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STATEMENT OF THE PROBLEM

OBJECTIVES

HYPOTHESES

RESEARCH METHODOLOGY

RESULTS & DISCUSSION

FINDINGS

RECOMMENDATIONS/SUGGESTIONS

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- Sharma T., Kwatra, G. (2008) Effectiveness of Social Advertising: A Study of Selected Campaigns, Corporate Social Responsibility, Edited by David Crowther & Nicholas Capaldi, Ashgate Research Companion to Corporate Social Responsibility, Chapter 15, pp 287-303.

JOURNAL AND OTHER ARTICLES

- Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

CONFERENCE PAPERS

- Garg, Sambhav (2011): "Business Ethics" Paper presented at the Annual International Conference for the All India Management Association, New Delhi, India, 19–22 June.

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- Kumar S. (2011): "Customer Value: A Comparative Study of Rural and Urban Customers," Thesis, Kurukshetra University, Kurukshetra.

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- Garg, Bhavet (2011): Towards a New Natural Gas Policy, Political Weekly, Viewed on January 01, 2012 http://epw.in/user/viewabstract.jsp

FINANCIAL DERIVATIVES IN INDIA: DEVELOPMENT PATTERN AND TRADING IMPACT ON THE VOLATILITY OF NSE

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ABSTRACT

In India, the emergence and growth of derivatives market is relatively a recent phenomenon. Since its inception in June 2000, derivatives market has exhibited exponential growth both in terms of volume and number of traded contracts. The market turn-over has grown from Rs.2365 crore in 2000-2001 to more than Rs. 4356754.53 crores in 2010-2011. Within a short span of nine years, derivatives trading in India has surpassed cash segment in terms of turnover and number of traded contracts. The present study encompasses in its scope an analysis of historical roots of derivative trading, types of derivative products, trend and growth, future prospects and challenges of derivative market in India. This paper is an attempt to examine the time varying properties of volatility of India's stock index futures market. The application of GARCH class models provides the evidence of the persistence of time varying volatility, and its asymmetric effect. It is also inferred that in India's stock index futures market, bad news increases the volatility substantially. This volatility behavior of Indian capital market may be due to recent global financial meltdown that originated from US subprime crisis. Such empirical evidence keeps much relevance to policy makers and regulators of India in devising prudential norms and implementing warranted policy reforms.

KEYWORDS

Development pattern of Financial Derivatives, Derivatives trading and its impact on volatility of NSE, Financial Derivatives, Risk Management.

INTRODUCTION

Risk is a characteristic feature of all commodity and capital markets. Over time, variations in the prices of agricultural and non-agricultural commodities occur as a result of interaction of demand and supply forces. The last two decades have witnessed a many-fold increase in the volume of international trade and business due to the ever growing wave of globalization and liberalization sweeping across the world. As a result, financial markets have experienced rapid variations in interest and exchange rates, stock market prices thus exposing the corporate world to a state of growing financial risk.

The most desired instruments that allow market participants to manage risk in the modern securities trading are known as derivatives. The main logic behind the derivatives trading is that derivatives reduce the risk by providing an additional channel to invest with lower trading cost and it facilitates the investors to extend their settlement through the future contracts. It provides extra liquidity in the stock market. They represent contracts whose payoff at expiration is determined by the price of the underlying asset a currency, an interest rate, a commodity, or a stock.

Derivatives are traded in organized stock exchanges or over the counter by derivatives dealers. The issue of the impact of derivatives trading on stock market volatility has received considerable attention in recent years in India, particularly after the stock market crash of 2001. Derivative products like futures and options on Indian stock markets have become important instruments of price discovery, portfolio diversification and risk hedging in recent times. In the last decade, many emerging and transition economies have started introducing derivative contracts.

The present study attempts to discuss the genesis of financial derivatives trading by tracing its historical development, types of derivatives products, trend and growth, future prospects and challenges of derivative market in India. The study is organised into four sections.

Section I deals with the concept, definition, features, applications and types of financial derivatives.

Section II has been devoted to a discussion of the history and growth of derivatives market. Section III discusses Derivatives trading and its impact on volatility of NSE. The last section specifies summary and concluding remarks.

