

Web Media and Stock Markets a Survey and Future Directions from a Big Data Perspective

Yogita Kumari¹, Usha M²

¹Dept. of MCA, Bangalore Institute of Technology, Bengaluru, India.

²Dept. of MCA, Assistant Professor, Bangalore Institute of Technology, Bengaluru, India.

Abstract: Disclosure, dissemination, and public acceptance all affect stock market volatility. The effect of digital information on the stock market is becoming more and more obvious as social media usage and speed increase. However, because it is challenging to automatically gather and analyse vast volumes of relevant data. There is a dearth of both sheer scope in the studies on how digital media affects the stock market. To evaluate how the stock market and online media are related, the study thoroughly reviewed 229 research publications from the domains of finance, business informatics, and computer science. By media type, we have intentionally grouped representative works and distilled the key methods for transforming text data into a machine-friendly format. The models that were employed to uncover the covert connection between web media and stock movements were compared in the end. Our objective is to clarify the direction by using the most recent, cutting-edge research to understand the mechanism of web information penetration and its impact on the stock marketplace of investor cognitive behaviour, financial reporting, and stock exchange regulation.

INTRODUCTION

In traditional finance, the efficient market is that holds stock prices are consistently determined by "genuine" investors and are aligned with the company's fair current value of projected future cash flows. Stockholders are frequently disagreeing on this matter but are continually changing how they feel about how well equities might perform in the market. Inconsistencies between real prices and actual value are caused by these differences between competing market participants, that causes stock amount range to vary around real value and complicates asset values. This project mainly tells that the web has developed from a technology information that sharing to a facilitator of social contact between users as a result of technological advancements. For example, social news, blogs, tweet, and microblogs have all developed from traditional news to various forms of social media. Thanks to a wide-ranging communication gateway. Investors have rapid access to more worthwhile and timely data.

The influence on the stock market has grown dramatically as a result of the exponential growth and widespread adoption of web media. It is quite difficult to comprehend how web information leaks work and how they affect the financial markets. As a result of analyzing stock price swings using news feeds, researchers are paying attention to the stock market media. Early research largely focused on linear model or empirical investigations of outliers, which reduced the influence of the media on the quantity of news pieces rather than textual content. Natural language processing (NLP) and artificial intelligence (AI) technical advancements have been employed by scientists to bridge these contacts and comprehend how the media affects stock prices.

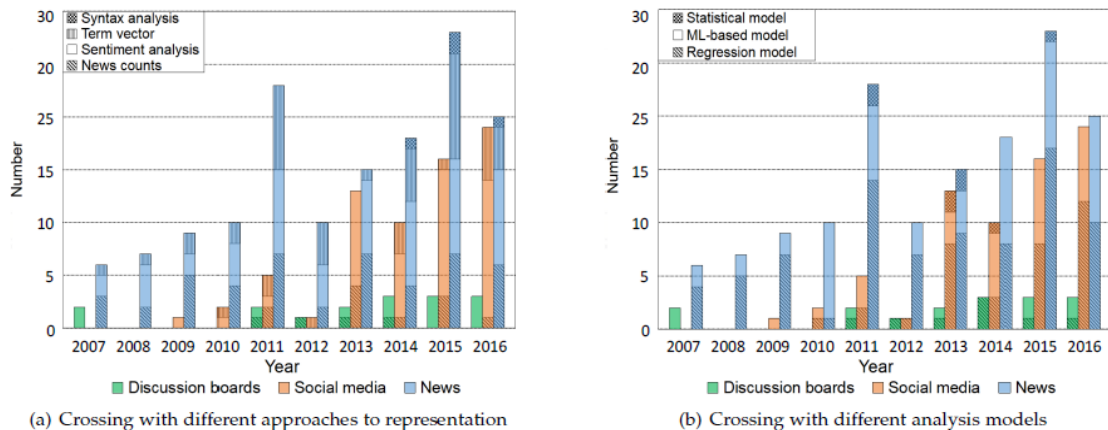
Web media content

A media-savvy stock movement investigation was started using financial reporting and news pieces. New media, including blogs, tweets, and social media news, have become increasingly necessary in affecting the stock market since the introduction of Web 2.0. According to a pilot research, mood in tweets affected stock trends shortly after they were posted. It enables for every individual to express their ideas and emotions on social media.

