Impact of Derivatives on Indian Capital Market – A Literature Review

Mr. Nihar Ranjan Swain[1], Ms. Bhagyashree Padhi[2] and Mr. Aditya Prasad Sahoo[3]

[1]Dept. of MBA, Gandhi Institute for Technology (GIFT), Bhubaneswar

[2]MBA Dept., Gandhi Engineering College, Bhubaneswar

[3]PhD Research Scholar, KIIT School of Management, KIIT University, Bhubaneswar

Publishing Date: April 06, 2017

Abstract

The mercantilism or trading of financial derivatives has received in depth attention. Meanwhile at the same time it has led to a debate over its impact on the underlying stock market from various facets by the academicians. All over the world researchers have done research on derivative trading and were able to find out various facts about derivative and its trading. In this study on account of literature review efforts have been made to bring into the picture the research done about various issues throughout the world by the researchers. The literature review of literature and study is presented in four sections: first, the review of studies fundamental to capital market of India; second, the review of studies elementary to the testing about the capital market efficiency; third, the review of studies concerning the volatility study; lastly, the review of fundamental studies analyzing the causal relation between spot and index futures market.

Keywords: *Trading, Volatility, Capital, Futures, Derivatives.*

1. Introduction

Concerning financial sector reforms there has been a wide range of studies in general, and capital market reforms in particular, since mid-1980s in India. This study considers certain important studies that are context relevant. Several studies comment upon the Indian capital market in general and trading systems in the stock exchanges in particular and suggest that the systems therein are rather antiquated and inefficient, and suffer from major weakness and malpractices. According to most of available studies, significant reforms are required if the stock exchanges are to be geared up to the envisaged growth in the Indian capital market. This review based studies deals with a comprehensive review of literature on financial derivatives. The literature review is one of the vital prerequisites of a proper structured research work. A detail review of the prior researches in the related areas assists in the formulation of research hypotheses and identification of variables related to the hypotheses. The financial derivatives have a short history of three to four decades, notwithstanding they have been extensively subjected to the rigors of research. In India, it has barely been over a decade since trading in financial derivatives, index as well as stock options & futures was introduced. As a result, research on this topic is comparatively lesser.

2. Current scenario of Indian derivative market- An Overview

India's assignation with derivatives began in 2000when both NSE and BSE commenced trading in equity derivatives. Index futures in June 2000 became the first type of derivative to be launched in Indian market, followed by index options in June 2001, options in individual stocks in July 2001, and futures in single stocks derivatives in November 2001. Since then derivatives have come a long way, and the response of Indian investors to this segments is positive. The turnover of derivatives increased from Rs648tn in 2015-16 to Rs2376tn in 2018-2019.During this financial year, the total turnover of futures and options segment of NSE increased by 75% over previous financial year. NSE and BSE launched weekly options on Bank Nifty in 2016 and 2018 respectively. They also launched weekly options in the currency derivatives segment on the USD-INR currency pair and weekly options contracts on Nifty 50 index in 2018.

3. Objective of the study

The purpose of this study is to review the studies dealing with the impact of derivatives on capital markets in India with a view to crystallizing the focus, scope and methodology to be adopted for the present research and to identify gaps which the present study proposes to fill.

The second objective is to conduct a research by following existing literatures on the topic of investigating the relationship between spot and

index futures markets in India with the benchmarks of stock market efficiency and volatility.

5. Research Methodology

There are many approaches and perspectives in the broad field of derivatives research. For the purposes of this article elaboration, we analyzed the contemporary scientific publications and then synthesized the relevant areas, in the historical context. As a supporting method, the progressive summarization was employed, mainly due to phenomena examination. The pertinent information was extracted from the electronic databases resources, as the secondary source of information. This information serves as a base for inductive reasoning and a schema composition which summarizes the findings. The article has a merit of methodological and theoretical layers, especially in the field of finance and economic sciences.

6. Literature Review based study

A. The review of studies fundamental to capital market of India

Shah and Thomas (2003) review the changes which took place on India's equity and debt markets in the decade of the 1990s. This has focused on the importance of crises as a mechanism for obtaining reforms.