AIMS AND OBJECTIVES

The main aim of this research paper is to study the development pattern of derivative market in India and its trading impact on volatility of NSE. The other objectives of the study are as follows:

- To have an overview of the Financial Derivatives.
- To understand the products and applications of Financial Derivatives
- To analyze the growth of financial derivatives in India through Futures and Options from the period of 2000-01 to 2010-11
- To study the volatility of India's stock index futures market taking into account the National Stock Exchange as the role model by employing GARCH model.
- To propose conclusion and recommendation based upon the findings.

DERIVATIVES: A FINANCIAL RISK MANAGEMENT TOOL

Risk provides the basis for opportunity. The terms *risk* and *exposure* have subtle differences in their meaning. Risk refers to the probability of loss, while exposure is the possibility of loss, although they are often used interchangeably. Risk arises as a result of exposure. Exposure to financial markets affects most organizations, either directly or indirectly. When an organization has financial market exposure, there is a possibility of loss but also an opportunity for gain or profit. Financial market exposure may provide strategic or competitive benefits.

Financial risk management is the practice of creating economic value in a firm by using financial instruments to manage exposure to risk, particularly credit risk and market risk. Other types include Foreign exchange, Shape, Volatility, Sector, Liquidity, Inflation risks, etc. Similar to general risk management, financial risk management requires identifying its sources, measuring it, and plans to address them. Financial risk management can be qualitative and quantitative. As a specialization of risk management, financial risk management focuses on when and how to hedge using financial instruments to manage costly exposures to risk.

Organizations manage financial risk using a variety of strategies and products. It is important to understand how these products and strategies work to reduce risk within the context of the organization's risk tolerance and objectives. Strategies for risk management often involve derivatives. Derivatives are traded widely

among financial institutions and on organized exchanges. The value of derivatives contracts, such as futures, forwards, options, and swaps, is derived from the price of the underlying asset. Derivatives trade on interest rates, exchange rates, commodities, equity and fixed income securities, credit, and even weather.
The products and strategies used by market participants to manage financial risk are the same ones used by speculators to increase leverage and risk. Although it can be argued that widespread use of derivatives increases risk, the existence of derivatives enables those who wish to reduce risk to pass it along to those who seek risk and its associated opportunities.

CONCEPT AND ROLE OF FINANCIAL DERIVATIVES

Financial derivatives are financial instruments whose payoffs are dependent upon other financial instruments underlying the transactions. These financial instruments can be anything from securities and currencies to indices. Some of the benefits that buyers of financial derivatives enjoy mainly include risk management and trade efficiency. This benefit is not related to the elimination of risks but is more about management of the investment risks involved. Financial derivatives prove to be powerful tools for limiting the risks which organizations and individuals have to face in ordinary conduction of the businesses.
Managing the risks successfully with financial derivatives require to understand fully the principles which govern the pricing and costs of these derivatives. Such trading activities require deep understanding and skillful execution of transactions. When used properly, it will be surprised to note how financial derivatives are able to save the costs and increase the returns.
Financial derivatives also facilitate the selling and buying of risk, and this is considered to have a great positive impact on the current economic system. Although people lose and gain money through derivatives, it does not adversely affect the economy of a country, which is a good thing to happen. Former chairman of the Federal Reserve Board, Alan Greenspan, said that the use of financial derivatives helps in softening the impact of economic downturn to a great extent. Financial derivatives are used by the investors for speculating and making profits, if the value of underlying assets moves in the desired way. Alternatively, the traders can also use these derivatives for hedging or mitigating the risks in the underlying assets, by entering into derivative contracts whose value has not moved in the expected direction.
Derivatives may be traded for a variety of reasons. Derivatives enable a trader to hedge some pre-existing risk by taking positions in derivatives markets that offset potential losses in the underlying or spot market. In India, most derivatives users describe themselves as hedgers and Indian laws generally require that derivatives be used for hedging purposes only. Another motive for derivatives trading is speculation (i.e. taking positions to profit from anticipated price movements). In practice, it may be difficult to distinguish whether a particular trade was for hedging or speculation, and active markets require the participation of both hedgers and speculators**.**
It is argued that derivatives encourage speculation, which destabilizes the spot market. The alleged destabilization takes the form of higher stock market volatility. The reason behind it is informational effect of the futures trading. Futures trading can alter the available information for two reasons: first, futures trading attract additional traders in the market; second, as transaction costs in the futures market are lower than those in the spot market, new information may be transmitted to the futures market more quickly. Thus, future markets provide an additional route by which information can be transmitted to the spot markets and therefore, increased spot market volatility may simply be a consequence of the more frequent arrival and more rapid processing of information.
Raju and Ghosh (2004) have expressed view for the consideration of volatility in the Indian stock market as tools of analysis of risk factors. Stock prices and their volatility add to the concern of attention. The growing linkages of national markets in currency, commodity and stock with world markets and existence of common players, have given volatility a new property – that of its speedy transmissibility across markets.
Among the general public, the term volatility is simply synonymous with risk. In their view, high volatility is to be deplored, because it means that security values are not dependable and the capital markets are not functioning as well as they should. Merton Miller (1991) the winner of the 1990 Nobel Prize in economics - writes in his book "Financial Innovation and Market Volatility" …. "*By volatility public seems to mean days when large market movements, particularly down moves, occur. These precipitous market wide price drops cannot always be traced to a specific news event.... The public takes a more deterministic view of stock prices; if the market crashes, there must be a specific reason.*" (Cited in Raju and Ghosh 2004).
The volatility on the Indian stock exchanges may be thought of as having two components: The volatility arising due to information based price changes and Volatility arising due to noise trading/ speculative trading, i.e., destabilizing volatility. As a concept, volatility is simple and intuitive.

