Abstract

Indian equity and derivative markets grew rapidly after introduction of derivatives in the year 2000 and last decade witnessed major transformations and structural changes in the capital market. Volatility was under control and the markets experienced a boom before Sub-Prime crisis. The crisis, however, increased the volatility to significantly higher levels and destabilised the markets. It is yet to be seen if the crisis succeeded in reducing the beneficial impact of derivative trading reported by previous Indian studies covering the period before the crisis.

The review of literature shows that the studies which consider a period of 1 to 3 years before and after introduction of derivative trading report a decline in volatility but the studies which take a period of a decade around introduction give mixed results. Further, it was found that there is significant lack of long-term studies on this aspect. The impact of expiration day on spot volatility is a related issue and the previous Indian studies have covered a period of only 4-6 years after the introduction of derivative trading. They are unanimous about volume effect but not about return and volatility effect. Market participants are interested in return on their investment and use derivatives to increase their earnings. An important implication of volatility for investors and speculators is its impact on return. Previous Indian studies on relationship between volatility (as proxy for risk) and returns are inconclusive. They report either positive or insignificant results. Further, they do not consider this relationship with respect to derivative trading. Hence, the long-term impact of derivative trading on spot volatility and implications of this volatility for market participants is still an unsettled issue and warrant further study on the subject.

The present study, thus, aims at exploring the long-term impact and implications of derivative trading for spot market. It, particularly, attempts to investigate whether derivative trading enhances volatility and poses a threat to financial market stability. In the process, it also attempts to evaluate the impact of derivative trading and its expiration on spot return & volume and on the inter-play of these
variables i.e., it also explores the volume-return link, volume-volatility link and risk-return relationship with respect to derivative trading. The study then evaluates changes in the structure of volatility during a decade long post-derivative period by dividing it into sub-periods. Further, it also studies the market perception on this subject.

This study uses regression techniques and one symmetric & three asymmetric GARCH models viz., TGARCH, EGARCH, PGARCH to evaluate the impact of derivatives on daily data of spot market index S&P CNX Nifty. The study period extends from January 3, 1995 to June 30, 2011. The period is divided into pre-derivative and post-derivative period based on Chows test. Further, the post-derivative period is divided into sub-periods (2000-04; 2004-08; 2008-11) for detailed analysis of structure of volatility during this time. The study takes US as proxy for world and uses daily data on its S&P500 index to separate its impact from the impact of domestic market. Eviews statistical package has been used to evaluate the models.

The study has also collected primary data to assess the perception of market participants on this subject. For this purpose a questionnaire has been administered to selected members of NSE, BSE and researchers & experts from other regulatory bodies such as SEBI & RBI who have long experience and knowledge of derivative operations. Their opinions have been analysed using SPSS statistical package.

Findings of the study provide strong evidence that derivative trading has contributed to very high volumes. It has altered the structure of conditional volatility and has significantly reduced it. The volatility is asymmetric in nature with the asymmetric effect more pronounced in post-derivative period. This implies that Indian investors need to use dynamic hedging strategies to cover their risk. Although, returns and volatility on expiration day and its next day are high, they do not have a destabilizing effect rather it shows that Indian market is weakly efficient. The expiration effect is mainly due to concentration of volumes in near-month contracts and absence of physical settlement. Efforts should be made to
regulate volumes in near-month contracts and to popularise far-month contracts. Physical settlement should be made mandatory wherever feasible and stock lending and borrowing mechanism should be strengthened. High returns during expiration period indicate that the market mechanisms in India are not well designed to offset surprise imbalances and there is a need to further increase the depth of markets.

The comparison of pre-derivative and post-derivative period reflects an increase in market efficiency in terms of the speed at which new information is incorporated into asset prices and a reduced uncertainty regarding previous news. Positive volume-volatility link indicates that volumes have predictive power in explaining future spot volatility. It also means that investors prefer to take large spot positions in post-derivative period due to increased risk sharing opportunities. Hence, regulators should take necessary steps to curb volatility whenever volumes increase to a higher than normal level. Significant and positive risk-return trade off in all three periods indicates that CAPM is applicable to Indian markets. The trade-off is more significant in post-derivative period which proves that derivative trading has facilitated better compensation of Indian investors on taking higher risk. Based on least values of the measures of Root Mean Square Error, Mean Absolute Error and Mean Absolute Percentage Error, PGARCH (1,1) and PGARCH-M (1,1) models with power=1 are the preferred models for Indian market conditions in all the periods.

The persistence of volatility reduced in post-derivative period but the sub-period analysis shows that persistence increased in moving from first sub-period to third sub-period which is due to influence of Sub-Prime crisis in third period. This implies that the crisis has significantly reduced the beneficial impact of derivative trading that we observed in first and second sub-periods. Respondents of our survey disagree that derivatives caused the Sub-Prime crisis. They think that the crisis was the result of other regulatory and enforcement lapses/failures. Thus, we find no support for argument that derivative trading destabilizes the spot market by increasing volatility.

The study shows that derivative trading does not pose a threat to financial
market stability in India. On the other hand, no persuasive empirical evidence has been found either in favour of an improved fundamental price building process in terms of higher market efficiency and lower persistence of information and volatility shocks during the detailed analysis of post-derivative period. Nevertheless, significant reduction in the mean level of conditional volatility; better risk sharing opportunities; and better prospects of earning high returns; in the post-derivative period gives some support in favour of the stabilizing hypothesis.

The findings strongly point towards the need for strengthening the regulatory environment for promoting the use of derivatives for hedging purposes. A calibrated approach is needed towards launching of new market instruments, especially, derivatives on more sectoral indices, individual stocks and long duration (2 years) derivatives on options while keeping a balance between financial stability issue and market efficiency. It would also be desirable that the role of financial analysts is directed toward investors’ education and creating awareness among them rather than inducing them to make investments. An aware investor will be better equipped to take advantage of positive risk-return relationship in our market. Further, there is an immediate need for putting in place integrated financial derivative markets rather than having separate segmental approach. This will also simplify the working of Clearing Corporation in ascertaining the full financial position of a firm and its customers during a particular period.