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Institutional investment, equity volume and volatility spillover: Causalities and asymmetries

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A R T I C L E   I N F O

A B S T R A C T

We study four-varyingly liberalized emerging markets, precisely, India, Korea, Taiwan and Vietnam, to test causalities and asymmetries of price volume relationship in the conditional second moment. Unlike past literature, equity volume appears as endogenous dynamic information evolving simultaneously with volatility. We extend past researches correlating equity return and volume after splitting into domestic and foreign institutional investor purchases. Uniquely, volatility led impact on volume is much bigger than the volume led impact on volatility. Among other results, we highlight that conditional correlation between volume dispersion and returns dispersion triggers and plays an important role in the stabilization of equity markets.

1. Introduction

Institutional trading and its impact on stock markets has been the focal point of research covering the last few decades with the huge growth of institutional investment in stock market. Naturally the relationship of stock markets and institutional investors' behavior led to a development of literature on whether institutional investors destabilize the stock market? Researchers are divided on the nature of impact institutional investment creates on the stock market. There is a wide body of literature available on how institutional investors influence stock market fluctuation (Lakonishok et al., 1992; Nofsinger and Sias, 1999; Dennis and Strickland, 2002; Dahlquist and Robertsson, 2004; Schuppli and Bohl, 2010) and how the herding behavior can generate excess stock market volatility (Gabaix et al., 2006; Gavriilidis et al., 2013). Previous studies have looked at volume as a potential driver of market microstructure.

Motivated by the same, present study looks from a new angle where volume appears not as an exogenous source of new information but an endogenous piece of information evolving simultaneously with other market information, specifically, market volatility. The present study also brings in another important aspect of institutional ownership – Foreign Equity Investors and Domestic Equity Investors along with their volume of trade. Rather than the conventional approach where the impact of volume on market volatility is tested considering volume at its level value, the present study allows volume to interact in its second moment to market volatility using a unique framework of Markov Switching (Hamilton 1989; Hamilton 1996) Generalized Orthogonal Multivariate GARCH (van der Weide, 2002; Boswijk and van der Weide, 2006) model. The utility of this framework is its ability to capture causality of conditional dispersion of volume changes with that of volatility adjusted by the regimes of high and low, simultaneously in both ways. Such regimes represent phases of

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recession and non-recession and can be called as 'Turmoil' (Bad) and 'Tranquil' (Good) phases (Gębka and Serwa, 2006). Same study finds the existence of an Asian contagion post the financial crisis and hints that the economic channel for such contagion may be portfolio investment or direct investments.

In that sense the present study builds further on the existing studies in the field with a focus on varyingly liberalized emerging economies. The study concludes that there is asymmetric information flow across Foreign Institutional Investors (*henceforth*, FIIs) and Domestic Investors, and across the regimes. Unique finding of this study is volatility having a bigger and stronger impact on volume dispersion as compared to the extent volume dispersion spills to market volatility. Volume dispersion of FIIs is affected much more by market volatility as compared to the volume dispersion of Domestic Institutional Investors (*henceforth*, DOMs).

Going further, Section 2 focuses on literature review. It also gradually builds on this platform and presents our study framework. Section 3 elaborates on the research data from applicable emerging markets and follows it up with presentation and discussion of the empirical results. We summarize our study conclusions in Section 4.

2. Literature review and study framework

Table 1 summarizes the relative contribution of the present study in comparison with past empirical works:

The theoretical framework of Gabaix et al. (2006) attempts to explain how large institutional investors create spikes in returns and volumes through size of the trade. The authors utilize the power law of the trading to explain the tail behavior of returns and volume. The authors' opinion about the need for a more sophisticated technique to assess the price volume dynamics in a situation where information flow can be guided by hidden processes motivates us in many ways following which we bring in a number of arguments.

One such is that the temporal distribution of volume can be non-stationary and non-mean-revertible (see, Appendix A[1]) and thus such an estimation (for example the authors' estimate, $\zeta_q = 3/2$) suffers from unit-root nonstationarity and is spurious. We additionally argue that the authors have not considered stylized facts such as return distribution exhibits volatility clustering, volume changes also exhibit such clustering autoregressive conditional heteroskedasticity (henceforth, ARCH) behavior which, their theoretical framework cannot capture. Such an argument has support from the literature (Campbell et al., 2009), wherein daily institutional trades are observed to occur with high persistence.

Price and volume relationships are found in previous studies to be instrumental in the assessment of their combined impact on stock market volatility. Such a relationship may not be strictly linear as has been observed by Hiemstra and Jones (1994). Specifically the study finds a linear and non-linear Granger causality in the inter-temporal relation of returns and log-transformed values of volume relatives. Our study extends the fact that such a relationship is simultaneous not only in a vector autoregression (henceforth, VAR) specification structure but also where conditional dispersion of V_t is related to σ_t^2 with a Markov Switching structure allowing for both conditional dispersion of V_t and σ_t^2 to interact in a state of high versus low states of regimes. Using a similar type of framework Chen et al. (2001) show that volume contributes some information to the return dynamics although volume does not absorb the ARCH property from return volatility.

Herding and positive feedback trading is found to exist in the stock market. Institutional traders follow their own lagged trade thereby forming a "Herd" (Sias, 2004; Choi and Sias, 2009). Choe et al. (1999) finds extensive herding and positive feedback trading by foreign investors in Korean stock market pre-economic crisis period. However, post-crisis period documents a swift and sharp decline of both herding and positive feedback trading. Few points are worth considering here given the cross-sectional framework of assessing cumulative abnormal return wherein any potential structural change is explicit and somehow arbitrarily defined splitting pre and post-crisis phase as two strata of regimes. We argue further that such identification should rather be endogenous in terms of dating such transition from pre to post-crisis era. Further, information asymmetries may take prominent shape when prices are falling as compared to when prices are increasing giving a distorted distribution of price momentum. Moreover, we argue with empirical support that this buy-sell asymmetry does not limit the interaction path among itself but also cascades an equivalent asymmetry in volume and vice versa. Specifically, post-crisis volume momentum and price momentum is supposed to create a greater degree of mistrust and larger spikes in volume and volatility. Such proposition is already documented by Nelson (1991) in the conditional variance equation and extended further in our framework allowing a simultaneous interaction of volume and returns dispersion across regimes.

Ülkü (2015) reports of extensive negative-feedback trading exercised by foreign investors in respect of local returns in Europe. In terms of assessing amount of impact institutional investors can exercise, event study approaches embedded in a GARCH type of stochastic process may give better insights as compared to approaches with a cross-sectional regression (Bohl and Brzeszczynski, 2006). They also point that institutions reciprocate the creation of autocorrelation and volatility cluster of stock index returns. The framework they use to assess such impact can be described by a Dummy augmented asymmetric GARCH-in-mean model that attempts to incorporate structural changes with an exogenously planted dummy having binary configuration. One important argument for such a strict assumption may create a substantial identification issue of observing regime changes which has been rather attributed as unobserved and shifting interchangeably in the

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[1] We performed augmented Dickey–Fuller test for our empirical data of volume of FIIs and DOMs trade. The high negative number in Appendix A shows that one can accept the hypothesis that there exists a unit root in the level value of FII and DOM volume of trade in our time series sample. We propose to consider logarithm of volume change as simultaneously interacting with logarithm of return change based on unit root non-stationarity in the level value of volume.