Mohan (2004) provides the rationale of financial sector reforms in India, policyreforms in the financial sector, and the outcomes of the financial sector reform processin some detail.

Shirai (2004) examines the impact of financial and capital market reforms oncorporate finance in India. India's financial and capital market reforms since the early1990s have had a positive impact on both the banking sector and capital markets.Nevertheless, the capital markets remain shallow, particularly when it comes todifferentiating high-quality firms from low-quality ones and thus lowering capitalcosts for the former compared with the latter.The paper argues that India should build an infrastructure that will foster sound capital markets and strengthen banks' incentives for better risk management.

Bajpai (2006) concludes that the capital market in India has gone throughvarious stages of liberalization, bringing about fundamental and structural changes inthe market design and operation, resulting in broader investment choices, drasticreduction in transaction costs, and efficiency, transparency and safety as alsoincreased integration with the global markets.

Gurumurthy (2006) arrives at the conclusion that the achievements in thefinancial sector indicate that the financial sector could become competitive without involving unhealthy competition, within the constraints imposed by the macroeconomic policy stance.

Mohan (2007) reviews India's approach to financial sector reforms that set inprocess since early 1990s. Allen, Chakrabarti, and De (2007) concludes that withrecent growth rates among large countries second only to China's, India hasexperienced nothing short of an economic transformation since the liberalization process began in the early 1990s.

Chhaochharia (2008) arrives at the conclusion that India has a more modern financial and banking system than China that allocates capital in a more efficient manner. However, the study is skeptical about who would emerge with the stronger capital market, as both the country is facing challenges regarding their capital markets.

Prasad and Rajan (2008) argues that the time has come to make a moreconcerted push toward the next generation of financial reforms. The study advocatesthat a growing and increasingly complex market-oriented economy and its greaterintegration with global trade and finance will require deeper, more efficient, and wellregulated financial markets.

Srivastava, S., Yadav, S. S., Jain, P. K. (2008), had conducted a survey of brokers in the recently introduced derivatives markets in India to examine the brokers' assessment of market activity and their perception of benefits and costs of derivativetrading. The need for such a study was felt as previous studies relating to the impact of derivatives securities on Indian Stock market do not cover the perception of market participants who form an integral part of the functioning of derivative markets.

B. The review of studies relating to the testing of capital market efficiency

Gupta and Singh (2006) made an attempt to investigate the price discovery efficiency of the Nifty futures by considering lengthy time frame

and their results showed the evidences that futures market has been an efficient price discovery vehicle.

Pastor, Sinha and Swami Nathan (2006) re-examined the inter-temporal risk return trade-off using a novel proxy for expected market return during the period 1981 to 2002 for US and during 1990 to 2002 for other six countries in G-7 group.Using the implied cost of capital, they find strong empirical evidence of a positive relation between the conditional mean and variance of market returns in the G-7 countries, both at the country level and at the world market level.

Dhankar and Kumar (2010) investigated the US stock market returns for presence of conditional heteroscedasticity and the asymmetric effect of good and bad news on volatility. Further, the study also analyzed the relationship between stock returns and conditional volatility, and standard residuals.

Floros and Vougas (2008) examine efficiency of the Greek stock index futures market from 1999 to 2001. The results show that the Greek Futures markets are informationally more efficient than underlying stock markets.

Zhang *et al* (2010) tests the random walk hypothesis and weak form market efficiency in the VIX futures market using a variety of tests. A unit root in the aggregated market price series suggests that the VIX futures market is efficient. For the individual VIX futures price series, 51 of 54 futures contracts meet the sufficient condition for an efficient market: the prices are found to follow a random walk either because there is a unit root or because the increments are not correlated. Overall, the market for VIX futures has been efficient since the first day of trading.

Thus, it is observed that the study of efficiency of the futures market is very important from the point of view of an emerging market like India. But the literature is relatively thin in this direction.

