INVESTMENT PERFORMANCE OF DERIVATIVE BASED INVESTMENT STRATEGIES : EMPIRICAL EVIDENCE

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ABSTRACT

Empirical literature on finance indicates numerous investment strategies based on fundamental factors such as price-earnings ratio, book to market ratio, size effect, value premium etc. to magnify the returns of investor in investment jargon. In the present paper, an attempt has been made to examine the profitability associated with derivatives based investment strategies i.e. Long Future (Naked), Covered Call, Long Straddle, Short Straddle in Indian capital market during the period of June 2000 to December 2010. The empirical results exhibited that average monthly returns of all the four investment strategies studied for the whole study period were noted higher than the average riskless return and benchmark index. The long straddle investment strategy scored highest average monthly return (18.88 percent) among all the derivative investment strategies and long future (naked) investment strategy delivered lowest average monthly performance (4.63 percent) in this regard. On the other hand, the present paper reveals none of the strategies generated lower variability of returns than the market portfolio i.e. CNX Nifty-50 during the entire study period. The information inputs depict the long straddle investment strategy as highest risky (92.87 percent) investment strategy among all the derivative investment strategies and short straddle investment strategy delivered lowest variability of monthly returns (10.54 percent) in this regard. The performance outcomes in terms of risk adjusted performance i.e. Sharpe ratio reveals that the majority of investment strategies (3 out of 4) have outperformed the benchmark market proxy. The average Sharpe ratio of short straddle investment strategy (1.63) was observed highest among all the investment strategies. On the other hand, long straddle emerged as looser investment strategy (0.09) during the whole study period. Thus, the present paper documents evidences of superior investment performance that could be constructed better than that of the passive benchmark portfolio. On the whole, the study indicates the ability of the derivative based investment managers to meet the expectations of the investors.

Keywords: Derivatives, Stock Market Volatility, JEL Classification: G11, G14

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INTRODUCTION

Investment strategy is a procedure basically designed to pioneer investors for making investment in the financial markets or designing the portfolio that can yield maximum return at the minimum risk to the investors. Sharpe (2004) stated that investment strategy is not an approach for short-term trading. It is, alternatively, the key element of a plan designed to take into account the needs and circumstances of a particular investor. Together, a financial advisor and an investor can use the tools of financial economics to craft an investment strategy that will be both efficient and suitable for the investor in
question. In financial literature, various strategies have been designed and examined by investment managers, academicians and practitioners to achieve this objective. Broadly these strategies are divided into two parts i.e. Passive and Active Strategies. These strategies are very much in circulation for the investment management of portfolios.

To exploit these strategies, the derivatives instruments have been considerably employed by investment managers as well as investors across the globe. The major advantage of derivative products is their suitability to hedgers, speculators and arbitragers. Hedgers basically hedge their risk of existing underlying positions, speculators accept the risk offered by hedgers and arbitragers establish an efficient link between markets. The unusual pay-offs from equity derivatives, enables investors to create patterns of portfolio pay offs that are unattainable by a simple combination of conventional investment instruments (i.e. stocks and fixed income securities). Derivatives trading started in India in the year 2000 and from the very beginning rapid growth has been noted in this market. Primarily, the present study purports to evaluate the investment performance of four derivatives based investment strategies i.e. Long Future (Naked), Covered Call, Long Straddle, Short Straddle in Indian capital market. The above mentioned investment strategies used in the present study are overwhelmingly being applied by investment managers due the their less complex structure and application in comparison to other tedious derivative instruments, as risk management tool as well as to attain the investment performance greater than market portfolio.

EVIEW OF LITERATURE

Available literature on investment strategies have shown that there is no specific or standardized strategy, investors can rely upon. Every study has shown different ways of managing investments such as Fama and French (1993) identified five common risk factors in the returns of stocks and bonds in formulating investment strategies and revealed that out of five, three risk factors are related to stock market i.e. an overall market factors, firm size and book-to-market equity and two factors i.e. maturity and default risks are associated with bond market. Adam and Maurer (1999) examined the performance of protective put and covered short call strategies by making some assumption about investor's tolerance and revealed that both the strategies had lower expected return in comparison to the pure stock options but protective put looked more impressive than covered short call strategy. Arshanapalli, Switzer and Hung (2004) established a dynamic asset allocation strategy investing in EAFE (Europe, Australia and Far East) and the S&P 500 indexes to time the market and generate a superior abnormal return on a portfolio. Results revealed that an out-of-sample tests along with the transaction costs showed, an investor can rely on model signals to allocate assets between the indexes and produce significantly more terminal wealth than would passive portfolios invested in either index alone.