LITERATURE SURVEY

Media-based motion analysis framework

Some user interactions successfully promote knowledge sharing behaviour and its value. The opinions of other investors might have an impact on an investor's decision in the social media age and cause herd investing. Such technological advances have prompted the use of big data in quantitative study on resource and fluctuation changes that are media-conscious. Determining whether news will have an impact on the stock market and which is the most well-liked research issue in the current field. In order to solve this problem, researchers compared the effects of media and non-media sources as well as the distinctions between good and not relevant news. We also considered how certain news stories affected particular businesses.



Representation in the media

As new information about economic and company fundamentals becomes accessible, as well as stock prices so many "reasonable" investors are said to continuously update their ideas about the market's direction. The following techniques can be used to transform text data into a machine-readable format for additional media to stock research. This is known as the efficient market hypothesis in classical finance. So it's critical to pull useful data from text-based online data that represents macroeconomics, fundamentals, and stock performance.

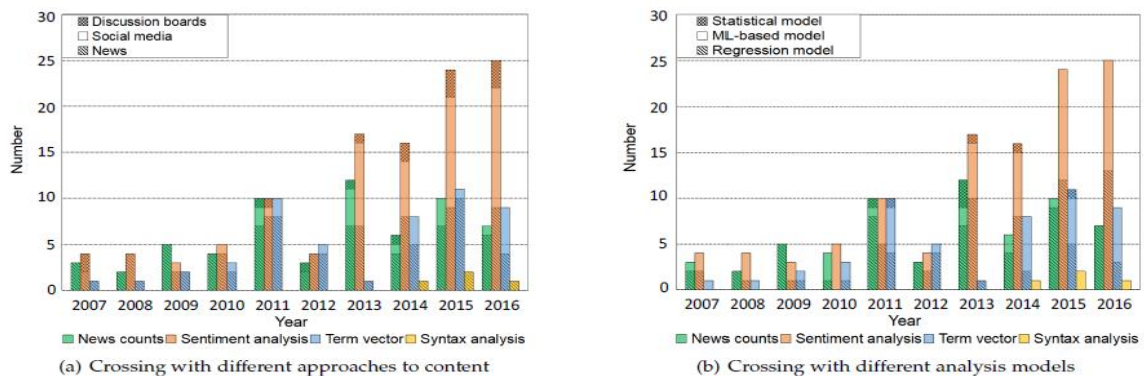


Fig. 4: Methods for representing textual information.

Over the past few decades, some research has been done on how the media affects the stock market. The effect of media and stock prices is intensifying the rise in popularity of digital-media, particularly the vanity press of social media and the spread of the Internet. Additionally, by enhancing artificial intelligence technology's capabilities, particularly its capacity to quickly analyse many terabytes of web data, it is possible to extract more accurate and important information from internet and comprehend undiscovered relationships among web media and now it's feasible increased sensitivity and accuracy in the supply chain. Media-savvy huge funds like Derwent Capital, DCM Capital, and Cayman Atlantic have been made possible by technological advancements.

Syntax analysis: Words and syntax together determine a paragraph's meaning in natural language. The bag-of-words model's drawback is the destruction of word structures' connections. The scope of these models is so constrained. As an illustration, if the phrase "Samsung phone smokes on Indian airlines" is presented as a series of words, the unstructured term does not reflect an actor ("Samsung"), so Samsung corporation and India may exert pressure on both airlines. You can determine the location from there ("Indian airlines"). Because of this, few researchers taken things a step further and presented articles with proper structure view of events (for instance, Actor = Samsung phone, Action = emit, Object = smoke, Place = Indian airline), where information extraction (IE) techniques were used to assign the role of each word. For Example, to improve structured representations of events and forecast stock volatility, a knowledge graph was utilized.

Model of Analysis

Artificial neural network research has made significant advancements recently in a number of fields, including speech recognition, machine translation, and object recognition in machine vision. There are two effective approaches for examining media-savvy stock movements. One is the feed-forward neural network with only one layer known as the ELM. The best output weights are analytically determined by randomly choosing them rather than matching the input to the hidden layer bias. Problems like local minima and parameters are avoided. With learning rates up to thousands of times faster than conventional techniques, ELM offers generalization performance that is similar to (for regression and binary classes) or significantly better than (for multiclass classes).