APPLICATIONS OF FINANCIAL DERIVATIVES

Some of the applications of financial derivatives can be enumerated as follows:
1. *Management of risk:* This is most important function of derivatives. Risk management is not about the elimination of risk rather it is about the management of risk. Financial derivatives provide a powerful tool for limiting risks that individuals and organizations face in the ordinary conduct of their businesses. It requires a thorough understanding of the basic principles that regulate the pricing of financial derivatives. Effective use of derivatives can save cost, and it can increase returns for the organisations.
2. *Efficiency in trading*: Financial derivatives allow for free trading of risk components and that leads to improving market efficiency. Traders can use a position in one or more financial derivatives as a substitute for a position in the underlying instruments. In many instances, traders find financial derivatives to be a more attractive instrument than the underlying security. This is mainly because of the greater amount of liquidity in the market offered by derivatives as well as the lower transaction costs associated with trading a financial derivative as compared to the costs of trading the underlying instrument in cash market.
3. *Speculation:* This is not the only use, and probably not the most important use, of financial derivatives. Financial derivatives are considered to be risky. If not used properly, these can leads to financial destruction in an organisation like what happened in Barings Plc. However, these instruments act as a powerful instrument for knowledgeable traders to expose themselves to calculated and well understood risks in search of a reward, that is, profit.
4. *Price discover:* Another important application of derivatives is the price discovery which means revealing information about future cash market prices through the futures market. Derivatives markets provide a mechanism by which diverse and scattered opinions of future are collected into one readily discernible number which provides a consensus of knowledgeable thinking.
5. Price stabilization function: Derivative market helps to keep a stabilising influence on spot prices by reducing the short-term fluctuations. In other words, derivative reduces both peak and depths and leads to price stabilisation effect in the cash market for underlying asset.

TYPES OF FINANCIAL DERIVATIVES

A. Forwards: A forward contract is a customized contract between two entities, where settlement takes place on a specific date in the future at today's pre-agreed price.
B. Futures: A futures contract is an agreement between two parties to buy or sell an asset at a certain time in the future at a certain price. Futures contracts are special types of forward contracts in the sense that the former are standardized exchange-traded contracts.
C. Options: Options are of two types - calls and puts. Calls give the buyer the right but not the obligation to buy a given quantity of the underlying asset, at a given price on or before a given future date. Puts give the buyer the right, but not the obligation to sell a given quantity of the underlying asset at a given price on or before a given date.
D. Warrants: Options generally have lives of upto one year, the majority of options traded on options exchanges having a maximum maturity of nine months. Longer-dated options are called warrants and are generally traded over-the-counter.
E. LEAPS: The acronym LEAPS means Long-Term Equity Anticipation Securities. These are options having a maturity of upto three years.
F. Baskets: Basket options are options on portfolios of underlying assets. The underlying asset is usually a moving average or a basket of assets. Equity index options are a form of basket options.

I. Swaps: Swaps are private agreements between two parties to exchange cash flows in the future according to a prearranged formula. They can be regarded as portfolios of forward contracts. The two commonly used swaps are:

• Interest rate swaps: These entail swapping only the interest related cash flows between the parties in the same currency.

• Currency swaps: These entail swapping both principal and interest between the parties, with the cash flows in one direction being in a different currency than those in the opposite direction.