Bartram (2004) investigated the motivation behind the use of options as a risk management tool and stated that in the presence of uncertain exposure due to price and quantity risk, options might be a useful component of corporate risk management. Sehgal and Tripathi (2005) investigated the size effect in Indian stock market by taking the sample of 482 Indian companies for the time period of 1990-2003. The results of the study indicated that size based investment strategy are economically feasible as it provides extra normal returns on risk adjusted basis and also not affected by any seasonality or business cycle factors. Hsu and Campollo (2006) examined the performance of fundamental indexation strategy used for investment purpose. Empirical results revealed that fundamental indexes outperformed their respective cap benchmark significantly two per cent per annum in United States and 3.5 per cent globally. Best, Best, Hodges and Yoder (2007) investigated the empirical relationship between the Sharpe ratio and the investment horizon for portfolios of small stocks, large stocks, and corporate bonds and evidenced that relative portfolio rankings varied with the investment horizon and portfolio rankings for auto correlated returns were different from those for independent returns. Choudhary (2007) examined the relationship between investment performance of equity securities and alternatives investment strategies based on their market capitalization, P/E ratio and earning per share by taking the time period of 1997-2005. The results of the study revealed that low market capitalization strategy was found superior to both low P/E ratio and low earning per share investment strategies in terms of absolute and risk adjusted rate of return. Assogbavi and Leonard (2008) examined the momentum investment strategy based on past market information to evaluate performance, time formation/holding period and seasonality impact on the Canadian market. It was evidenced that investors who based their portfolio construction on momentum investment strategy earned higher returns by shortening their portfolio formation/holding periods. Malik (2008) evaluated the performance of six derivatives based investment. The results indicated the superior performance of index futures (naked) and covered call and options based investment strategies like straddle and strangle could not generate better performance than benchmark portfolio.

Tripathi (2008) examined the perception, preferences and various investment strategies in Indian stock market by

conducting a survey of 93 investment analysts, fund managers and active equity investors in the area of Delhi and Mumbai. The results of the study revealed that investors used both fundamental as well as technical analysis while investing in Indian stock market. Bernstein, Lerner and Schoar (2009) examined the direct private equity investment strategies across Sovereign Wealth Funds and their relationship to the funds' organizational structure. It was evidenced that Sovereign Wealth Funds particularly those with the active involvement of political leaders were associated with trend chasing since these funds were more likely to invest at home when domestic equity prices were higher and invested in abroad when foreign equity prices were higher.

Singh and Choudhary (2009) investigated whether overreaction hypothesis matters in the Indian stock market. The results of the study documented non-existence of overreaction hypothesis while the abnormal returns were exhibited by momentum investment strategies of one-year holding period in Indian equity market. Tripathi (2009) examined the relationship between four company fundamental variables i.e. market capitalization, book equity to market equity ratio, price earning ratio and debt equity ratio and equity returns in Indian stock market and exhibited that market capitalizations and price earnings ratio have statistically significant negative relationship with equity returns while book equity to market ratio have statistically significant positive relationship with equity returns in India. The results of the study also showed that investment strategy based on these above mentioned variables produced extra risk adjusted returns over the study period. Choudhary and Choudhary (2010) examined the association of systematic risk and return in Indian equity market and suggested that higher risk is associated with higher levels of returns. Loffe and Cour (2010) investigated the performance of contrarian and momentum strategy on the Russian Stock Market by considering the period of 1996-2009 and found no evidence for the presence of profits due to contrarian and momentum strategies on the Russian stock market. It was also revealed that both the strategies have produced undistinguished profits irrespective of the time periods. Boasson and Boasson (2011) examined the risk and return performance of hedge fund investment strategies applied on S&P 500 Index. The results revealed that all the hedge fund investment strategies seemed to provide an attractive investment opportunity for exploiting market inefficiencies, market failures and arbitrage opportunities. Mankar (2012) tested the performance of moment investment strategy and evidenced that superior returns can be secured by following the securities' historical data without bearing extra amount of risk. Knapp (2013) hypothesised that analysts have limited knowledge for the market even if they are experts which cause them to formulate investment strategies by seeing the patterns that are actually absent in the market and results in poor investment decisions. For the determination of best trading strategy, knapp and his team randomly applied four investment strategies i.e. momentum, relative strength indicator, up and down persistency and the moving average convergence random investment strategy by taking ten to fifteen years data of four different stock indices: the UK FTSE, the MIB FTSE (Italian stocks), the DAX (German) and the S&P 500 and concluded that random application of above mentioned four strategies show less volatility than sticking with one of the strategies.

