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**Topic: Returns and Volatility Relationship Between Futures and Spot Market in India**

### **ABSTRACT**

Relationship between spot and futures markets has been an area of vast empirical investigation in the last few decades. Although considerable attention has been paid to examine the relationship between stock index and stock index futures, only a few studies have examined the relationship between individual stock and stock futures. Besides, most of the previous studies have examined only first moment relationship, that is, lead-lag relationship between a market index and its associated futures contract.

The present study is an attempt to fill this gap to some extent. The study examines first and second moment relationships between spot and futures markets for CNX Nifty and all of its constituent stocks.

More specifically, the study addresses the following questions:

- Do spot and futures markets have a long-run equilibrium relationship? In other words, are spot and futures markets cointegrated?
- Does there exist any lead-lag relationship between spot and futures price changes?
- Does volatility in one market affect volatility in another market?

To answer the abovementioned questions, the study has used 5-min transaction price data from June 1, 2012 to May 31, 2013 and employed a number of tools & techniques of time series econometrics.

The present study is an attempt to characterize the intraday returns and volatility relationships between futures and spot markets in India. It is found that there exists strong long-run relationship between the spot and futures markets at the level of index as well as at the level of individual stocks. Price discovery takes place in both the markets. Further, futures market is found to play a dominant role in the matter of price discovery. These findings are consistent with previous researches in India as well as abroad.

As far as the volatility linkages between futures and spot markets are concerned, the present study has come up with mixed results. Previously in the Indian markets, Karmakar (2009) employed BEKK-GARCH to show that for CNX Nifty volatility of futures market spills over to the spot market and not vice versa. However, he utilized daily data and for uncovering volatility dynamics intraday data are more appropriate. In a similar study, Pati and Rajib (2011) employed 5-min intraday data and found that for CNX Nifty volatility spillovers run in both directions. However, they also reported stronger role of futures market as compared to spot market.

Present study highlights an important characteristic of time series models. For studying volatility dynamics, the study has utilized three different models, viz., Bivariate-GARCH, Bivariate-EGARCH with asymmetry and VAR. In addition, the mechanism of volatility linkages is studied with three sample specifications viz., sample 1 (full sample); sample 2 (sample obtained after removing overnight returns); and sample 3 (sample obtained after removing returns for the first and last 30-minutes). Interestingly, different models yielded different results and even the same model obtained different results for different sample specifications. This implies that generalizing on the basis of a-theoretic time series models should be done with great caution. Moreover, this also underlines the inherent complexity in modeling higher order linkages such as second order linkages i.e., volatility spillovers. Besides, variability in results due to change of model and/or change of sample also points towards unpredictability of financial markets and market efficiency. In conclusion, it can be said that both futures and spot markets serve price discovery function. Spot and futures markets are found to be linked through their first and second moments. It indicates that significant returns and volatility relationship exist between the two markets. These findings may prove to be useful by providing insight on price discovery and have implications for understanding information transmission mechanism and thereby assisting hedgers, arbitrageurs and portfolio managers in executing trading