioral finance researchers stating the noise trader risk as well as psychological forces driving equity prices.

The intraday return results support the fact that in future research a possible trading strategy can be implemented to obtain abnormal returns. Therefore transactions costs have to be considered which we completely ignored in our analysis.

Dimpfl choose the close-to-open return approach to identify events. Maybe this approach can be adjusted for our intraday analysis to calculate the intraday return between a given period of time.

So there are a few approaches where we can built on and improve the methodology of our hypothesis so that better and more robust results can be presented in future.

Concluding in accordance to Fama and French:

"Whether predictability reflects market inefficiency or time-varying expected returns generated by rational investor behavior is, and will remain, an open issue."⁸⁸

⁸⁸ Fama/French (1986), p.24