On the basis of above literature, it can be rightly said that there is no single standardized strategy that can be used by investors to earn money. Every paper has taken into account different strategy for making money in the stock market such as some papers have dealt with the fundamentals of the companies i.e. earning yield, book to market ratio and cash flow yield for making investments whereas others have considered momentum and contrarian strategies. It is worthwhile mentioning here that there are very few papers that have examined derivatives based investment strategies. In this line the present paper is an attempt to exclusively evaluate the investment performance of derivative based investment strategies in Indian market and contribute to existing literature which still lacks the paper such as the present one.

ESEARCH METHODOLOGY

Objectives of the Paper

To examine the investment performance of various derivatives based investment strategies.

To examine the risk-return relationship of different investment strategies.

Investment Strategies

The present study has considered four investment strategies involving the use of S&P CNX Nifty futures and options. The strategies are as follows: -

Long Future (Naked): A future contract is a standardized forward contract. Future contract is called long future, if an investor enters into a contract to buy something in the future. It is called naked because investor does not enter into any kind of counter contract.

Covered Call: The covered call is a strategy in which investor sells a call option on a stock which he owns. An OTM (Out of the Money) call is sold. This strategy is adopted by the investors who are neutral to moderately bullish about the stock. This option is exercised only if the stock price increases above the strike price.

Long Straddle: A straddle is a strategy which is used when a stock/index price is expected to show very large movements. Under this strategy, an investor takes a long position (buying) of call and put on the same stock/index at the same maturity and strike price.

Short Straddle: Short straddle is totally the opposite of long straddle. Under this strategy, an investor takes a short

position (selling) of call and put on the same stock/index at the same maturity and strike price.

ATA SOURCE AND TIME PERIOD

For the purpose of present study, S&P CNX Nifty has been considered as a representative index of stock market for the evaluation of the derivatives based investment strategies in India. S&P CNX Nifty tracks the behavior of a portfolio of blue chip companies i.e. the largest and most liquid Indian securities. It covers 25 sectors of the Indian economy and offers investment managers exposure to the Indian market in one efficient portfolio. Nifty includes 50 of the approximately 1,300 companies listed on the NSE, captures approximately 60 per cent of its equity market capitalization and is a true reflection of the Indian stock market. Therefore, S&P CNX NIFTY has been considered as underlying asset for the application of various investment strategies. Index futures on S&P CNX Nifty were permitted for trading on National Stock Exchange (NSE) in June 12, 2000 and Index options were introduced on S&P CNX NIFTY in June 29, 2001 and till now, India's experience with the equity derivatives market has been extremely positive e.g. the derivatives turnover on the NSE has surpassed the equity market turnover i.e. turnover of derivatives on the NSE increased from Rs. 24 billion in 2000–2001 to Rs. 292,482 billion in 2010–2011, and reached Rs. 313,497 billion in 2011–2012. The average daily turnover in this segment of the markets on the NSE was Rs.1,259 billion in 2011–2012 compared to Rs. 1,152 billion in 2010–2011*. The present paper has considered the historical data of Index futures and Spot Nifty from June 12, 2000 to December 31, 2010 and Index options from June 29, 2001 to December 31, 2010. Data for Index option have been collected from NSE Website (www.nseindia.com) and data for Index futures and Spot Nifty have been taken from the database Metastock.

The present paper followed the methodology of maintaining derivatives based investment strategies offered by Malik (2007). In the present paper, S&P CNX Nifty has been taken as an underlying asset for the purpose of investment. Four derivatives based portfolios have been constructed by taking into account the six different strategies namely Long Future (Naked), Covered Call, Long Straddle, Short Straddle. For comparing the results of derivatives portfolio, cash portfolio on the S&P CNX Nifty over the corresponding period of time to that of derivatives portfolios has also been considered. A simulation procedure has been employed by adopting the philosophy of buy- and- hold for all the portfolios (derivatives as well as cash) with an initial investment of Rs. 1,00,000 (Rs. one lakh) for each portfolio. The amount has been used as margin money for taking exposure in futures and options (short) and paying of option premium for taking long position in the options. It has been presumed that twenty five percent of the notional value of exposure at every point in time would be the minimum required margin. The transaction cost of buying and selling the contract has not been considered. The buy-and-hold method has been used for derivatives portfolio and spot portfolio, where Nifty futures contracts have been purchased at the beginning of the contract and was held till the expiry of the futures contract during the entire period under study. In the case of maintaining the long position (long naked future) in the index futures, the rolling approach has been used. The rolling approach refers that at the expiry of every month's futures contract, the next month contract would be purchased at the closing price on the last day of the expiry of the preceding month and the futures contract of the current month would be squared-off or allowed to expire at the closing price on the expiry of the contract, and so on the position in the index futures contracts are rolled over the entire period of 127 months beginning from June 12, 2000 to December 31, 2010. In case of covered call, the long position in the index futures have been covered by taking the short position of the out-of-money calls with strike price higher by 1-2 percent of the spot closing price. However, in the case of investment strategies involving options, the straddle (long as well as short), the present paper has taken out-of-money calls with strike price higher by 1-2 percent and in-the-money put with strike price higher by 1-2 percent of the spot price on the day of entering into the contracts amounting in the formation of straddle for the purpose of empirically examining the performance of straddle (long as well as short).