C. The review of studies concerning the volatility study

The volatility of stock futures market has been studied by a number of researchers from different angles. Despite a disagreement of the researchers regarding the kind of influence that the market of derivatives has on the underlying market, most of them agree that it is beneficial even if the volatility is increased or decreased because the derivatives' market acts as a catalyst for the dissemination of information.

Debasish (2009) investigated the effect of introduction of index futures on the volatility and operating efficiency of the underlying Indian stock market. The study considered six measures of volatility, the dynamic linear regression model, and the GARCH models to investigate volatility in National Stock Exchange (NSE) Nifty prices both before and after the onset of futures trading. The effect of the introduction of futures trading was examined during 1997 to 2007. The GARCH analysis confirmed no structural change after the introduction of futures tradingon Nifty, and found that whilst the pre-futures sample was integrated, the post futures sample was stationary. Spot returns volatility is found to be less important in explaining spot returns after the advent of futures trading in NSE Nifty.

Tripathy (2010) analyzed the impact of derivative trading on underlying market using GARCH model during 1999 to 2006. The model included the day of the week effect, domestic market factors, previous days Nifty effect and worldwide market factors. The analysis of information efficiency through a separate GARCH model for pre and post derivatives period showed that there is a shift in market efficiency due to information flow. There is a Friday effect in the market after introduction of derivative products into the Indian capital market.But the findings indicate that the market has become more efficient after introduction of derivative products.

Mallikarjunappa and Afsal (2008) analyzed the impact of the introduction ofderivatives on spot market volatility by applying GARCH model on daily closingprices of S&P CNX Nifty Index during the period 1995 to 2006.The results suggested no impact on volatility.It was finally inferred that any change in the volatility process was not due to the introduction of derivatives, but might be due to many other factors, including better information dissemination and more transparency.

Maniar (2007) analyzed the effect of the introduction of derivatives (futures and options) in the Indian market on the volatility and on the trading volume of the underlying index during

April 2001 to March 2006. To study this effect, he used three models of conditional volatility GARCH, EGARCH and GJR GARCH. He found significant impact on variance: the evidence indicate that the conditional volatility of the underlying index declines after derivative markets are introduced.

Kumar and Mukhopadyay (2007) investigated the impact of the introduction of Index Futures trading on the mean level and volatility of the underlying NSE Nifty Index.The empirical findings suggested that while the introduction of Index Futures trading had no effect on mean level of returns and volatility, it had significantly altered the structure of spot market volatility with faster assimilation of new information into prices and decline in persistence of volatility.

D. The review of fundamental studies analyzing the causal relation between spot and index futures market.

Introduction of derivatives trading has been a significant development in financial markets. Interrelated as it is with the underlying spot market, it raises an interesting issue as to the impact it has on volatility in spot market. It may be noted that the spot and futures market prices are linked by arbitrage, the strategy of taking simultaneous and comparable positions in the two markets by being a buyer in one and seller in the other market. This simultaneous trading has led to the concern among the researchers and the market players over how futures trading impact the volatility in the underlying spot market.

Antoniou et al. (2005),As per the research it was found that, in the present research paper shown the progress of, future index of nifty and Sensex that we hedge the risk by using derivatives. The best technique should be found to control the risk in the capital market of India and in the product market for this it need to be confirmed.

Chan *et al* (1991) estimate the intraday relationship between returns and returnsvolatility in the stock index and stock index futures. The study covers both S&P500and Major Market Index futures. Results indicate a strong inter market dependence inthe volatility of the cash and futures returns. It is also shown that the intradayvolatility patterns that originate either in stock or futures market demonstratepredictability in the other market.

Jegadeesh and Subrahmanyam (1993) compare the spread in NYSE before and after the introduction of futures on S&P 500 index as volatility can also be measured in terms of individual stock bid-ask spread.Overall results suggest that introduction of index futures did not reduce spreads in the spot market, and there is weak evidence that spreads might have increased in the post futures period.

Nath (2003) studied the behavior of stock market volatility after derivatives and arrived at the conclusion that the volatility of the market as measured by benchmark indices like S&P CNX Nifty and S&P CNX Nifty Junior has fallen during the post-derivatives period.

