Full length article

Stock return and volatility reactions to information demand and supply

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ABSTRACT

The objective of this paper is to evaluate the impact of information demand and supply on stock market return and volatility. In this study we employ a proxy for information demand which is derived from weekly internet search volume. The latest is drawn from Google Trends database, for 25 of the largest stocks traded on CAC40 index, between April 2007 and March 2014. We use news headlines as a proxy for information supply. Our empirical findings suggest: First public information has an impact on stock returns but its impact on the volatility is much more important. Second, the influence of specific information demand to the company persists even by adding market information demand and firm/market information supply. Finally, by applying MCA to results found, it could be concluded that the impact of public information on stock return and volatility is conditioned by two elements: The company and market news disclosure, and the second element relates to the characteristics of the market participants, more precisely their news interpretations and their risk aversion.

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1. Introduction

Recently, the democratization of the Internet has allowed potential investors free access to information. More particularly, firm and market information demand and supply can now be drawn from the recently released Google trend database. Consequently it allows us to evaluate the link between stock market activity and information demand and supply. We know that a voluminous studies tended to evaluate the interactions between them. However, the difficulties to quantify information flow have led some authors, like Kihlstrom (1974), Grossman and Stiglitz (1980), Radner and Stiglitz, (1984), Allen (1990), to show the importance of demand for information as a news proxy. In this paper, we use the new and direct proxy of investor demand for information using the internet search volumes.

We exploit this proxy based on search frequency in Google for two reasons: First, the internet has made a revolution in the financial sector (Barber and Odean, 2001; Antweiler and Frank, 2004; Rubin and Rubin, 2010). Second, Google information-collecting process is regular and credible. Indeed, from February 2009, Google accounted 70% of all search queries in the world and nine out of ten French people use Google, so search volume reported by Google represents the Internet search behavior of almost the general population.

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Our empirical application focuses on 25 stocks composing CAC 40 and the French stock market index CAC40, for the period from April 2007 to March 2014. Our empirical findings have suggested: First, public information has an impact on stock returns but its impact on the volatility is much more important. Second, for the majority of shares, information supply reduced the volatility but information demand has two effects on volatility (increase and decrease). Third, the influence of firm information demand persists even by adding market information demand and firm/market information supply. Finally, by applying MCA to results found, it could be concluded that the impact of public information on stock return and volatility is conditioned by two elements: The first is the release of company and market news, the second element relates to the characteristics of the market participants, more precisely their news interpretations and their risk aversion.

This paper proceeds as follows. The section tow discusses the relevant literature and outlines the theoretical and empirical background. In the third section, we present the datasets and our empirical findings. The final section concludes the paper.

2. Theoretical and empirical overview

2.1. Survey of theoretical and empirical literature

After the famous work of Fama et al. (1969) "The Adjustment of Stock Prices to New Information" in which they found a relationship between return, volatility, trading volume and the rate of information arrival in the market. The link between information flow and financial markets is well known from the so-called "Mixture of Distributions Hypothesis" (Clark 1973) .The MDH provides an explanation for the association between volatility and trading volume by requiring a joint dependence on both the volume and performance on a hidden information process. Kihlstrom (1974) showed the importance of information demand. Grossman and Stiglitz (1980) argued that equilibrium is reached when prices reflect only a piece of the information held by informed investors. So informational efficiency can never be perfect. This theoretical finding is based on the hypothesis that as the percentage of informed investors increases, prices become more informative.

In continuation of this literature, Veldkamp (2006) showed that the inclusion of endogenous information in Grossman and Stiglitz models has an important implication, since information price is a decreasing function of its quantities. Moscarini and Smith (2002) proved that information demand is a decreasing function of information signal. This study showed how well a signal can help to distinguish between different situations. When the information content of a signal is weak, which means that it has uncertainty about the global situation, the demand for information increases and vice versa. Drawing an analogy to the real world, when an event of great importance happens, it creates a situation of ambiguity about its consequences so people ask for more information. When they are satisfied with the quantity of information, investors stop their inquiries and consequently their demands decrease.

Therefore, the demand for information is also based on the importance of new information, as it incorporates the effect of this news on the public. Such information is not directly observable, so the empirical study of its effects on the market needs to use a proxy for the flow of information. Berry and Howe (1994) used the number of new announcements and they found seasonal trends in information arrival. Focusing on the significant difference in information flow in the trading and no trading periods, they put in light the heterogeneous effects on stock market volatility found by French and Roll (1986).

Mitchel and Mulherin (1994) used the macroeconomic and firm specific announcements. They found a statistic significant relationship between information and trading volume but low significance with volatility.

We also note that a significant distinction was made between market and companies specific information. Thompson et al. (1987) have shown that specific news to company has a significant impact on stock returns. This empirical finding was confirmed by Ryan and Taffler (2004). They indeed showed that firm specific publications have a significant and important effect on securities prices variation and on the trading volume. Bessembinder et al. (1996) assumed that returns volatility of a diversified portfolio and absolute values of firm returns, can be considered as a proxy, respectively for information specific to the market and to the company. They showed that company specific information has a positive effect on market transactions. But they clearly found that the effect is more important on small firms.

2.2. Quantification of information flow

Barber and Odean (2001) showed how technological development and more specifically the internet use have an effect on financial markets. They argued that since market participants use online brokerage firms, they no longer need professional advice by traditional brokers. Since they are not ready to pay for such consulting service, the authors argue that this may lead investors to rely more on Internet to get information for making decisions.

Antweiler and Frank (2004) have highlighted the significant effect of web information on stock returns. In addition, Rubin and Rubin (2013) showed the importance of internet to get company related information. Based on research frequencies on Wikipedia (free online encyclopedia), they showed that the higher the firm information demand is, the lower are the forecast errors made by analysts.

In the light of these data, it is clear that internet has radically changed information distribution and consumption, by making it easily accessible at a very low cost. However, due to the enormous Internet size and depth, getting the right information can be a difficult task. This is the main reason why people rely on web search engines to collect information. However, Hal Varian (2006) argued that "from the research side, Google connects people who seek information to people who provide information. Web without search engines would be like universal library without a catalog card". Therefore, since