NVESTMENT PERFORMANCE MEASUREMENT

Return is prime motive to persuade investments and probably the one to sustain it. In the present paper, the simple percentage return has been considered and calculated by following the equation: -

$$R_i = \frac{P_t - P_{t-1}}{P_{t-1}} X\ 100 \qquad (1)$$

Where,

R_i =Monthly return on investment, P_t=Investment value at the time of Expiry, P_{t-1}= Value of Investment in the beginning.

Uncertainty of expected return geminates risk, which is defined as the quantification of varying expectations. In investment parlance, risk is represented by variability in expected return stream and is better measured by sigma ($_i$).In the present paper the risk has been expressed in terms of standard deviation of monthly returns and calculated by following the equation: -

$$_i = \sqrt{\frac{(R_i - \bar{R}_i)^2}{n-1}} \qquad (2)$$

Where,

$_i$=Standard Deviation, R_i=Return on investment, $\bar{R}_i$=Mean return

Though risk - return analysis is an important dimension of investment performance evaluation yet it is not adequate to depict the whole picture of investment performance. In finance literature, simultaneous cognizance of risk and return along with the benchmark portfolio return has been preferred

for investment performance measurement. Taking cue from this the present paper has also used Sharpe's ratio to examine the performance of investment strategies. The measure of the ratio is: -

$$S_i = \frac{R_i - R_f}{i} \qquad (3)$$

Where,

S_i=Sharpe Ratio, R_i=Return on Investment,

$_i$=Risk free Return, $_i$=Standard Deviation

The Sharpe ratio is computed for all the four investment strategies and for the benchmark index for each year of the study period i.e. 2000-2010.

MPIRICAL RESULTS AND DISCUSSIONS

Risk-Return Analysis

Investment is considered as the postponement of current consumption in anticipation of expected benefits. Investors defer consumption to yield maximum possible expected cash flows to magnify returns by acquiring ownership of financial instruments with varying expectations of return. The inherent feature of investment is the uncertainty of expected return which geminates risk, the quantification of varying expectations. Risk-return is an integral part of investment decision-making and the twin acts as a vital input in investment performance measurement and reporting. Return is prime mover to induce investments and probably the one to sustain it. Market participants are always tempted to scout for better investment alternatives for higher return / yield. Table 1 exhibits the performance inputs regarding return of the derivative based investment strategies such as Long Future (Naked), Covered Call, Long Straddle and Short Straddle with underlying asset as S&P CNX Nifty. Furthermore, the Table also contains the returns of spot market investment strategy (buy and hold of Nifty cash portfolio) and return of risk free asset i.e. 364 days Treasury bill of government of India.

The empirical results reveal that in the majority of whole study period (7 out of 11 years) long future investment strategy has generated superior average monthly returns over the riskless return. In relation to benchmark investment strategy i.e. investment in CNX Nifty spot portfolio, long future investment strategy has yielded better-average monthly return in majority of years of whole study period. However, it is curious to note that average monthly return for whole study period (4.63 percent) was noted higher than the riskless return (0.54 percent) as well as market returns (1.12 percent). It contradicts the Treynor (1965) premise that investment is to put the money down the rat hole. Another useful derivative based strategy is Covered call whereby an investor holds a long position in an asset and writes (sells) call option on that same asset in an attempt to generate increased income from the asset. This is often employed when an investor has a short-term neutral view on the asset and for this reason holds the asset long and simultaneously has a short position via the option to generate income from the option premium.

The performance inputs of covered call strategy based on S&P CNX Nifty for the period of 114 months reveal that in the majority of whole study period (9 out of 10 years) covered call investment strategy has yielded superior average monthly returns over the riskless return and spot market investment strategy. It is worthwhile to mention that average monthly return of covered call for whole study period (8.49 percent) was noted higher than the riskless return (0.52 percent) as well as market returns (1.43 percent). In the league of investment strategy, Long straddle is an investment strategy which is used when investors anticipate very large movements in stock/index prices. Under this strategy, an investor takes a long position (buying) of slight out-of-the-money call(strike price higher by 1-2 percent of the spot price) and slightin-the-money put(strike price higher by 1-2 percent of the spot price) on the same stock/index at the same maturity and strike price. Investors, using this strategy are directional neutral.

