PERFORMANCE ANALYSIS OF VOLATILE STRATEGY UNDER INDIAN OPTIONS MARKET

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ABSTRACT

Options strategies are used to minimize the risk by profiting from either direction of call and put. Traders need to analyse the market to identify a perfect strategy which can stand still in the volatile market. Volatility is the key issue in the market and this formulates new strategy to minimize the risk. Straddle and strangle are best suited volatility strategy as per the options market experts. Hence, a question is raised, which strategy generates higher positive return under volatile conditions. Therefore, a performance analysis is undertaken based on the individual merit and market conditions using Sharpe, Treynor and Jensen's alpha ratios. Daily data is collected from 2010 to 2016 by taking near, next and far month maturity contract of European call and put options. The finding indicates that when uncertainty about the market is more, it is better to take strangle strategy. Hence, the traders have to decide the strategy after analysing the market conditions.

Keywords: Jensen, Sharpe, Straddle, Strangle, Strategy, Treynor.
JEL Classification: D81, G11, G32

Introduction:

After the introduction of derivative products in Indian stock market, hedging has become a primary means of trading for investors. Options, is one such product were by the investors have no obligation to buy or sell the contract. There will be loss of premium if buyer does not exercise his option while the seller has unlimited loss potential if the buyer decides to exercise his right. The calls and the puts are the two types of options. Call options relates to buy the contract and put options to sell the contract. Options strategies are used taking in to account the combination of both call and put. To ensure a certain level of profits, a trader (whether buyer or seller) must use strategies that act as a hedging device to either minimize losses or lock a certain minimum profit. The main parameter which affects the options contract is the volatility. Therefore, in order to stand still in the market, an effective hedging strategy needs to be applied. There are number of trading strategies available but the one which works out in volatile market is straddle and strangle. Straddle strategy is one where traders buy at the money call and put

options with same strike price and expiry period. Initially the investor has to pay premium for both the call and put. Hence, the unlimited loss would be the premium. Normally, new investors used to take such type of strategies as they can concentrate only on single strike price's premium movements. In case of strangle, the traders buy out the money call and put options with same expiry period but different strike prices. Here also the maximum loss is the premium paid. However, high fluctuation in the market leads to greater payoff to these strategies.

This study focuses on the strategy that can be used by investors when the market is highly volatile. Option strategies are mainly used to reduce risk in case of any extreme movements in the market. Hence, an attempt is made to generalize the concept of straddle and strangle with reference to the volatile conditions in National Stock Exchange (NSE) of India. Through the use of option strategies, traders can easily transfer the risk by way of hedging. By locking in-asset prices, the impact of fluctuations in asset prices on the profitability and cash flow situation of risk–averse investors can be minimized. Hence, for this the data is been collected from National Stock Exchange of

India. It demonstrates the European call and put options of Nifty 50 Index options. Based on the strategy strike price is selected. For straddle 8000 and for strangle 8000 and 8600 strike price with same maturity period. Here, near (1 month), next (2 month) and far (3 month) month maturity contract is selected. The strategies formulated here will definitely familiarize the investors regarding the straddle and strangle strategy under volatile market condition and can thus maximize the returns.

The remainder of the paper is organized as follows. Section 2 gives extensive review of literature. Section 3 contains description of data and methodology. The results and discussion have been compressed and summarized through tables and charts in section 4. The final section provides brief summary and conclusion of the study.

Review of Literature:

Several studies compare the performance of pure-stock positions with that of stock positions combined with options, and the performance of different option strategies. (Trennepohl & Dukes, 1981) investigated the performance of option writing and buying strategies using in-the-money (ITM) and out-of-the-money (OTM) options, and found that covered option writing lowers portfolio standard deviation and improves portfolio mean returns. (Bookstaber & Clarke, 1985) compared the performance of protective-put, covered-call, and pure-stock strategies, and found that call writing is better than put buying in terms of expected return and volatility, but that the former truncates the right-hand side of a distribution causing undesirable negative skewness, while put-buying truncates the left-hand side of a distribution causing desirable positive skewness. Some studies show that the performance of option strategies with stock portfolios could depend on other factors or on market conditions. (Benninga & Blume, 1985) analyzed the optimality of portfolio insurance in complete and incomplete markets, and found that buying put option may be optimal only in an incomplete market, not in a complete market. (Brooks & Hand, 1988) examined the return characteristics of index futures contracts, and found that both the return distribution and performance evaluation depend on the risk-free rate, the dividend rate, the basis and the margins. (Castellano & Giacometti, 2001) compared the performance of protective-put and covered-call strategies to the performance of holding an unhedged currency portfolio and found that the option strategies perform better than the optimal naked portfolios and the protective-put strategy performs well for different VaR models. (Isakov & Morard, 2001)investigated the performance of a global investment strategy that combines diversification and option strategies, in particular the covered call strategy, and found that

