Attention effect via internet search intensity in Asia-Pacific stock markets☆

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ABSTRACT

This paper explores relationships between investor attention and various market variables–return, volatility, and trading volume from selected Asia-Pacific equity markets. Unlike most of previous research on attention effects, we directly measure public interest via the Google Search Volume Index (SVI) which allows us to capture retail investor attention in financial markets in a more effective way. Our research is performed at a broad index level, which is a better reflection of retail individual investors' style of investment than a specific single stock. We note, from our analysis, mostly one-way pairwise Granger causality that the change in market variables drives the change in attention. Our results post additional evidence that existence of attention is good for the market overall as it promotes market efficiency. Moreover, we find an asymmetric relationship between various positive and negative market conditions and attention.

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1. Introduction

One of the most controversial issues on the study of the investor attention effect is how to measure attention accurately, given most studies use indirect proxies to measure investor attention. Recently, a few papers adopt the internet search intensity as a new superior direct proxy of investor attention. However, most of them are tested at an individual stock level (see Da et al. (2011); Joseph et al. (2011), and Takeda and Wakao (2014)). We argue that the Google Search Volume Index (SVI) as a recent direct proxy should be tested with a broader level of investment,[1] since investment-purpose internet search users should represent less sophisticated retail investors rather than professional security traders, who possess their own advanced trading platforms. Retail investors are unlikely to search for an individual stock symbol, as they are prone to invest through professional financial intermediaries, such as mutual funds, which basically offer sets of investment choices, including a broad market index

or portfolio. Moreover, less sophisticated retail investors are more constrained with their information processing ability for the detailed information of an individual stock. Therefore, their attentions are best captured at broad investment categories.[2]

It is important to note some potential differences in the level of investor attention between developing and developed countries as follows. First, the investor attention effect might not be the same due to the shareholder base. Ying et al. (2015) show that a relatively low proportion of institutional investors makes the attention behavior in China different from in the U.S. Second, the shareholder rights in each country may be an issue. La Porta et al. (1998) investigate the concentration of ownership and shareholder rights in 49 countries and find that the level of the legal protection is an important factor to explain the form of company's financing and shareholder structure. Assuming that shareholders represent retails investors,[3] we could say that on average shareholder rights in developed markets are higher than in developing markets. Further, enforcement or fairness of the rule of law in developed markets is also better than those in developing markets. As such, retail investors in developed markets are more protected and could potentially be less tentative to information. This implies that the investor attention between developing and developed markets might not be the same. Last, the level of financial education in each country is different. The Mastercard financial literacy index provides the financial literacy score in Asia-Pacific countries by conducting survey research periodically.[4] It appears that on average, the developing countries have less financial knowledge than in the developed markets, albeit seeming to be better over time. As the respondents age between 18- and 64-year old, we assume that the majority of them is retail investors. Thus, the difference in financial knowledge in each country may cause the difference in investor attention.

According to the efficient market hypothesis, price should instantaneously reflect all available information. However, information is ample with today's advance technology, it is therefore hard for investors to allocate their attention to all available information. Investors have to be selective in allocating their attention to price sensitive information. In other words, investors consider only assets grabbing their interests and ignore unattractive ones. Thus, attention is limited. However, attention might serve investors' utility well (Barber and Odean, 2008 and Dellavigna and Pollet, 2009). As such the prices of securities to which more investors allocate attention tend to reflect all available information and being consistent with market efficiency (Vozlyublennaia, 2014). Thus, given the salient attributes of attention in asset pricing, we focus on the attention effect on the aggregate stock index level through three market variables: return, volatility, and trading volume. The attention effects in our study imply that returns on the index with high level of attention should not be predictable (Vozlyublennaia, 2014), volatility of stock index with a high level of attention is low, and finally stock index with high level of attention has the highest trading volume.[5]

Previous literature inspires us about the important role of attention in stock markets. Researchers generally study attention effect on the stock market through market variables. Risk and return are the most popular ones. Return (Da et al. (2011); Joseph et al. (2011); Vozlyublennaia (2014), and Takeda and Wakao (2014)) and its volatility (Vozlyublennaia (2014)) are concluded to a hold significant relationship with attention. Additionally, Blume et al. (1994) show that trading volume conveys some information that cannot be deducted from price statistics (return and volatility), and it is, moreover, shown to be related to information precision and price movements. Joseph et al. (2011) and Takeda and Wakao (2014) also document the significant relationship between volume and attention. Little is known about the attention effect on volatility and trading volume, hence this paper fills this gap in literature by focusing on the attention effect through three major market variables – return, volatility, and trading volume.

Given an opportunity to access the database of interest at no cost, we are able to empirically study the existence and characteristics of attention effect in our dataset. We consider the investor attention as the frequency of the keyword search via Google Search Volume Index (SVI). The larger the SVI, the higher the investor attention. The Google search probabilities (intention) show that actively expressed investors search for a given keyword, subsequently reflecting the level of investor attention in the market. However, there is no guarantee that search-keyword investors will finally trade on the search asset (Vozlyublennaia (2014)). We further push our examination toward the question whether it is good to have the attention effect in the market efficiency perspective. Specifically, we question the role of investor attention in improving market efficiency. Moreover, we investigate whether the relationship is symmetric or not based on the argument of human nature of risk aversion; people put more weight on a negative situation than a positive one.[6] In sum, we form three research questions as follows. First, do there exist the relationships between investor attention and stock index return, investor attention and stock index volatility, and investor attention and stock market trading volume, respectively? Second, does more investor attention improve market efficiency? Last, do good and bad market conditions symmetrically affect investor attention?

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[2] So far, the only published literature with an index level study was investigated by Vozlyublennaia (2014), who captures pairwise relationships between attention-and-return and attention-and-volatility on major asset classes in the U.S. market.

[3] See Table 5, page 1142 of La Porta et al. (1998).

[4] The index is based on three dimensions, basic money management (50%), financial planning (30%), and investment (20%). As of 14 April 2015.
Source: http://www1.mastercard.com/content/intelligence/en/research/reports/2015/mastercard-financial-literacy-index-report-2014h1.html

[5] A majority of existing studies (for example, Da et al. (2011) and Joseph et al. (2011)) finds that attention is associated with abnormal returns and hence, does not improve market efficiency. This evidence is recently supported by Dimpfl and Jank (2016), who show that the Google SVI helps predict market volatility both in- and out-of -sample. These findings are consistent with those in the limited-to-attention studies, which generally document that investors inaccurately react to the information, leading to abnormal returns (for example, Dellavigna and Pollet (2009) and Hirshleifer et al. (2009)). However, Vozlyublennaia (2014) examines the relationship between the attention effect and return and finds that the Google SVI makes market become more efficient. None of existing studies finds that the Google SVI can improve efficiency in terms of trading volume and volatility. Due to mixed evidence and increasing importance of the studies on the investor behaviors, it is essential to thoroughly understand the role of investor attention and effectively interpret the attention effect.

[6] This occurrence has called for attention to researchers. One of the most interesting issues is the risk-return relationship. The negative asymmetric return-volatility relationship in stock markets are widely studied, though the theory suggests the positive relationship. See, for examples, Hibbert et al. (2008), Badshah (2010), and Padungsaksawasdi and Daigler (2014).