Empirical results regarding the performance inputs of S&P CNX Nifty long straddle reported in Table 1 exhibits that in the majority of whole study period (6 out of 10 years) long straddle investment strategy has produced superior average monthly returns over the risk free rate of return which is measured as return on 364-days treasury bills. In relation to benchmark investment strategy, long straddle investment strategy has generated higher average monthly return in majority of years of whole study period. It is interesting to observe that long straddle strategy has experienced much higher performance (18.88 percent) than the risk free return (0.52 percent) as well as market returns (1.43 percent) measured in terms of average monthly return of whole study period. Short straddle strategy is carried out by holding a short position in both slight out-of-the-money call(strike price higher by 1-2 percent of the spot price) and slight in-the-money put(strike price higher by 1-2 percent of the spot price) that have the same strike price and expiration date. The short straddle is a risky strategy and used by investors only if they believe that stocks' price will not move up or down significantly. Interestingly, this derivative based investment has not reported any negative return in the whole study period. It is worthwhile to mention that even in the year 2008, a witness of global recession, short straddle investment strategy outperforms the spot market strategy (-6.33 per cent) as well as risk free return (0.65 percent) and yielded positive return (29.89 per cent) to the investors. Furthermore, it is noticeable that in terms of average of monthly return of entire study period, short straddle strategy has experienced higher performance (15.94 percent) than the risk free return (0.52 percent) as well as market return (1.43 percent).On the whole, it may be concluded that this derivative instrument proposes better investment avenues than spot market instrument. Commensurate to investment objectives, risk distracts flow of investments with added agility.

Conservatism is embedded in investors' psychological

texture; one is twice engaged to avoid risk than to magnify return. In investment parlance, risk is represented by variability in expected return stream and is better measured by sigma ($_p$). The performance outcomes, emanating from the present study in this regard are reported in Table 2.The performance outputs thus reported reveals long future investment strategy has experienced maximum exodus of variability in investment return(s) during the whole study period. The risk measured by standard deviation of monthly returns was highest (52.50 percent) in 2008, which was a financial turmoil period across the world. It is curious to note that this naked investment strategy was discovered to have experienced larger return variability in all the years and thus were more risky as compared to spot market based investment strategy i.e. buy and hold of CNX Nifty 50 benchmark index. The average risk for the entire study period (33.83 percent) was noted higher than average risk of spot market investment strategy (6.91 percent).

In the case of covered call investment strategy the performance outcomes reported reveal that the investment strategy has underperformed the buy and hold investment strategy in terms of risk as measured by variability of investment returns during the whole study period. In relation to benchmark variability of investment performance obtaining in this regard, minimum variability (9.93 percent) was noted in 2007 and maximum variability (30.93 percent) in 2008. It is significant to note that covered call investment strategy was discovered to have experienced larger average return variability (14.73 percent) over the benchmark portfolio (7.12 percent) during the whole study period and thus was more risky compared to CNX Nifty 50 benchmark index. In simple words, it indicates the greater variability of covered call investment performance in comparison to buy and hold investment strategy. The performance outcomes regarding the risk, measured in terms of standard deviation of returns of long straddle strategy emanating from the present paper reveals long straddle investment strategy has experienced higher variability in investment return(s) during the whole study period. The standard deviation of returns of 114 months was highest (154.09 percent) in 2001, which was an initial period of derivative trading in Indian stock market. Furthermore, the straddle investment strategy was discovered to have more return variability than investment in Nifty spot portfolio during whole study period. The average standard deviation for the whole study period (92.85 percent) was noted higher than average risk of spot market investment strategy (7.12 percent).

Consequently, greater variability is embedded in the performance of long straddle investment strategy during the study period which advocates the familiar opinion of volatile nature of derivatives instruments. The empirical results regarding the standard deviation of monthly returns of short straddle exhibit the investment strategy has experienced reasonable exodus of variability in investment return(s) during the whole study period. The risk measured by standard deviation of returns of 114 months was highest (28.68 percent) in 2008 and was lowest (5.31 percent) in 2010.Furthermore, the difference between variability of short straddle and spot market investment strategy was noted to be not as high as in other derivative based investment strategies. The average of risk measured in terms of standard deviation for the whole study period (10.67 percent) was noted higher than average risk of spot market investment strategy (7.12 percent).