the use of option strategies consistently improves the performance of stock portfolios, even in the presence of transaction costs.(Brenner, Ou, & Zhang, 2001)indicates that the straddle are very sensitive when comes to changes in volatility. This result into a power instruments in the options market to hedge the volatility spill over. Hence, straddle declares better comparing to other strategies. (Liu & Pan, 2001) describe the risk and return tradeoffs in the stochastic volatility and price jumps through derivatives. It will enable the investors to exploit the time varying opportunity in the stock market. (Abid et al 2006) investigated the performance of option strategies, including writing OTM covered-call and buying ITM protective put, with that of the pure-stock investment, and found that, in general, the buying ITM protective-put strategy has the best performance, followed by the writing OTM covered-call strategy, both out-performing the naked stock.

From the literature it was understood that there is not much studies on volatility strategies i.e. straddle and strangle. Moreover, options strategies in earlier studies shows the movements of in the money and out the money stock prices. For this different strategies is been used to arrive the hedging results. An exact conclusion is not drawn with regard to the performance of each strategy. Hence, the study is designed exclusively for traders who are new to the market. Since volatility is the main cause of tension to the traders in the derivatives markets. Further analyses in the study try to fulfil the undrawn conclusion in the previous research.

Data and Methodology:

Data:
The data set employed in the present study is retrieved from the National Stock Exchange of India (NSE) website. It encompasses the index options of Nifty 50 and the underlying value on a daily basis. The Nifty 50 index is the world's most actively traded derivatives contract, according to a survey titled 'Derivatives Market Survey', conducted by the World Federation of Exchanges (WFE) and International Options Market Association (IOMA) for the year 2015 across diversified product ranges. Based on the information, the data is collected from January 1, 2010 to December 30, 2016. The long straddle and long strangle strategy is applied by taking European call and European put options with near (1 month), next (2 month) and far (3 month) month contract. Hence, the data set is divided into three month contract cycle period. In order to analyse the performance of straddle and strangle strategies, the Sharpe ratio, Jensen's alpha ratio and Treynor ratio are applied. The methodological parts are explained in next section.

Methodology:

Sharpe ratio:

The sharpe ratio is developed by William Sharpe. The objective of the ratio is to measure the risk adjusted performance of the investment. This ratio is used to analyse the performance of the total investment or a single stock. The Sharpe ratio is measured by taking the average return evaluated both from call and put with risk fee rate of return. In all, it measures the return earned in excess of the risk-free rate by the standard deviation in its return over the measurement period. It quantifies the reward per unit of total risk:

$$Sharpe\ Ratio = \frac{R_p - R_F}{\sigma_P}$$

Where, R_p represents the return on strategy over a period, R_F is the risk-free rate and σ_P is the standard deviation of the strategy. A high and positive Sharpe ratio shows a firm's superior risk-adjusted performance, while a low and negative ratio is an indication of unfavourable performance (Sharpe, 1966). The basic purpose of the Sharpe ratio is to allow an investor to analyze how much greater a return he or she is obtaining in relation to the level of additional risk taken to generate that return.