J. Swaptions: Swaptions are options to buy or sell a swap that will become operative at the expiry of the options. Thus a swaption is an option on a forward swap. Rather than have calls and puts, the swaptions market has receiver swaptions and payer swaptions. A receiver swaption is an option to receive fixed and pay floating. A payer swaption is an option to pay fixed and receive floating.

DEVELOPMENT PATTERN OF FINANCIAL DERIVATIVES

HISTORY OF DERIVATIVES MARKET IN INDIA

The history of derivatives may be new for developing countries but it is old for the developed countries. The history of derivatives is surprisingly longer than what most people think. The derivatives contracts were done not formally in the old times in the informal sectors. The advent of modern day derivative contracts is attributed to the need for farmers to protect themselves from any decline in the price of their crops due to delayed monsoon, or overproduction.

The first derivative as 'futures' contracts were introduced in the Yodoya rice market in Osaka, Japan around 1650. The contracts were evidently standardised contracts, like today's futures. The commodity derivative market has been functioning in India since the nineteenth century with organized trading in cotton through the establishment of Cotton Trade Association in 1875. In 1952, the Government of India banned cash settlement and options trading. Derivatives trading shifted to informal forwards markets. In recent years, government policy has shifted in favour of an increased role of market-based pricing and less suspicious derivatives trading. The first step towards introduction of financial derivatives trading in India was the promulgation of the Securities Laws (Amendment) Ordinance, 1995. It provided for withdrawal of prohibition on options in securities. The last decade, beginning the year 2000, saw lifting of ban on futures trading in many commodities. Around the same period, national electronic commodity exchanges were also set up.

Derivatives trading commenced in India in June 2000 after SEBI granted the final approval to this effect in May 2001 on the recommendation of L. C Gupta committee. Securities and Exchange Board of India (SEBI) permitted the derivative segments of two stock exchanges, NSE3 and BSE, and their clearing house/corporation to commence trading and settlement in approved derivatives contracts.

Initially, SEBI approved trading in index futures contracts based on various stock market indices such as, S&P CNX, Nifty and Sensex. Subsequently, index-based trading was permitted in options as well as individual securities.

The trading in BSE Sensex options commenced on June 4, 2001 and the trading in options on individual securities commenced in July 2001. Futures contracts on individual stocks were launched in November 2001. The derivatives trading on NSE commenced with S&P CNX Nifty Index futures on June 12, 2000. The trading in index options commenced on June 4, 2001 and trading in options on individual securities commenced on July 2, 2001. Single stock futures were launched on November 9, 2001. The index futures and options contract on NSE are based on S&P CNX. In June 2003, NSE introduced Interest Rate Futures which were subsequently banned due to pricing issue. Table 1 gives chronology of introduction of derivatives in India.

TABLE 1: DERIVATIVES IN INDIA: A CHRONOLOGY

Date	Progress
14 December 1995	NSE asked SEBI for permission to trade index futures
18 November 1996	SEBI setup L. C. Gupta Committee to draft a policy framework for index futures.
11 May 1998	L. C. Gupta Committee submitted report.
7 July 1999	RBI gave permission for OTC forward rate agreements (FRAs) and interest rate swaps
24 May 2000	SIMEX chose Nifty for trading futures and options on an Indian index.
25 May 2000	SEBI gave permission to NSE and BSE to do index futures trading.
9 June 2000	Trading of BSE Sensex futures commenced at BSE.
12 June 2000	Trading of Nifty futures commenced at NSE.
31 August 2000	Trading of futures and options on Nifty to commence at SIMEX.
June 2001	Trading of Equity Index Options at NSE
July 2001	Trading of Stock Options at NSE
November 9, 2002	Trading of Single Stock futures at BSE
June 2003	Trading of Interest Rate Futures at NSE
September 13, 2004	Weekly Options at BSE
January 1, 2008	Trading of Chhota (Mini) Sensex at BSE
January 1, 2008	Trading of Mini Index Futures & Options at NSE
August 29,2008	Trading of Currency Futures at NSE
October 2,2008	Trading of Currency Futures at BSE

Source: Complied from BSE and NSE

GROWTH OF DERIVATIVES MARKET IN INDIA

Equity derivatives market in India has registered an "explosive growth" and is expected to continue the same in the years to come. Introduced in 2000, financial derivatives market in India has shown a remarkable growth both in terms of volumes and numbers of traded contracts. NSE alone accounts for 99 percent of the derivatives trading in Indian markets. The introduction of derivatives has been well received by stock market players. Trading in derivatives gained popularity soon after its introduction. In due course, the turnover of the NSE derivatives market exceeded the turnover of the NSE cash market. For example, in 2010-11, the value of the NSE derivatives markets was Rs. 29248221.09 Cr. whereas the value of the NSE cash markets was only Rs. 35,77,412Cr. (See Table 2 through Table 5).

