



## Full length article

# Does investor sentiment predict the asset volatility? Evidence from emerging stock market India



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## ABSTRACT

The present study probes the influence of investor sentiment on the predictability of Indian stock market volatility exploiting the non-linear conditional mean–variance framework. We developed a broad based irrational aggregate sentiment index for an emerging market India to examine this issue. We employed ten aggregate market related sentiment proxies to construct sentiment index applicable for emerging stock markets. We used GARCH model and introduced sentiment in the mean framework. To capture the impact of lagged sentiment on stock market volatility and returns spread, we employed VAR-GARCH models. We find significant effect of investor sentiment on the stock market volatility. We also find that past returns and past investor sentiment affect the volatility negatively and positively. The negative investor sentiment influences volatility and supports the proposition that the noise traders' pessimism makes the markets highly volatile. We suggest investor sentiment captures the volatility asymmetry patterns in the returns.

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## 1. Introduction

Behavioural finance, the new paradigm in finance emerged as a response to the modern theory of finance. Departing fundamentally from conventional thinking, the school of behavioural finance proposes certain financial phenomena and patterns of markets which are better explained by the models in which the players participating in the markets are not fully rational (Barberis and Thaler,

2003). In other words, the behavioural theory relaxes the rationality assumption which is corner stone of the propositions of the modern theory of finance. Market participants who trade on irrational components are termed as noise traders (Black, 1986). Noise traders' theory of finance intuitively asserts that markets are informationally inefficient with limits to arbitrage (Shleifer and Summers, 1990) and investors do not make investment decisions based on the market fundamentals and are capable enough to drive the stock prices away from intrinsic values based on their unpredictable beliefs of sentiment. Black (1986) and De Long et al. (1990a,b) among others developed the theoretical framework describing the significant role of sentiment in asset pricing.

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Early papers based on rational expectations hypothesis (REH) argue that noise traders are irrelevant in asset pricing because trades are always made by the rational risk averse arbitrageurs who drive the prices close to the fundamentals at the equilibrium position. (Friedman, 1953; Fama, 1965). Theories in contrast to traditional asset pricing posit that the role of investor sentiment in asset pricing is significant (De Long et al., 1990a,b; Lee et al., 1991; Barberis et al., 1998). Notably, the model of De Long et al. (1990a) emphasizes on the role of noise traders in the equilibrium of assets prices. The model explains that the noise traders acting on the non-fundamental signals can lead to increase in the systematic risk of the assets in the markets which need to be priced. The recent empirical evidence shows that investor sentiment influences the expected stock returns and mean–variance relation of stock returns (e.g. Baker and Wurgler, 2006, 2007, Yu and Yuan, 2011).

The De Long et al (1990a and 1990b) framework of noise trader provides direction to the empirical researchers to testify whether sentiment is relevant in asset pricing. Empirical literature largely focused on the impact of investor sentiment either in mean or in the variance of asset returns. Brown (1999), Lee et al. (2002), Verma and Verma (2007), Kling and Gao (2008) and Yu and Yuan (2011) attempted to substantiate the proposition that investor sentiment creates systematic risk to the assets and this risk is priced into the market. The aforementioned studies empirically analyse the role of sentiment in the formation of conditional volatility and show that both the conditional volatility and excess returns are affected by the investor sentiment. Numerous studies examined the most controversial and elusive trade-off between risk and expected future returns of the assets (e.g. French et al., 1987; Abel, 1988; Backus and Gregory, 1993). Nonetheless, the collective evidence so far is inconclusive. The behavioural aspect of noise traders' information of conditional volatility framework is at best incomplete and not addressed by researchers in the emerging stock markets (ESMs) such as India. Therefore, we shed light on the relevance of sentiment as systematic risk factor priced in non-linear conditional framework in emerging markets like India. Emerging markets always exhibit distinct characteristics compared to developed markets in terms of financial uncertainty, risk return trade-off, volatility, expanding nature of market, introduction of new products etc. In this respect, a proper characterization of the variation of the conditional volatility is important in India for the following reasons. First, the prediction of conditional volatility is relevant for mapping the optimum portfolio strategies in the markets as portfolio diversification decisions are largely triggered by the inter-temporal risk persistence in the markets for different securities and assets. Second, correct forecast of conditional volatility is useful to determine the various other financial products like options. Third, the volatility is the major input in value at risk modelling. Further, if sentiment has significant impact on the variation of conditional volatility, it is likely to witness inaccurate forecast of asset prices and suboptimal portfolio decisions.

Secondly, Indian capital market is largely dominated by the institutional investors as financial markets are not fully

mature and developed like markets in advanced economies where the retail and individual investors dominates the markets. Theoretically, the institutional investors are termed as informed and rational arbitrageurs and trade on fundamentals. Nevertheless, in ESMs such as India where markets are informationally inefficient (Hiremath, 2014) the institutional investors sometimes trade against market fundamentals and act irrationally with the optimism and herding attitude for extra risk premium and excess returns from markets. Therefore, such traders drive the prices against the intrinsic values. The present study is therefore perhaps the first study analysing the role of institutional investor sentiment in stock returns predictability and volatility in India.

In light of the foregone discussion on the motivation and relevance of investor sentiment as a systematic risk factor which is priced into the markets, we examine the role of investor sentiment in the formation of conditional volatility of benchmark market indices of Indian stock market namely BSE Sensex and S&P CNX Nifty. Following the top down approach of Baker and Wurgler (2007), the present study develops an irrational aggregate sentiment index (*Sent*) for India. We construct the sentiment index including aggregate market sentiment indicators related to market performance, types of trading activity, derivative variables, and other sentiment proxies. The market performance variables are the ratio of the number of advances issues to the number of declining issues (ADV/DEC), buy and sell imbalance ratio, dividend premium (Div.P), turnover volatility ratio (Turn.) and trading volume (TV). Further, on the type of trading activity at the monthly level, we consider the percent change in the margin borrowing ( $\Delta$  Margin) as reported by the NSE India. In the third category of variables relating to the derivatives trading activity, we choose the put call ratio (PCR). Finally, in the other sentiment variables, the numbers of first day IPOs number, equity issues in total of debt and equity issues and net purchase of mutual fund flows as a proxy for fund flow are considered. We incorporate the autoregressive nature of sentiment via adding lagged values of sentiment to analyse the role of sentiment in market volatility. To test the impact of sentiment and lagged value of sentiment on volatility and to capture the volatility patterns, we employ the non-linear conditional GARCH class of models and the VAR-GARCH framework.

To foreshadow our key results, we find sentiment as a significant factor in the formation of non-linear conditional volatility. In specific, our results consistently show that investor sentiment is a systematic risk factor and priced into the market. Furthermore, we find that the magnitude of shift in sentiment has a significant impact on conditional volatility asymmetry. Theoretically, it implies that bullish (bearish) fundamental shift in sentiment leads to upward (downward) revisions in the conditional volatility which is further associated with higher (lower) future expected returns and volatility. Our study show that the significance of investor sentiment in India is robust across the indices with its lead and lag values.

In the light of the significance of the dominance of institutional investor sentiment in the ESMs such as India, this study contributes to the literature fourfold. First,

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