



Has microblogging changed stock market behavior? Evidence from China



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HIGHLIGHTS

- The Microblogging has changed the information environment in China.
- The Microblogging has changed the stock market behavior in China.
- The relative trading volume is increased in the post-Sina Weibo period.
- The expected return is decreased in the post-Sina Weibo period.
- The firm-level volatility is decreased in the post-Sina Weibo period.

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ABSTRACT

This paper examines the stock market behavior for a long-lived subset of firms in Shanghai and Shenzhen CSI 300 Index (CSI 300 Index) both before and after the establishment of firms' Microblogging in Sina Weibo. The empirical results show a significant increase in the relative trading volume as well as the decreases in the daily expected stock return and firm-level volatility in the post-Sina Weibo period. These findings suggest that Sina Weibo as an alternative information interaction channel has changed the information environment for individual stock, enhanced the speed of information diffusion and therefore changed the overall stock market behavior.

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1. Introduction

The emergency of the Internet has profoundly changed the process of information gathering, processing and diffusion in financial market. Not only have the Internet made it easier to obtain interactive data and more amplified microcosmic dataset for financial research, but also have created new channels for information interaction. The changed information environment is characteristic of the information network between investors becoming more complex, the information sources and information content tuning into diversification. Therefore, it is an empirical question to ask whether the changed information environment has some material impact on the overall stock market performance. What is more, in June 2013,

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the China Securities Regulatory Commission (CSRC) announced that they would monitor the information appeared on social media and the insiders of the listed firms are not allowed to release news on social media communication tools. This fact further confirms the conjecture that the Internet information is likely to influence the stock market behavior in China. Consequently, this paper aims to answer the raised question by focusing on the Chinese stock market.

Recently, scholars began to explore the relationships between Internet information and stock price behavior. There are mainly two schools of thought regarding the utilization of Internet information. The first centres on the predictability, with both the volume [1–5] and the quantified content [6–11] of the Internet information. Wysocki (1999) [1] firstly found that the variation in message board postings is associated with the trading volume and the stock return. Antweiler and Frank (2004) [6] used the computational linguistics methods to extract the sentiment from the stock message boards finding that stock messages help predict market volatility. Curme et al. (2014) [11] introduced a method to mine the Internet data (Google, Wikipedia and Amazon Mechanical Turk) to identify the relationship between the interest changes in online information-gathering behavior and the subsequent stock market behavior. The rationales behind all these studies are united together by the challenge of the efficient market hypothesis, which also shifted the attention from employing more sophisticated prediction models to exploring more useful information. The second series of research try to complement or validate some untested theories in finance market. Da et al. (2011) [12] used the search frequency of stock names in Google Trends as the direct proxy for investor attention and explained the long-run underperformance of IPO stocks with the investor attention theory; Zhang et al. (2014) [13] showed that the information obtained from Baidu News could be viewed as the proxy for Internet information arrival illustrating the volatility clustering with the theory of Mixture Distribution Hypothesis. These studies do not, however, investigate the impact of the Internet information on the overall stock market behavior.

To the best of our knowledge, Jones (2006) [14] is the only work that investigates the changes in stock market behavior between the pre and post messages board on Yahoo! Finance. This paper builds on the work of Jones (2006) [14] but differs in several ways. First of all, compared to the existing evidences in developed countries, we give first evidence in emerging market that Sina Weibo as an alternative form of information diffusion channel can affect the stock market behavior by establishing the information interaction for investors in China. Secondly, Sina Weibo is different from the message boards due to the posting and forwarding behaviors of the users. This feature allows information to reach investor who would be the potential investor of certain stocks. Up to now, no studies try to link the relationship between Sina Weibo and the stock market behavior. We complement the literature with this new kind of Internet information. Thirdly, other than roughly omit the bubble period in the analysis of Jones (2006) [14], we calculate the relative trading volume compared to the CSI 300 Index. This allows us to observe the changes in a more meticulous way. Fourthly, we use both the 225 pre/post trading days and 450 pre/post trading days' windows to test our hypothesis. These two windows cross-validate that our empirical results are not driven by investor's short-term irrational behavior.

This paper is organized as follows. Section 2 illustrates the theoretical hypotheses. Section 3 describes the dataset. Section 4 is the empirical finding for the proposed hypotheses. Concluding remarks are briefly indicated in Section 5.

2. Hypotheses

According to Zhang and Pentina (2012) [15], Sina Weibo allows users to broadcast short messages via multiple platforms to friends and followers, ensuring frequent and immediate updates on their opinions. Therefore, these connected investors will be tempted to revise their previous belief and the trading volume should be increase. As is admitted that, Chinese stock market undergoes a bear period from 2010 to 2013. In order to avoid spurious results that trading volume increases in the post Sina Weibo period, we calculate the relative trading volume compared to the CSI 300 Index (RTV).

$$H1 \text{ Mean (RTV)}_{\text{pre-Sina Weibo}} < \text{Mean (RTV)}_{\text{post-Sina Weibo}}.$$

In line with Miller (1977) [16], the market price is closely related to divergence of opinion and if the risky stocks become less risky over time, their expected prices should drop. Sina Weibo provides an alternative form of information interaction for investors, which reduce the risk of certain firms. As a consequence, the expected stock price in the post trading days should be lower.

$$H2 \text{ Mean (expected returns)}_{\text{pre-Sina Weibo}} > \text{Mean(expected returns)}_{\text{post-Sina Weibo}}.$$

To test this hypothesis, we adopt the standard CAPM model with the consideration of time value of investment and the compensation for the additional risk. The expected return for individual stock is calculated as:

$$ER(r_{i,t}) = rf_{i,t} + \beta (ER(rm_{i,t}) - rf_{i,t}) \quad (1)$$

where $rf_{i,t}$ is the risk-free rate of return and we adopt the 1 year SHIBOR (Shanghai Interbank Offered Rate); $ER(rm_{i,t})$ is the expected market return and is calculated as the realized returns of CSI 300 Index; β for the subsequent trading day is estimated from the regression model of individual stock return and CSI 300 Index return with the moving windows from –60 trading day to –1 trading day.

The emergence of Microblogging in China may also have changed the risky factors of the stock market. Even if there may exist some noise information in Sina Weibo and thus increase the volatility of the market. In generally, with noise trader,

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