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Internet, noise trading and commodity futures prices

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ABSTRACT

This paper relates to internet, noise trading and commodity futures prices. The theoretical framework is the Mixture Distribution Hypothesis (MDH) that posits a joint dependence of return volatility and information. We use two different proxies for the observed component of information flows, which allows to separate the effect of internet searches and information published in newspapers. We analyse the effect of information from the internet using the Internet Search Volume from Google Insight. Empirical results support the MDH and highlight that the search of information on internet by noise traders can amplify volatility.

1. Introduction

This paper relates to internet, noise trading and commodity futures prices. The theoretical and empirical link between World Wide Web and noise trading has already been investigated and verified. Evidences highlight that an easier access to data through internet searches may increase noise trading and drive prices far away from their fundamental values (Barber & Odean, 2001; Da, Engelberg, & Gao, 2011; Guo & Ji, 2013; Veldkamp, 2006; Vlastakis & Markellos, 2012). We test this relationship on corn futures prices.

In the last few years corn futures prices have undergone high levels of price volatility. This development opened a debate on the role of the "financialization" of commodity futures, spot markets and its destabilizing effects on agricultural markets. In fact, although it is well known that derivatives provide economic benefits, such as information dissemination, price discovery and efficient allocation of resources, the tightened cross-market linkages that result from derivative trading also fuel a common public and regulatory perception that derivatives generate or exacerbate volatility in the underlying asset markets, since they represent not only an important tool for managing risk exposure, but also an opportunity for trading and speculation. In particular, the low cost of futures trading may induce excessive speculation which, in turn, may cause commodity prices to vary excessively, with destabilizing effects in the markets (Cooke & Robles, 2009; Irwin & Sanders, 2011; Irwin, Sanders, & Merrin, 2009; Peri, Baldi, & Vandone, 2013; Prakash & Gilbert, 2011; Sanders & Irwin, 2010; Stoll & Whaley, 2010; Tang & Xiong, 2010). Several international

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institutions too have widely explained the negative effects of commodity price volatility on productive activity, food security, poverty malnutrition and political insecurity (FAO et al. 2011; NBER, 2012).

To quantify information flows from internet for corn price dynamics, we use a novel source of information provided by Google; 'Google Insights'[i] (Varian, 2007). Google Insight provides the number of Internet search queries, that is the search volume (Internet Search Volume—ISV) for specific keywords and fields with a weekly frequency and as a value relative to the total number of search on Google in the corresponding time interval.

The theoretical framework of our analysis is the Mixture Distribution Hypothesis (MDH) that posits a joint dependence of return volatility and information (Clark, 1973; Epps & Epps, 1976). Within this framework, using a generalized autoregressive conditional heteroskedasticity model (EGARCH) we analyse corn futures price volatility in order to empirically verify the influences of an increased activity from noise traders to the extent that this follows from easier access to data through internet.

The implications of our analysis are relevant. Traditional theories targeting the relationship between information and prices take into account that internet has changed the production, intermediation, dissemination and consumption of information in the financial industry. Should we expect more noise trading on financial markets? Furthermore, may it affect financial instrument prices and, in turn, impact over the efficient pricing of commodity products?

The article is organized as follows: Section 2 describes the theoretical framework. Section 3 presents the dataset used for the purpose of the study and a brief analysis of variables trend. Section 4 proposes the econometric methodology and section 5 presents the empirical results. Section 6 concludes with a discussion and final remarks.

2. Theoretical framework

According to the Efficient Market Hypothesis (Fama, 1965), a market in which prices always fully reflect available information is efficient. Thus, more information leads to better decision-making and enhances more welfare for both investors and the society as a whole.

Among the underlying assumptions is that investors are rational, and shift in their demand for securities reflect reactions to announcements and news as conveyed through the trading process itself.

However, a voluminous literature in the field of behavioural finance highlights that some investors are not fully rational and their demand for risky assets is affected by their beliefs or sentiments that are not fully justified by fundamental news (among others Tversky & Kahneman, 1974; Kahneman, 2003; Gilovich, Vallone, & Tversky, 1985; Rabin, 2002; Read, Loewenstein, & Rabin, 1999; Forlani, 2002; Lerner, Gonzales, Small, & Fischoff, 2003; Alwathainani, 2012; Corredor, Ferrer, & Santamaria, 2013). Black (1986) argues that such investors irrationally act on noise and call such investors "Noise traders".

In theory, noise trading activity only matters if the judgment biases afflicting investors in processing information tend to be the same; conversely, if all investors trade randomly, their trades cancel out and no aggregate shifts in demand occur. However, empirical studies and experiments in the fields of psychology and behavioural finance find evidence that biases tend to be similar and investors tend to make similar mistakes. Consequently, shifts in the demand for stocks that are not dependent on fundamental factors are likely to affect volatility and prices (Chen & Wu, 2009; Franken, Van Strien, Nijs, & Muris, 2008; Kilborn, 2002; Meier & Sprenger, 2007, Sanders, Irwin, & Leuthold, 2000, 2003).

The recent wide dissemination of the World Wide Web has further accentuated the issue of noise trader sentiment contributing to increase noise trading. Such a link between internet and noise trading has already been studied (Da et al., 2011; Vlastakis & Markellos, 2012). Specifically, Barber and Odean (2008) argue the link between internet and noise trading saying that although internet benefits investors with access to more data, lower costs and more alternatives, it also creates a new environment that may have a dark side: "the truth of the proposition that more information leads to better decision-making is intuitively appealing depends on the relevance of the information to the decision and on how well equipped the decision maker is to use the information". Specifically, the authors argue that the internet has brought changes to investing which may bolster the overconfidence of on-line investors by providing an illusion of knowledge and an illusion of control, as defined by psychologists and accepted in behavioural finance. In other words, the evidence seems to suggest that more information does not always lead to better investment decisions; investors are often not just irrational, but irrational in predictable ways, overreacting to some information and buying and selling in herds. These behaviours may cause noise trading and affect price volatility.

The link between internet and noise trading has also been highlighted by Da et al. (2011) and later by Vlastakis and Markellos (2012). Specifically, Da et al. (2011) use Google search data as a proxy for information used by noise traders to decide their investments. Vlastakis and Markellos (2012) come to the conclusion that internet search reflects only the activity of noise traders and constitutes a source of additional volatility. Bank, Larch, and Peter (2011) too find that the number of search queries on Google particularly measures the interest of uninformed investors.

To study the relationship between internet, noise trading and commodity futures prices we use the theoretical approach of the Mixture Distribution Hypothesis (MDH) (Anderson, 1996; Clark, 1973; Epps & Epps, 1976; Kao & Fung, 2012). This approach posits a joint dependence of return volatility and information. According to theory (Fama, 1965; French & Roll, 1986), measures of market activity – such as prices, return volatility and trading volume – are directly related to the rate of information arrival in the market. From a market microstructure perspective, price movements are caused primarily by the arrival of new information and the process that incorporates this information into market prices. Theory suggests that variables such as the trading volume, the number of transactions, the bid-ask spread, or the market liquidity are related to the return volatility process. Within this theoretical

[i] See www.google.com/insights/search/.