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Global markets exposure and price efficiency: An empirical analysis of order flow dynamics of NYSE-listed Indian firms

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ABSTRACT

We examine the effect of global competition for order flows, which arise due to listing of American Depository Receipts (ADRs) by six Indian firms on the NYSE, on the local market. Using order imbalance data for six months pre- and post-listing periods, which captures order flow dynamics, we show that price formation is more efficient in the post-listing period compared to pre-listing period. We also provide additional evidence on the local market quality due to ADRs listing.

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1. Introduction

Temporal imbalance of buy and sell orders in a stock market is commonly termed as order imbalance. In the recent literature there has been a thorough investigation on the role of such imbalance on stock prices in the US market.¹ Existing evidence suggests that there is significant and strong positive serial dependence in the order imbalance data. After controlling for volume, in the short run, order imbalance data can predict stock returns. Thus, order imbalance has gained considerable attention as one of the main determinants of price movements. Order imbalance can reveal concealed information in the gross volume and thus helps to gain our understanding on the relationship between trading activity, volume and price movements. Chordia and Subrahmanyam (2004) point out that the concealed information in volume that can be extracted through order imbalance data mainly comes from

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¹ See Blume et al. (1989), Chordia et al. (2002), Chordia and Subrahmanyam (2004), and Chordia et al. (2005).

two sources: (1) market maker inventory adjustment, and (2) partial adjustment process of private information.

Chordia, Roll, and Subrahmanyam (CRS) (Chordia et al., 2005) relate the effects of order imbalance to overall market efficiency. They empirically show that, in NYSE-listed securities, the order flow dynamics between naïve investors, specialists and arbitrageurs makes NYSE market returns a random walk at a daily interval. They argue that the temporal order imbalances, which are positively correlated, are due to sequential trading and corresponding herding behavior of naïve investors. To reduce these imbalances, which might increase the inventory risk, specialists tilt the prices away from equilibrium levels. This triggers arbitrageurs to offer countervailing strategies and thus bring prices back to the equilibrium levels. Thus, the inventory effect (through specialists) is linked to the information effect (through arbitrageurs) in attaining market efficiency. In this paper we address the same issue when firms are cross-listed in both, competing exchanges and exchanges with different trading mechanism. For this purpose we use Indian firms that are cross-listed in two local exchanges and one global or international exchange, namely, National Stock Exchange (NSE), Bombay Stock Exchange (BSE) and New York Stock Exchange (NYSE).

CRS is set in an exchange with market making facility and thus there is explicit inventory problem. In pure order driven markets like BSE and NSE there is no explicit inventory problem as there is no market making mechanism. Lee et al. (2004) examined order imbalance effects in a periodic call auction market (Taiwan Stock Exchange) and found that large institutional traders act as *de facto* market makers.² This might be due to similar inventory problems, as that of a market maker, faced by institutional investors who generally maintain significant inventory of stocks. They show that, similar to the US market, order imbalance in Taiwan market will not persist for more than a day and market returns follow a random walk within a daily interval. Thus market attains efficiency without explicit market making as discussed in CRS. Hendershott and Seasholes, 2007 also demonstrate the CRS results holds when using changes in NYSE specialist inventories.

However, the degree of persistence of order imbalance is an area of interest, as longer (shorter) duration of order imbalance persistence implies slower (faster) speed of adjustment of information into prices. The extent to which nature of trading mechanism absorbs shocks of order imbalance on a relative basis is still an unexplored area. Cross-listed stocks, in stock exchanges with different trading mechanisms provide an ideal setting to understand the relative efficiency of a given trading mechanism in absorbing the order imbalance shocks. Also cross-listed stocks will provide an opportunity to observe whether competition between exchanges for order flows has any effect on their relative efficiency.

We aim to address the following three important issues relating to the order imbalance and relative market efficiency in a setting where markets compete for order flows:

1. Does local market efficiency improve when markets are fragmented and are open to global competition?
2. Does global order imbalance affect local prices?
3. Does global competition improves local market quality by reduction of spreads?

Although there are several papers that address the effect of cross-listing on relative price discovery process, to our knowledge, ours is the first paper to address this issue in the order imbalance context. With order imbalance data we can improve our understanding on how order flow dynamics influence price discovery, especially when markets are open to global competition.

We find the following evidence by using transactions based intraday data for six months pre- and post-listing of six cross-listed Indian firms: (1) Order imbalance can predict stock returns in both order driven (BSE and NSE) and quote driven (NYSE) trading mechanisms. There is no noticeable difference in the magnitude of the order imbalance influence in different trading mechanisms. However, in an order driven market, the reaction of traders to order flow dynamics vary based on the nature of order imbalance. Particularly in the case of NSE, traders react positively with the increase in the size of

² Limit orders can also be used to affect stock prices.

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