Bandivadekar and Ghosh (2003), and Sah and Omkarnath (2005) also investigated the behaviour of volatility in cash market in futures trading era. They also found that futures trading have led to reduction in volatility in the underlying asset market but they attributed the degree of decline in volatility in the underlying market to the trading volume in futures market.

Mallikarjunappa and Afsal (2007) studied the volatility implications of the introduction of derivatives on the stock market in India using S&P CNX IT index and found that clustering and persistence of volatility in different degrees before and after derivatives and the listing in futures has increased the market volatility.

7. Findings

The mercantilism or trading of financial derivatives has received in depth attention. Meanwhile at the same time it has led to a debate over its impact on the underlying stock market from various facets by the academicians. All over the world researchers have done research on derivative trading and were able to find out various facts about derivative and its trading.

The review of literature provides sufficient evidences that Indian derivatives markethas been an efficient price discovery vehicle. Even in India, the studies foundsignificant causal relationship between derivatives and capital markets. The current study examines specifically the price discovery efficiency of Indian derivatives market. Thus, thecurrent study will be of great benefit for the traders and will help to fill the gap in theliterature.

The impact of financial derivatives have a short history of three to four decades, notwithstanding they have been extensively subjected to the rigors of research. In India, it has barely been over a decade since trading in financial derivatives, index as well as stock options & futures, was introduced. As a result, research on this topic is comparatively lesser.

A detail review of the prior researches in the related areas assists in the formulation of research hypotheses and identification of variables related to the hypotheses. With the help of the present study, the impact of introduction of financial derivatives on the capital market can be studied further which will help the regulatory authorities and investors to take their decisions.

The previous literatures clearly explains that though the pricing formula for futures derives the fair value depending on the spot market prices, the empirical work shows us that futures prices mostly lead the spot prices. However, the literature is very thin in the sense that there exist almost no studies examining the relation between spot and index futures markets in the aftermath of global financial crisis.

8. Conclusion

The Indian capital market has witnessed a major transformation and structural reforms in the wake of liberalization and globalization. The financial sector reforms attracted the academicians, researchers and practitioners to learn more about derivatives and derivatives markets operations and their implications.In addition to these developments, the Indian capital market is being considered to be one of the emerging markets in the world, which has introduced derivative products in line with the other developed counterparts, facilitating risk management to investors. It is inferred that an empirical study concerning the investigation of the efficient market hypothesis, capital market volatility, and lead-lag relationship between stock index and index futures markets is very significant for an evolving market economy like India. In India, the derivatives market is an innovation of the last decade and thus, empirical studies of this kind would certainly unveil important policy implications for the robust growth and development of capital market of the country. Additionally, the extant literature is very thin concerning studies of this kind in the context of India. So, it is imperative to conduct a research on the topic of investigating the relationship between spot and index futures markets in India with the benchmarks of stock market efficiency and volatility.