Investment Performance Analysis

Since performance measurement portrays investment strategy's success, it is equally important that such performance be measured in an unambiguous manner accep Table to the industry participants and academicians to avoid any confusion or misrepresentation. Though risk - return analysis is an important dimension of investment performance evaluation yet it is not adequate to depict the whole picture of investment performance. Therefore, it is imperative to examine the ex-post investment performance in relation to the theoretical measures to take cognizance of risk and return simultaneously along with the benchmark portfolio return. The essential idea behind this is to compare the returns obtained by derivatives based investment strategy with the returns that could have been obtained for the client if one or more appropriate alternative portfolio (unmanaged portfolio) had been chosen for investment at a given risk level. The reason for this comparison is straight forward being more prudent to evaluate investment performance on relative basis than in terms of either risk or return alone. An investment strategy may generate superior return by exposing investments to a higher risk level than the unmanaged portfolios. It needs to be examined whether the higher risk exposition of investments yielded commensurate return. Therefore, performance evaluation methodology should take cognizance of such vital aspects in its ambit to rate investment performance in the most prudent and unambiguous manner that considers the relative risk level and strength of the market for meaningful investment analysis.

In finance literature, Sharpe Model (1966) is one widely acknowledged risk adjusted performance evaluation measure which considers total risk in the evaluation of investment performance of managed portfolios. The performance outcomes obtaining in this regard are presented in Table 3. The information reported reveals that in the majority of study period (8 years) the naked investment strategy has outperformed the benchmark market proxy (CNX Nifty-50) while in the remaining period (2000, 2002 and 2004) yielded inferior performance in terms of Sharpe measure. It is curious to note that the average Sharpe ratio of naked strategy (0.17) was observed higher than the average of similar measure (0.14) of benchmark portfolio. Empirically, it may be deduced from the results reported above that long future (naked) investment strategy yielded superior performance than the simple buy and hold investment strategy during the whole study period of 11 years. The empirical results regarding the covered call investment strategy depict that this strategy has yielded positive excess return per unit of risk in the majority of whole study period (9 out of 10 years) and similar results were noted (8 out 10 years) regarding spot market based investment strategy. In relation to benchmark investment performance obtaining in this regard, minimum investment performance measured in

terms of Sharpe ratio (-0.06) was noted in 2008 and maximum performance (1.41 percent) in 2008. It is worthwhile to observe that covered call investment strategy was discovered to have experienced better average investment performance measured in terms of Sharpe ratio (0.69) over the same of buy and hold investment strategy (0.19) during the whole study period.

The performance outcomes of Sharpe measure regarding long straddle investment strategy indicate that in the half of the study period (5 out of 10 years) the long straddle investment strategy has performed better than the buy and hold strategy of CNX Nifty-50 spot portfolio. Furthermore, the average Sharpe ratio of straddle strategy (0.10) was observed lower than the average of similar ratio (0.19) of benchmark portfolio. On the whole, it may be deduced from the empirical evidences reported that long straddle investment strategy is enable to deliver superior performance than the simple buy and hold investment strategy during the whole study period of 10 years. The information inputs regarding risk adjusted performance of short straddle investment strategy reveal that in all the years of study period the short straddle investment strategy has yielded superior performance over the benchmark market proxy (CNX Nifty-50) in terms of Sharpe measure. Nevertheless, the average risk adjusted performance of short straddle strategy (1.63) was observed higher than the average of similar measure (0.19) of benchmark portfolio. Overall, the results reported above indicate the superior performance of short straddle investment strategy compared to investment in cash portfolio of CNX Nifty.

ONCLUSIONS

Empirical literature on finance indicates numerous investment strategies based on fundamental factors such as price-earnings ratio, book to market ratio, size effect, value premium etc. to magnify the returns of investor in investment jargon. In the present paper an attempt has been made to examine the profitability associated with derivatives based investment strategies i.e. Long Future (Naked), Covered Call, Long Straddle, Short Straddle in Indian capital market during the period of June 2000 to December 2010. The results reported in the paper have important bearing for the investment decision making. It is significant to note that average monthly returns of all the four investment strategies studied for the whole study period were noted higher than the average riskless return and benchmark index. The empirical results have also exhibited that the long straddle investment strategy scored highest average monthly return (18.88 percent) among all the derivative investment strategies and long future (naked) investment strategy delivered lowest average monthly performance (4.63 percent) in this regard. On the other hand, the present paper reveals none of the strategies generated lower variability of returns than the market portfolio i.e. CNX Nifty-50 during the entire study period. It provides credence to the popular perception of higher volatile nature of equity derivative instruments.