Among all the products traded on NSE in F& O segment, single stock futures also known as equity futures, are most popular in terms of volumes and number of contract traded, followed by index futures with turnover shares of 52 percent and 31 percent, respectively. In case of BSE, index futures outperform stock futures. An important feature of the derivative segment of NSE which may be observed from Table 4 and Table 5 is the huge gap between average daily transactions of its derivatives segment and cash segment. The following are some observations based on the trading statistics provided in the NSE report on the futures and options (F&O):

TABLE 2: NSE DERIVATIVES SEGMENT TURNOVER (Rs. in Cr.)

Year	Index Futures	Stock Futures	Index Options	Stock Options	Interest Rate Futures	Total	Average Daily Turnover
2010-11	4356754.53	5495756.70	18365365.76	1030344.21	0.00	29248221.09	121352.32
2009-10	3934388.67	5195246.64	8027964.20	506065.18	0.00	17663664.57	72392.07
2008-09	3570111.40	3479642.12	3731501.84	229226.81	0.00	11010482.20	45310.63
2007-08	3820667.27	7548563.23	1362110.88	359136.55	0.00	13090477.75	52153.30
2006-07	2539574	3830967	791906	193795	0	7356242	29543
2005-06	1513755	2791697	338469	180253	0	4824174	19220
2004-05	772147	1484056	121943	168836	0	2546982	10107
2003-04	554446	1305939	52816	217207	202	2130610	8388
2002-03	43952	286533	9246	100131	-	439862	1752
2001-02	21483	51515	3765	25163	-	101926	410
2000-01	2365	-	-	-	-	2365	11

Source: Complied from NSE website

TABLE 3: NSE CASH & DERIVATIVES SEGMENT TURNOVER (Rs. in Cr.)

Year	Cash Segment	Derivatives Segment
2010-11	35,77,412	29248221.09
2009-10	4,138,024	17663664.57
2008-09	2,752,023	11010482.20
2007-08	3,551,038	13090477.75
2006-07	1,945,285	7356242
2005-06	1,569,556	4824174
2004-05	1,140,071	2546982
2003-04	1,099,535	2130610
2002-03	617,989	439862
2001-02	513,167	101926
2000-01	1,339,510	2365

Source: Complied from NSE website

TABLE 4: NUMBER OF CONTRACT TRADED AT NSE DERIVATIVES SEGMENT (Rs. in Cr.)

Year	Index Futures	Stock Futures	Index Options	Stock Options	Interest Rate Futures	Total
2010-11	165023653	186041459	650638557	32508393	0	1034212062
2009-10	178306889	145591240	341379523	14016270	0	679292922
2008-09	210428103	221577980	212088444	13295970	0	657390497
2007-08	156598579	203587952	55366038	9460631	0	425013200
2006-07	81487424	104955401	25157438	5283310	0	216883573
2005-06	58537886	80905493	12935116	5240776	0	157619271
2004-05	21635449	47043066	3293558	5045112	0	77017185
2003-04	17191668	32368842	1732414	5583071	10781	56886776
2002-03	2126763	10676843	442241	3523062	-	16768909
2001-02	1025588	1957856	175900	1037529	-	4196873
2000-01	90580	-	-	-	-	90580

Source: complied from NSE website

TABLE 5: AVERAGE DAILY TRANSACTION AT NSE IN DERIVATIVES AND CASH SEGMENT (Rs. in Cr.)