Treynor Ratio:

It is similar to the Sharpe ratio, except it uses the beta instead of the standard deviation.(Treynor, 1965)measures the return earned in excess of a riskless investment per unit of market risk assumed. Here, the market risk is the beta coefficient. But when it comes to negative beta, the result may get influence to unsystematic risk. This is an improvement over the Sharpe as the return coincides with the volatility performance. It quantifies the reward-to-volatility ratio:

$$Treynor\ Ratio = \frac{R_p - R_F}{\beta_P}$$

Where, R_p represents the return on strategy, R_F is the risk-free rate and β_P is the beta of the strategy with market index. The standard deviation of the strategy alone provides incomplete information on prices movements. This creates advantages to Treynor ratio as they evaluate the overall beta coefficient of each strategy. Beta generates the result of covariance of strategy with the market index.

Jensen's Alpha Ratio:

(Jensen, 1968), measures the performance of a fund compared with the actual returns over the period as suggested by the CAPM model. From the level of systematic risk alpha is generated between the excess return and the return actually expected from the portfolio. A positive alpha indicates that the portfolio has outperformed the market, and vice versa. The Jensen's Alpha can be calculated using the following formula:

$$Jensen's\ Alph\ (\alpha) = R_p - (R_F + \beta(R_M - R_F))$$

Where, R_p is the excess returns attained from the strategy, R_F narrates the risk-free rate as per the period defined, β is stock's beta, R_M is the market return of the strategy. $\beta = Cov\ (R_p, R_M)/Var(R_p)$. Here, Cov denotes the covariance and Var as Variance. Alpha ratio not only takes the beta coefficient but also calculate the expected return in a strategy. This makes the ratio better than the other ratios. Using the formulae above results has been generated in the next section.

Results and Discussion:

The descriptive statistics in table 1 represents the closing premium value of European call and put options of Nifty 50 Index options. For the straddle strategy, 8000 strike is been taken and for strangle 8600. The Jarque-Bera test states that the residuals are normally distributed at the 5 per cent significance level. In the entire call options contract high standard deviation is narrated comparing to put options. While forming the strategy, the traders have to see the movements of call and put options in each strike prices. (Stoll, 1969) argues that there is relation between the call and put with regard to the stock price changes. Hence, a granger causality test is formulated to show the cause and effects relationship between the call and put options of each strategy which are narrated in Table 2. Since the period selected for the study describes a bullish approach, the results are designed accordingly. Here, the series are assumed to be stationary. As per the result, it is noted that the spot market has influence in the call and put options contract. Moreover, call contract in strangle is causing effect on the put options of strike price 8000. This shows that strangle strategy is reacting better in the market. It can leads to positive return to the traders. Sometimes, an inverse relation creates efficient strategy in the bullish markets. Therefore, while trading in the options markets investors has to keep on eyes not only in the spot market but also on the call and put simultaneously.

To examine the performance analysis of straddle and strangle strategies, different ratios are calculated by taking one (near), two (next) and three (far) month maturity period. Standard deviation and beta is been calculated to check the volatility trend in the market. This will intend the investor to create an investment decision based on the market situation. An appropriate amount of strategy is to be formed while arriving at the investment decision in stock market especially in options. Firstly, a portfolio returns are calculated

taking the return of call and put options with each strike prices given by:

$$R_m = {P_m}/{P_n} - 1$$

Where, P_m is the present price and P_n is the previous day's price. Based on the straddle strategy, the premium value of call and put options with strike price 8000 is generated under each maturity period. In strangle, call options of strike price 8600 and put options with strike 8000 is taken in to account for the calculation. The risk free rate of return based on the period December, 2015 is 6.52 per cent. Moreover, in order to have a detail evaluation of the market, options are being divided according to the moneyness. This will throw light on the strategies under different market situation. Firstly, in-the-money performance analysis is demonstrated in Table 3 then forwarded with at-the-money and out-the-money in Table 4 and 5 respectively. Since the market move around the volatile scenario, there arises a need to formulate effective strategy. To form a strategy which generates higher return is a difficult one. Hence, both the strategy i.e. straddles and strangles needs to be applied in the market to see which generate good answer. Therefore, the performance of each strategy is tested by using the Sharpe, Jensen alpha and Treynor ratio.