The information inputs depict the long straddle investment strategy as highest risky (92.87 percent) investment strategy among all the derivative investment strategies and short straddle investment strategy delivered lowest variability of monthly returns (10.54 percent) in this regard. Thus, on the risk dimension all the examined investment strategies yielded inferior performance to spot market portfolio. The performance outcomes in terms of risk adjusted performance i.e. Sharpe ratio reveals that the majority of investment strategies (3 out of 4) have outperformed the benchmark market proxy. It is curious to note that the average Sharpe ratio of short straddle investment strategy (1.63) was observed highest among all the investment strategies. On the other hand, long straddle emerged as looser investment strategy (0.09) during the whole study period. Thus present paper documents evidences of superior investment performance that could be constructed better than that of the passive benchmark portfolio. On the whole, the paper indicates the ability of the derivative based investment managers to come out fully on the expectations of the investors. Above all, the present paper has also generated results indicating positive risk-return relationship of investment strategies. Such positive relationship indicates the inherent higher volatility of derivative instruments. It is apparent from the results that there is huge gap between the investment performance of simple buy-and-hold investment strategy and derivatives based investment strategies. This gap could be one of the causes of high volatility of Indian equity market as well as large trading in equity derivatives. However, the market regulator has to keep this in consideration while making regulations for this segment of market.

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Table 1: Return of Derivatives based and Spot Market based Investment Strategies

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
	Return	Return	Return	Return	Return	Return	Return	Return	Return	Return	Return	Average
Risk Free Return	0.82	0.66	0.51	0.41	0.41	0.48	0.56	0.63	0.65	0.36	0.5	0.54
Spot Market	-2.05	0.12	0.82	3.62	1.9	2.35	2.7	3.66	-6.33	4.27	1.26	1.12
Long Future	-15.17	-1.19	-0.23	18.64	6.12	14.82	13.52	17.21	-31.37	23.33	5.29	4.63
Covered Call	N.A	1.37	3.39	10.17	8.49	10.59	14.66	11.91	-1.07	18.56	6.83	8.49
Long Straddle	N.A	84.69	5.96	78.95	-3.57	55.64	-17.591	6.27	-12.71	-17.93	9.04	18.88
Short Straddle	N.A	6.49	11.09	6.92	15.9	11.42	8.5	18.2	29.89	27.42	13.55	15.94