References

[1] Allen, Chakrabarti, and De (2007), “India’s Financial System”, SSRN Online Library,http://ssrn.com/abstract=1261244.
[2] Bajpai (2006), “Developments of Capital Market in India”, Conference Proceeding at London School Of Business, 2nd Oct. 2006.
[3] Bandivadekar, S. &Ghosh, S. (2003), “Derivatives and Volatility on Indian Stock Markets”, RBI Occasional Papers, Vol. 24 (3), pp. 12-28.
[4] Chhaochharia S. (2008), “Capital Market Development: The Race between China and India”, http://ssrn.com/abstract=1130074, pp. 1-15.
[5] Chan, K. (1992), “A further analysis of the lead-lag relationship between the cash market and the stock index futures market”, Review of Financial Studies, Vol.- 5, pp. 123-152.
[6] Debasish, S. S. (2009). An Empirical Study on Impact of Index Futures Trading On Spot Market in India. KCA Journal Of Business Management.
[7] Debasish, S. S. (2009). Effect of futures trading on spot-price volatility: evidence for NSE Nifty using GARCH. The Journal of Risk Finance, 10: 67 - 77.
[8] Damodaran, A. (1990). Index futures and stock market volatility. Review of Futures Markets, 9: 442 - 457.
[9] Dhankar, R., & Kumar, R. (2010). Empirical Analysis of Conditional Heteroskedasticity in Time Series of Stock Returns and Asymmetric effect on Volatility. Global Business Review, 11: 21 - 33.
[10] Floros, C. and Vougas, D. V. (2007), “Lead-Lag Relationship between Futures and Spot Markets in Greece: 1999-2001”, International Research Journal of Finance and Economics, Vol. 7, pp. 168-174.
[11] Gupta, K. and Singh, B. (2006), “Price Discovery and Causality in Spot and futures Market in India,” ICFAI Journal of Derivatives Market, Vol. III (1), pp. 30-4.
[12] Jagdeesh and Subrahmanyam (1993), “Liquidity Effects of the Introduction of the S&P 500 Index Futures Contracts on the Underlying stocks”, Journal of Business, Vol. 66, pp. 171-187.
[13] Kumar, K. K., &Mukhopadyay, C. (2007). Impact of Futures Introduction on Underlying Index Volatility: Evidence from India. Journal of Management Science, 1: 26 - 42.

[14] Kumar, R., Sarin, A., &Shastri, K. (1988). Impact of Options trading on the market quality of the underlying security: An empirical analysis. Journal of Finance, 53: 717 - 732.

[15] Karmakar, M. (2007). Asymmetric Volatility and Risk-return Relationship in the Indian Stock Market. South Asia Economic Journal, 8: 99 – 117.

[16] Karolyi, A. G. (1996). Stock Market Volatility around Expiration Days in Japan.

[17] Journal of Derivatives, 4: 23 - 43.

[18] Kan, A. C. N. (2001). Expiration-Day Effect: Evidence from high-frequency data in Hong Kong stock market. Applied Financial Economics, 11: 107 - 118.

[19] Mohan, R. (2004), "Financial Sector Reforms in India: Policies and Performance Analysis", Reserve Bank of India Bulletin, pp. 851-877.

[20] Mohan, R. (2007), "India's Financial Sector Reforms: Fostering Growth While Containing Risk", Address at Yale University on December 3, 2007.

[21] Mallikarjunappa, T. and Afsal E.M (2008), "Effect of future trading on spot market volatility: A study of CNX Bank Nifty", Asian Academy of Management Journal of Accounting and Finance, Vol. 4(2), pp.43-65.

[22] Mukherjee, K. and Mishra R.K. (2006), "Lead-Lag Relationship between Equities and Stock Index Futures Market and its Variation around Information Release: Empirical Evidence from India", NSE Research Paper, NSE India.

[23] Maniar, H. M., Bhatt, R. &Maniyar, D. M. (2009). Expiration hour effect of futures and options markets on stock market - A case study on NSE of India. International Review of Economics & Finance, 18: 381 - 391.

[24] Nath, G. C. (2003), "Behaviour of stock market volatility after derivatives", NSE working paper, Retrieved May 23, 2011, http://www.nseindia.com/content/ research/Paper60.pdf.

[25] Narang, S. (2012). Re-examining the Nifty returns after the first decade of derivative trading in Indian Capital Market using Non-linear Asymmetric GARCH Model. The International Journal of Innovation in the Digital Economy, 4.

[26] Pastor, L., Sinha, M., &Swaminathan, B. (2008). Estimating the Intertemporal Risk-Return Tradeoff Using the Implied Cost of Capital. Journal of Finance, 63: 2859 - 2897.

[27] Shirai S. (2004), "Impact of Financial and Capital Market Reforms on Corporate Finance in India", Asia-Pacific Development Journal, Vol. 11, pp. 33-52

[28] Tripathy, N. (2010). Expiration and Week effect: Empirical Evidence from the Indian Derivative Market. International Review of Business Research Papers, 6: 209 - 219.

[29] Zhang et. al (2010), "Market Efficiency Test in the VIX Futures Market", CAMA Working paper No. 8/2010, The Australian National University, pp.12.