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Internet attention and information asymmetry: Evidence from Qihoo 360 search data on the Chinese stock market

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HIGHLIGHTS

- The effects of investor and media attention on information asymmetry was explored.
- Qihoo 360 search data were used in the Chinese stock market.
- Three information asymmetry measures were applied to examine the effects.
- Investor attention facilitates a significant decrease in information asymmetry.
- The effect of media attention is insignificant in information asymmetry.

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ABSTRACT

Investor and media attention play a significant role in stock markets, and internet attention has been used as a proxy for investor and media attention to explore their influence on fluctuations in stock prices. This study relied on the Qihoo 360 search index to investigate the effects of investor and media attention in the Chinese stock market. We used three major information asymmetry measures to explore whether investor and media attention were relevant for stock market information asymmetry. Our empirical results reveal that investor attention accelerates information dissemination into stock prices and reduces information asymmetry significantly. However, after investor attention and other control variables are controlled for, the effect of media attention is trivial. The results confirm that internet attention facilitates forecasting market performance in the Chinese stock market.

1. Introduction

The information asymmetry effect seriously harms small and medium-size investors, which reduces confidence in the stock market. To reduce information asymmetry, many investors and the media spend a considerable amount of time and effort searching on the internet to find financially relevant information [1], which enhances stock market liquidity and reduces the cost of equity capital. On the one hand, looking for information on the internet can help the investors become more informed about stock markets. This search behavior indicates the investor's attention, and it plays an important role in accelerating the speed of information dissemination from the public to investors and improving market efficiency. On the other hand, market regulatory agencies tend to view regular disclosure of information by firm managers as an important way to maintain an orderly financial market, and related information is usually released and disseminated by electronic media.

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Therefore, these levels of disclosure are also believed to reduce the degree of information asymmetry among investors. The finance literature has documented many discussions about whether investor or media attention have an impact on stock returns and volatility in the market [2–5], which indicates the valuable role of investor and media attention in the stock market.

The previous studies mainly focus on two issues. Some studies explored the impact of investor attention on fluctuations in stock prices. They mostly used abnormal stock returns [6,7], trading volume [8,9], and advertising expense [10] as proxies for investor attention. But these proxies have certain limitations in practice, because they are all passive measures of investor attention. In recent years, the evolution of the internet has reduced the cost of acquiring information and increased the availability of information. Hence online search is a reliable proxy for investor attention. For example, Da et al. [11] and Bijl et al. [12] used Google search volume as a proxy for investor attention to examine the relationship between stock returns and investor attention. Vlastakis and Markellos [13] and Goddard et al. [14] showed that investors' online search behavior was associated with stock volatility. Bank et al. [15] suggested that increased investor attention as reflected by Google search volume resulted in higher trading activity and stock liquidity. The findings in these studies confirm that investor attention plays an important role in stock market activity. Other studies explored the impact of media attention on fluctuations in stock prices due to the availability of information from electronic media. Previous empirical studies mainly investigated scheduled and easily identifiable news events, such as macroeconomic announcements, policy interventions, or earnings announcements. However, at present nonscheduled news spread by the media are booming, which indicate the increasing attention to financial markets caused by the media. Fang and Peress [16] used the amount of news to study the relationship between stock price reactions and news circulated by the media. Groß-Klußmann and Hautsch [17] examined the high-frequency market reactions to intraday media attention. Ho et al. [18] investigated the dynamic relationship between firm-level return volatility and public news sentiment. But few studies discussed the impact of investor and media attention to information asymmetry in both regional and global markets. Gao et al. [19,20] studied information asymmetry between investors and investments, which implied that investor attention to stocks was heterogeneous. Investor attention was proxied by the level of search frequency in terms of search volume (Searching volume index, SVI) in Ding and Hou [21]. They found that the changes in the SVI would significantly improve stock market liquidity and reduce information asymmetry. Sankaraguruswamy et al. [22] studied the relationship between media attention and information asymmetry. The media attention was measured by the frequency of news releases. They found that earlier work focused either on the investor effect or the media effect on information asymmetry. Few studies combined investor attention and media attention to explore this problem.

The Chinese stock market has grown rapidly since its inception in the early 1990s [23] and has received considerable attention because of this growth, particularly over the past decade [24]. Previous studies raise an interesting question: can investor and media attention be used to reduce information asymmetry between uninformed traders and informed traders in the Chinese stock market? We study investor and media attention effects using three classical information asymmetry measures—daily probability of informed trading (PIN) based on the Easley–Kiefer–O'Hara–Paperman (EKOP) model [25], adverse selection cost [26], and Hasbrouck's permanent price impact [27,28]—to find out whether investor and media attention are related to stock market efficiency. The proxy for investor attention is frequency in a keyword search of relevant terms using the Qihoo 360 search engine (https://www.so.com). Because news releases encourage uninformed traders to trade, this proxy measures the frequency of news releases on a listed company using this search engine. This study makes two contributions. First, our paper adds to the emerging literature on the relationship between investor and media attention and information asymmetry in the Chinese stock market, based on data at different frequencies on listed boards, especially at higher frequencies. Second, three classical information asymmetry measures are used to investigate the empirical relationship between informed trading and firm-specific internet attention.

After the introduction section, our study is organized as follows. Section 2 describes the data. Section 3 presents the methodologies used to examine the relationship between internet attention and information asymmetry in the stock market. Section 4 shows our empirical results and analysis. A brief conclusion and limitations are provided in Section 5.

2. Data

Web search engines are an indispensable tool for finding information. Billions of queries are input on search engines daily. Baidu is the dominant search engine in China. Qihoo 360 search is the second-largest search engine market based on the average number of daily search queries and the fastest rising contender to Baidu. Several studies use the Baidu index (http://index.baidu.com) as a proxy for internet attention in the Chinese stock market [29–31]. However, the Baidu index encrypts its search index data, so we could not access them using web crawlers. By contrast, search index data on Qihoo 360 (https://trends.so.com) are not encrypted, so they can be obtained using web crawlers.

Because of the availability of research data, this paper studied the dynamics of investor and media attention, proxied by Qihoo 360 index data, on information asymmetry in the Chinese stock market, searching on the names of listed companies. In our study, "investors" mainly means individual investors. Institutional investors usually have deep knowledge about companies and obtain timely and essential information, so they do not need to rely on search engines to collect information before making investment decisions. However, for individual investors, search engines are an important way to obtain up-to-date information. Search engines are a good way to do this because they also calculate the number of news articles released