Year	Derivatives Segment	Cash Segment
2010-11	115150.48	14,048
2009-10	72392.07	16,959
2008-09	45310.63	11,325
2007-08	52153.30	14,148
2006-07	29543	7,812
2005-06	19220	6,253
2004-05	10107	4,506
2003-04	8388	4,328
2002-03	1752	2,462
2001-02	410	2,078
2000-01	11	5,337

Source: Complied from NSE website and NSE fact book 2008

DERIVATIVES TRADING AND ITS IMPACT ON VOLATILITY OF NSE

Introduced in 2000, financial derivatives market in India has shown a remarkable growth both in terms of volumes and numbers of contracts traded. National Stock Exchange (NSE) alone accounts for 99 percent of the derivatives trading in Indian markets. The introduction of derivatives has been well received by stock market players. Trading in derivatives gained popularity soon after its introduction. In due course, the turnover of the NSE derivatives market exceeded the turnover of the NSE cash market. For example, in 2010-11, the value of the NSE derivatives markets was Rs. 2, 92, 48,221.09 Cr. whereas the value of the NSE cash markets was only Rs. 35, 77,412 Cr. Among all the products traded on NSE in F& O segment, single stock futures also known as equity futures, are most popular in terms of volumes and number of contract traded, followed by index futures with turnover shares of 52 percent and 31 percent, respectively. Despite the encouraging growth and developments, financial analysts feel that the derivatives market in India has not yet realized its full potential in terms of growth and trading. The reason might be the relatively high level of volatility.

Thus, it is important to examine the dynamics of volatility of India's stock index futures market. Volatility is often described as the rate and magnitude of changes in prices and in finance often referred to as risk. In the finance literature there exist voluminous research studies addressing to the issue of capital market volatility (For example, Danthine, 1978; Harris, 1989; Min and Najand, 1999; Gulen and Mayhew, 2000; Thenmozhi, 2002; Nath, 2003; Kanas, 2009;

Gannon, 2010; Mishra, 2010). However, the literature is scrawny regarding the studies addressing the volatility of index futures market in emerging market economies like India.

METHODOLOGY, ANALYSIS AND DISCUSSION

The very objective of this paper is to investigate the dynamics of the time varying volatility of India's index futures market over the sample period spanning from June 2000 to May 2011. The data of daily returns based on daily closing values of near month index futures contract (FUTIDX) has been used in the study. The required data are collected for the sample period from the NSE, India database. As capital market volatility is effectively depicted with the help of GARCH class model, the estimations of the GARCH model have been performed so as to produce the evidence of time varying volatility which shows clustering, high persistence and predictability and responds symmetrically for positive and negative shocks.

In the finance literature, GARCH class models are popular in capturing the dynamics of capital market volatility. For initial volatility estimation, the GARCH (1, 1) model is used (Bollerslev, 1986). The model for return series is specified as under:

Mean Equation: $R_t = \chi + \varepsilon_\tau$

Variance Equation: $\sigma_\tau^2 = \omega + \alpha_1 \varepsilon_{\tau-1}^2 + \beta_1 \sigma_{\tau-1}^2$

TABLE-6: RESULTS OF GARCH MODEL

	Coefficient	Std Error	z-Statistic	Prob.
Variance Equation				
ω	7.84E-06	7.93E-07	9.891693	0.0000
α_1	0.140525	0.008813	15.94476	0.0000
β_1	0.838001	0.009292	90.18246	0.0000

The GARCH model assumes that the effect of a return shock on current volatility declines geometrically over time. This model is consistent with the volatility clustering where large changes in stock returns are likely to be followed by further large changes. The results of estimation of the GARCH model is reported in Table-6. It is clear that the bulk of the information comes from the previous days forecast, i.e., around 83% in case of Index Futures Market. The new information changes this a little and the long run average variance has a very small effect.

It can be assessed that the amplitude of the daily stock returns is changing in the Index futures market. The magnitude of this change is sometimes large and sometimes small. This is the effect that GARCH is designed to measure and that we call volatility clustering. There is another interesting feature is that the volatility is higher when prices are falling than when prices are rising. It means that the negative returns are more likely to be associated with greater volatility than positive returns. This is called asymmetric volatility effect. The change in the pattern of volatility and the recent irregular behaviour of the futures market came as a result of the global economic events, particularly the recent sub-prime crisis and news of probable recession.

SUMMARY AND CONCLUSION

The global liberalization and integration of financial markets has created new investment opportunities, which in turn require the development of new instruments that are more efficient to deal with the increased risks. Institutional investors who are actively engaged in industrial and emerging markets need to hedge their risks from these internal as well as cross-border transactions. Agents in liberalised market economies who are exposed to volatile commodity price and interest rate changes require appropriate hedging products to deal with them. And the economic expansion in emerging economies demands that corporations find better ways to manage financial and commodity risks.