This deep learning structure enables computational models with multiple processing layers to learn data representations. With several layers of abstraction, CNNs have the benefit of being easier to train and having a far smaller number of parameters than fully linked networks with hidden units of the same size and examining how deep learning might be used in the financial industry and the markets are interesting to see. Additionally, recent knowledge we have demonstrated the benefits of tensor-based media vector-based techniques over representations. It is important to look into the possibilities for media-aware stock movements of tensor-based deep neural networks.

Mechanism of Influence

The majority of previous research has been on the immediate effects of Web media on a particular firm. Instead of being restricted to a single company, media influence extends to a number of connected businesses. What impact does news that impacts the trend of a relevant company have on connected companies, in particular? What effect will simultaneous changes in information have on a specific company's related enterprises in the media? Such media will be knowing the flow effects and combination impacts have never been properly studied due to technical limitations. Understanding how internet media affects co-movements of pertinent companies is crucial.

Previous studies have shown that, as contrast to generic stock co-movement, stock platform related to a company's underlying value, investor preferences, and inadequate information.

CONCLUSION

Since the dawn of time, information has been transmitted via smoke. Financial markets are constantly affected and rebuilt by signals, the telegraph era, information, and the Internet era as a crucial market and price determinant. We did a systematic review of 229 studies on media awareness for this study. Stock movement data was made public between 2007 and 2016 in the field of finance, management information systems, and computer science.

We have made an effort to conduct quantitative analysis in order to fully comprehend the thinking processes of investors from a variety of angles, such as the means by which financial and management information systems and information spread over the Internet and their effects on the stock market business management that resembles exchange regulations. All effects of various research projects from various disciplines to determine the stock market's exposure to web information. After that, we intended to identify a framework for future improvement by segmenting this major difficulty into three main themes: media content, media presentations, and analytical models. Finally, we wanted to offer relevant recommendations for further research based on our findings.

FUTURE ENHACEMENT

In this paper, we suggest a fresh framework for evaluating land. Particularly, the framework could consider both spatial and aesthetic features. It's suggested model's suitability or flexibility and recommended by the evaluation of a model's performance in two selected urban regions. Undoubtedly, our research has also provided new approaches for using sophisticated neural networks on material structured in charts. We are confident that our method can impart some understanding on site assessment while also inspiring others to use sophisticated machine learning on material structured according to charts.

ACKNOWLEDGEMENTS

Dr. Qing Li received funding from the National Natural Science Foundation of China (NSFC) (71671141,71401139, 60803106, 61170133), the Fundamental Research Funds for Central Universities (JBK 171113,JBK 170505,JBK151128,JBK120505), and the Sichuan Region Education Department's Lab of Online NLP. It was also partially funded by grants from the National Science Foundation to Dr. Hsinchun Chen at the University of Arizona (ACI-1443019, DUE-1303362, CMMI-1442116, SES-1314631) and the China National 1000-Talent Program at Tsinghua University.

**REFERENCES**

- [1] E. F. Fama, "The behavior of stock-market prices," J. Bus., vol. 38, no. 1, pp. 34–105, 1965.
- [2] M. Rechenstien and W. N. Street, "Using conditional probability to identify trends in intra-day high-frequency equity pricing," Physica A Stat. Mech. Appl., vol. 392, no. 24, pp. 6169–6188, 2013.
- [3] J. B. D. Long, A. Shleifer, L. H. Summers, and R. J. Waldmann, "Noise trader risk in financial markets," J. Political Econ., vol. 98, no. 4, pp. 703–738, 1990. and UK multinationals," J. Int. Financ. Manag. Account., vol. 6, no. 1, pp. 43–68, 1995.
- [4] W. S. Chan, "Stock price reaction to news and no-news: Drift and reversal after headlines," J. Financ. Econ., vol. 70, no. 2, pp. 223–260, 2003.
- [5] Q. Li, T. Wang, P. Li, L. Liu, Q. Gong, and Y. Chen, "The effect of news and public mood on stock movements," Inf. Sci., vol. 278, pp. 826–840, 2014.
- [6] X. Luo, J. Zhang, and W. Duan, "Social media and firm equity value," Inf. Syst. Res., vol. 24, no. 1, pp. 146–163, 2013.