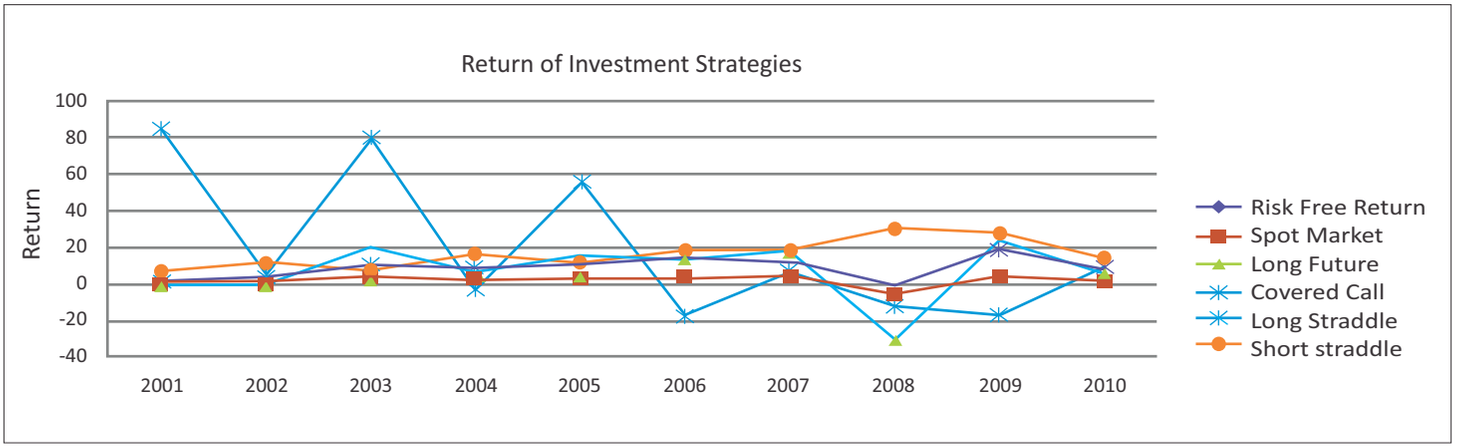

Table 2: Risk of Derivatives based and Spot Market based Investment Strategies

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
	Risk	Risk	Risk	Risk	Risk	Risk	Risk	Risk	Risk	Risk	Risk	Average
Spot Market	7.23	8.87	5.86	6.55	7.17	6.07	5.54	5.73	10.24	7.18	5.55	6.91
Long Future	34.68	39.73	25.2	35.15	30.3	37.54	27.56	26.9	52.5	35.19	27.3	33.83
Covered Call	N.A	23.29	10.84	12.591	13.33	13.3	11.73	9.93	30.93	12.95	58.43	14.73
Long Straddle	N.A	154.09	84.99	28.86	65.57	101.79	44.02	89.45	91.32	60.97	107.39	92.85
Short Straddle	N.A	12.26	8.73	9.48	9.04	6.19	8.3	9.76	28.68	8.91	5.31	10.67

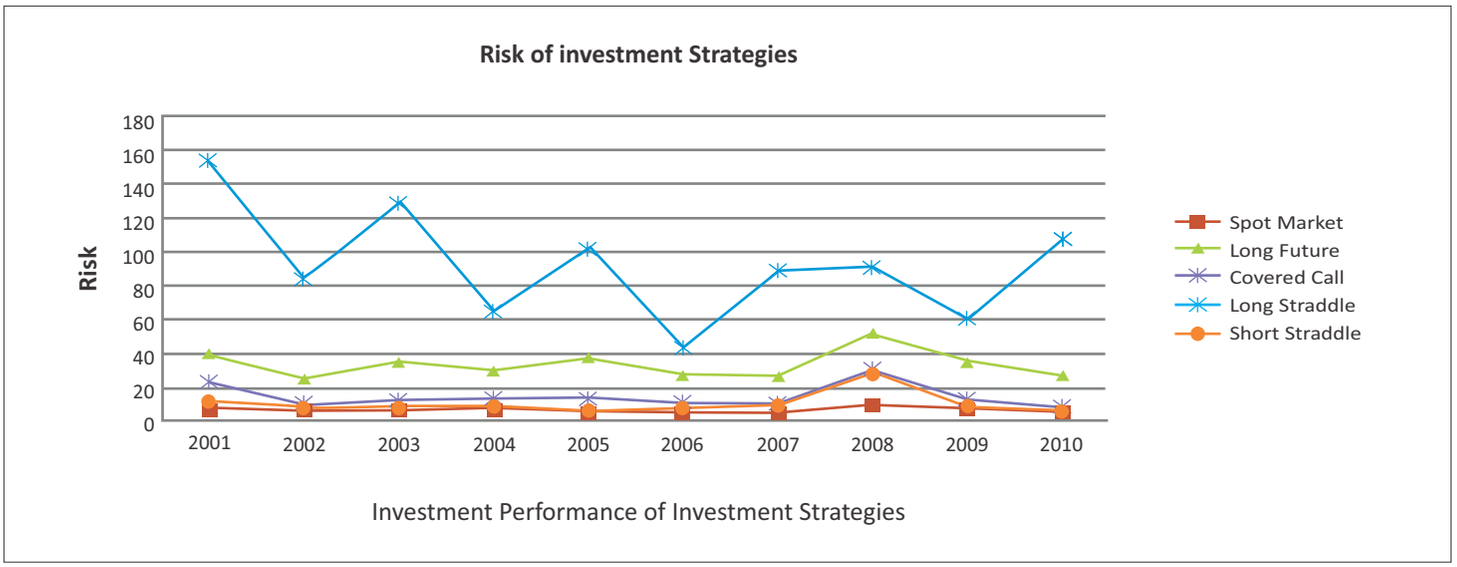

Table 3: Risk adjusted Performance of Derivatives based and Spot Market based Investment Strategies

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
	Sharpe Ratio	Sharpe Ratio	Sharpe Ratio	Sharpe Ratio	Sharpe Ratio	Sharpe Ratio	Sharpe Ratio	Sharpe Ratio	Sharpe Ratio	Sharpe Ratio	Sharpe Ratio	
Spot Market	-0.4	-0.06	0.05	0.49	0.21	0.31	0.39	0.53	-0.68	0.54	0.14	0.14
Long Future	-0.46	-0.05	-0.03	0.52	0.19	0.38	0.47	0.62	-0.61	0.65	0.18	0.17
Covered Call	N.A	0.03	0.27	0.77	0.61	0.76	1.2	1.14	-0.06	1.41	0.75	0.69
Long Straddle	N.A	0.55	0.06	0.61	-0.06	0.54	-0.41	0.06	-0.15	-0.3	0.08	0.1
Short Straddle	N.A	0.48	1.21	0.69h	1.71	1.77	2.16	1.8	1.02	3.04	2.46	1.63