Increased financial risk causes losses to an otherwise profitable organisation. This underlines the importance of risk management to hedge against uncertainty. Derivatives provide an effective solution to the problem of risk caused by uncertainty and volatility in underlying asset. Derivatives are risk management tools that help an organisation to effectively transfer risk. Derivatives are instruments which have no independent value. Their value depends upon the underlying asset. The underlying asset may be financial or non-financial.

This paper, therefore studied the volatility of India's stock index futures market taking into account the National Stock Exchange as the role model. The study by employing GARCH, model, provides the evidence of high persistence of time varying volatility, and its asymmetric effects. This volatility behaviour of Indian capital market may be due to recent global financial slowdown that originated from US sub-prime crisis. The results indicate that the trading volume growth of nearby-month index futures is the most influential factor for volatility in the futures market in India. Therefore, the investors are advised to predict volatility in the cash market by observing the futures volume growth as well as volatility in the index futures since volatility in the cash market is a measure of market risk.

REFERENCES

1. Antoniou, A., Holmes, P., Priestly, R., (1998). "The effects of stock index futures trading on stock index volatility: An analysis of the asymmetric response of volatility to news". Journal of Futures Markets, Vol.18, pp.151-166
2. Brorsen, B.W., (1991). "Futures Trading, Transactions Costs, and stock market volatility". Journal of Futures Markets, Vol.11, pp.153-163.
3. Bodla, B. S. and Jindal, K. (2008), 'Equity Derivatives in India: Growth Pattern and Trading Volume Effects', The Icfai Journal of Derivatives Markets, Vol. V, No. 1, pp.62-82.
4. Danthine, J. (1978): "Information, futures prices, and stabilizing speculation", Journal of Economic Theory, 17, 79–98.
5. Edwards, F.R., (1988a). "Does futures trading increase stock market volatility?" Financial Analysts Journal, pp.63-69.
6. Gannon, G.L. (2010): "Simultaneous Volatility Transmission and Spillover Effects", Review of Pacific Basin Financial Market and Policies, 13(1): 127-56.
7. Gulen, H. and Mayhew, S. (2000): "Stock Index Futures Trading and Volatility in International Equity Markets," The Journal of Futures Markets, Vol. 20, No. 7, 661-685.
8. Harris, L. (1989). S&P 500 cash stock price volatilities. Journal of Finance, 44, 1155–1175.
9. Harish, A. S. (2001) 'Potential of Derivatives Market in India', The ICFAI Journal of Applied Finance, Vol. 7, No.5, pp 1-24.
10. Kaur, P.(2004), 'Financial derivatives: Potential of derivative market in India and emerging derivatives market structure in India' available at: www.icwai.org/icwai/knowledgebank (accessed on May 28, 2009)
11. Kanas A (2009): "Regime Switching in Stock Index and Futures Markets: A Note on the Nikkei Evidence", International Journal of Financial Economics, 14(4): 394-99.
12. Lee, S.B., Ohk, K.Y., (1992). "Stock Index Futures Listing Structural Change in Time Varying Volatility". Journal of Futures Markets. Vol.12, pp.493-509.
13. Misra Dheeraj and Misra Sangeeta D (2005), 'Growth of Derivatives in the Indian Stock Market: Hedging v/s Speculation', The Indian Journal of Economics, Vol. LXXXV, No. 340.
14. Min, J. H, Najand, M. (1999): "A Further Investigation of the Lead-Lag Relationship between the Spot Market and Stock Index Futures: Early Evidence from Korea", Journal of Futures Market, 19(2): 217-232.
15. Nath, G. C. (2003): "Behaviour of stock market volatility after derivatives", NSE working paper, http://www.nseindia.com/content
16. NSE fact book, 2008 Issue, available at: http://www.nseindia.com.(accessed on May 15, 2009)
17. Reddy, Y. V. and Sebastin, A. (2008), 'Interaction between Equity and Derivatives Markets in India: An Entropy Approach', The Icfai Journal of Derivatives Markets, Vol. V, No.1, pp.18-32.
18. Thenmozhi, M. (2002): "Futures Trading, Information and Spot Price Volatility of NSE-50 Index Futures Contract", NSE working paper, http://www.nseindia.com/content/ research
19. Zakoian, J. M. (1994): "Threshold Autoregressive Models", Journal of Economic Dynamic Control, Vol.18, pp.931-955

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