

## Abstract

The world over stock markets use different trading mechanisms. As a result the price formation and price discovery process differs from market to market. For example, the properties of transaction prices from a Walrasian and a continuous mechanism are vastly different. This thesis explores some of the issues raised by the market microstructure literature, in the context of the major changes in the Indian stock markets. The major changes were the shift from an open outcry system to an electronic system on the Stock Exchange, Mumbai (BSE) after the establishment of the National Stock Exchange of India Ltd. (NSE) with an electronic order driven system. We study the efficiency of the market in terms of (i) the transaction cost as measured by the bid-ask spread and (ii) the volatility of prices.

We find that the establishment of the NSE led to major surges in trading volume and a consequent deepening of the stock markets in India. Since about 1300 stocks are cross-listed on these exchanges, we compare the cost of trading, as measured by the bid-ask spread, across these trading systems. We find that the spread is lowest on BSE's BOLT (an electronic quote driven system, BSE On-Line Trading), followed by NSE's NEAT (National Exchange for Automated Trading) and highest on the BSE's open outcry system. The decomposition of estimated spread into its three components shows that the higher spreads on the NEAT system, mainly arise due to the higher adverse selection cost component. A likely explanation for this is the anonymous nature of the trading system. The BOLT is non-anonymous.

We also find that different trading mechanism have a marked effect on stock price volatility. We use an appropriate order ARIMA model to account for the serial correlations. Using the variances of corrected returns, we find that the volatility of prices in the order driven mechanism is not statistically different from the volatility of the prices in the quote driven mechanism. However the volatility of prices at the open is much higher than that at close in the BOLT and NEAT systems. This is because, the BOLT and NEAT use a auction mechanism to arrive at an opening price. But between the NEAT opening and BOLT opening there is no difference in volatility.

Analysing the effect of regulatory policies shows that while banning of short sales did lead to a reduction in volatility, banning badla did not achieve the desired result. The reason for this differential impact may be because while the badla system, involving carry forward charges is costly and used by informed speculators, short sales being costless is used all. Thus short sales are more noisy than 'badla' trades.

We also explore the phenomenon of volatility transmission between the NSE and BSE. At a daily level, we find that though there is transmission of volatility from the BSE to the NSE, the reverse is not true. We also calculate the information share of each market, i.e. the proportion of total Mean Square Error (MSE) of the forecast of returns in the  $j^{\text{th}}$  market that can be attributed to unit innovation in the  $i^{\text{th}}$  market. We find that the information share of both markets is almost same though BSE adjusts faster to innovations on NSE.

Given the above results, we may conclude that market microstructure, which is the sum of the nature of trading mechanisms, order execution rules, regulatory policies, competition between exchanges, etc., has an important role to play in price formation and stock price volatility. It is hence necessary for any regulatory policy to review, analyse and address such issues. It is also possible to arrive at better market design in terms of lower costs and lesser noise in the price discovery process after a careful analysis of the microstructural effects.