Google search intensity and its relationship to the returns and liquidity of Japanese startup stocks

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ABSTRACT

This study investigates the relationship between investor attention and stock price movements in Japan's startup stock exchanges, Mothers and JASDAQ. We find a positive relationship between search intensity and stock returns and between search intensity and liquidity. The positive correlation between search intensity and stock returns/liquidity tends to be larger for startup firms with a high proportion of individual shareholders. Contrary to prior studies that have reported a reversal after an immediate stock price increase, our results show the possibility that an immediate increase in stock returns of startup firms may not be neutralized in the long run.

1. Introduction

The purpose of this study is to investigate the relationship between investor attention and stock price movements in Japan's two representative startup stock exchanges, Mothers and JASDAQ. Traditional asset-pricing models tend to be based on the efficient market hypothesis, according to which market prices reflect all available information (Fama, 1976). In reality though, investors may direct their limited attention towards stocks they are interested in and make their decisions according to the information they have on hand, as attention is a scarce cognitive resource (Kahneman, 1973). This raises doubts regarding the assumptions of the efficient market hypothesis and in turn suggests that investor attention may play a significant role in the determination of stock prices.

Merton (1987) develops the “investor recognition hypothesis,” which states that increasing investor attention indeed leads to an increase in stock prices and liquidity. More recently, Barber and Odean (2008) propose the “price pressure hypothesis,” which states that an increase in investor attention towards a firm leads to a temporary increase in stock prices, as investors buy stocks that they actively pour their attention into. However, this effect triggered by investor attention is only temporary, as a price increase does not necessarily equate to an increase in the value of a firm. In other words, an increase in search frequency should lead to an increase in stock prices with an eventual price reversal.

To test the hypothesis on the relationship between investor attention and stock price movements, earlier empirical studies have used indirect proxies of investor attention, including advertisements (Grullon et al., 2004; Fehle et al., 2005; Lou, 2014), appearances on TV programs (Takeda and Yamazaki, 2006), and media coverage (Fang and Peress, 2009). However, the above studies are limited in that there is no guarantee that investors actually pay attention to such advertisements and news media. To overcome this limitation, recent studies have used Internet searches obtained through Google Trends as a direct measure of investor attention (Da et al., 2011; Joseph et al., 2011; Bank et al., 2011; Vlastakis and Markellos, 2012; Aouadi et al., 2013; Takeda and Wakao, 2014; Ding and
These prior studies are similar in terms of research design. Rather, they use data on large and established companies whose stocks are included in major market indices such as Russell 3000, S & P 500, CAC 40, and Nikkei 225 (Da et al., 2011; Joseph et al., 2011; Aouadi et al., 2013; Takeda and Wakao, 2014; Ding and Hou, 2015). In contrast, we focus on startup markets to investigate the relationship between investor attention and stock price movements. Specifically, we use the stock price data of firms listed on Japan’s two representative startup stock exchanges: Mothers and JASDAQ. The Mothers market is mainly different in that it exclusively includes high growth and emerging stocks while JASDAQ is oriented between the main and Mothers markets. We use Internet search frequencies obtained through Google Trends as a direct measure of investor attention and test the price pressure hypothesis proposed.

In focusing on startup markets, we expect to find different results for the following three reasons. First, startup markets have a higher ratio of individual investors, who tend to have limited access to sophisticated databases and smaller portfolios than institutional investors. According to the TSE, for the year of 2016, the ratio of individual investors was 68.8% (71.5%) for Mothers, 66.3% (75.0%) for JASDAQ, and 16.7% (22.8%) for the First Section of the Tokyo Stock Exchange (TSE) in terms of trading value (volume). This difference indicates that the initial stock price increase caused by Internet searches is likely to be larger for startup markets than for large and established markets.

Second, companies listed on startup markets could have higher future cash flows than those listed on large and established markets. In addition, investors tend to have less information on startup companies than on other companies. These two differences imply that information obtained through Internet searches is more relevant to the fundamental value of a firm, which could lead to increases in the future cash flows of startup companies and thus in larger initial price increases and smaller reversals for these companies than for companies listed on large and established markets.

Third, startup companies are likely to focus more on limited lines of business than large and established companies. As of March 2016, the average number of consolidated subsidiaries is 3.9 for the non-financial firms listed on Mothers, 5.0 for those listed on JASDAQ, and 32.7 for those listed on the First Section of the TSE. In addition, a couple of large Japanese companies own one baseball team, which is frequently searched for on the Internet (Takeda and Wakao, 2014). Such limited lines of business are likely to reduce noise in search results for startup companies, resulting in the generation of more precise empirical results on the relationship between investor attention and stock price movements.

Our contribution to the existing literature is three-fold. First, to our knowledge our study is the first to use data on startup markets to show that the price pressure hypothesis holds more clearly for startup markets than for large and established markets. Second, unlike large and established markets examined in previous studies, we show the possibility that an immediate increase in stock returns of startup firms may not be neutralized in the long run. This difference suggests that information obtained through Internet search activities is likely to be relevant to an increase in the future value for startup companies, which tend to maintain poorer information environments than large and established companies. Third, we also provide evidence that the positive relationship between search intensity and stock return/trading volume is larger among firms with a higher proportion of individual investors.

The remainder of the paper is organized as follows. Section 2 provides background information including a literature review and information on the Japanese context. Section 3 develops the hypotheses proposed. Sections 4 and 5 explain the data selection approach and methodologies used, respectively. Section 6 discusses the empirical results. Section 7 provides robustness checks. Concluding remarks are provided in Section 8.

2. Background information

2.1. Literature review

Both the “investor recognition hypothesis” developed by Merton (1973) and the “price pressure hypothesis” proposed by Barber and Odean (2008) state that increasing investor attention indeed leads to an increase in stock prices and liquidity. Barber and Odean (2008) claim that in the real world, individual investors face a search problem when buying stocks, as there are thousands of stocks to choose from with only a limited amount of time and attention. Thus, investors only actively search for and buy stocks that capture their attention, resulting in price increases for companies that capture investor attention. In contrast, individual investors do not encounter the same search problems when selling stocks that they already own and know about. Unlike individual investors, institutional investors may not encounter such asymmetric behaviors between buying and selling stocks, as they have more time and advanced technological tools than individual investors when buying stocks. In addition, institutional investors sell short more frequently than individual investors and thus must carry out intensive searches when buying and selling stocks.

Many studies have investigated the relationship between attention and stock price movements. Earlier studies have used indirect proxies of investor attention, including advertisements (Grullon et al., 2004; Fehle et al., 2005; Lou, 2014), TV program appearances (Takeda and Yamazaki, 2006), and media coverage (Fang and Peress, 2009). However, the above studies are limited in that there is no guarantee that investors actually pay attention to such advertisements and news media.

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