The Sharpe ratio is one of the efficient tools for testing the performance of a portfolio. The closing premium value of European call and put options is taken to form a total investment with 8000 strike price in straddle. While 8000 and 8600 strike prices for strangle strategy. Average return resembles the return from call and put together in same maturity period. Long straddle strategy is applied first, where a trader can make profits even if the market goes in any direction. The deviations of each value is been taken as the average for call and put options. In case of strangle, average deviation was measured with two strike prices. Long strangle is more appealing than the straddle as the investor can make money in either direction of stock. In-the-money scenarios is beneficial for strangle as the investors are taking advantage of two strike prices. Therefore either direction gives better pay off for the strangle strategy. It has been seen that at-the-money is profitable for the straddle as the same strike price generate equal amount of movements. But here, the bullish market has given marks to strangle. Since, the direction may not be equal in all cases. In case of near and far month maturity contract, the standard deviation is high. This gives the advantages to Sharpe ratio in favor of strangle strategy. The prices of strangle moves in an accurate manner which makes the market more efficient. In straddle, the trader catches the profits where the market moves. There is no exact timing as to when the market shift to straddle. Market is subjective and requires timing with regard to buying and selling of stock. Normally, there are three movements for the market i.e. up, down and average

side. While moving in side way direction, it becomes difficult for traders to decide the market structure. Hence, two choices appears, either the trader can hedge the present stock or took a side direction and wait for the further movement of the market. Since the buyers of the options contract have to pay both the premium, the risk is more. Therefore, beta is to be calculated to analyze the systematic risk in the strategy formed.

The return of the portfolio based on the beta is formulated through Treynor ratios. It measures the coefficient of beta in each strategy. An average is been taken to generate the result based on the covariance of call and put options. The result indicates the superiority of strangle strategy by means of beta. Due to negative beta in next and far month, the Treynor comes to negative value which indicates the dull performance of straddle. May be the market may not be efficient for the same type of strike prices. Lack of volatility for straddle strategy creates a negative approach to traders in the market. This may affect to both the call and put options simultaneously. This will continue till the market reach in a definite direction. Hence, the Treynor ratio depicts lesser value, so would be the performance of the strategy. It's all the volatility which decides the market. But Warren Buffet says, volatility is not a true risk. This is just a condition in the market. Present market is now not allowing the straddle strategy to perform well in the market. Next issue arises based on the beta coefficient is that, what would be the expected rate of return apart from the average return. For that Jensen's alpha ratio need to be calculated. Jensen's alpha ratio measures the expected return on beta. Other than Sharpe and Treynor, Jensen ratios gives exact result of the portfolio investment based on the beta, risk free rate, expected return in same maturity period. Previously, the Treynor measures the average return from the total period by using beta and risk free rate. Moreover Sharpe use standard deviation for calculating the average return based on the risk free rate. Here, the Jensen's alpha analyze the risk in terms of beta and hence assumes that the strategy is already diversified in nature. While comparing to straddle, strangle looks perfect. In all the cases of straddle, the moneyness seems negative. May be the market going in the side way direction or any particular announcement could have been taken place. Such types of reaction create advantages to the strangle strategy.

When comes to trading in options markets, investors becomes confused while selecting appropriate strategy. New trader will normally choose straddle as it comes under same strike price. But based on the market scenario strangle will also perform better from the results of Shape, Treynor and Jensen's alpha ratios. It is the volatility who decides the strategy. Hence, based on the market conditions a trader has to decide which strategy is better. Hence, it is advice to

change the strategy according to the beta level and by constant watch on the movements of stock. Beta plays a significant role on analyzing the risk structure of the market. These ratios will definitely help the traders to rank the performance of any strategy which they considered better for trading in the options markets.

Summary and Conclusion:

The strategies are designed in the options markets to indulge the traders in hedging activity. This can emphasis the return and provides immense knowledge about the movements of stock prices. Therefore, traders need to get some idea while trading in the market especially in options. In order to minimize risk in the stock markets, a certain kind of strategy is formed. Some of them is been discussed in the study i.e. straddle and strangle strategy. These are effectively utilized in the volatility constraints. Hence, for the study data is been collected from National Stock Exchange of India website. The long straddle and long strangle strategy is applied by taking European call and European put options with near (1 month), next (2 month) and far (3 month) month contract. Here, the data set is divided into three month contract cycle period.

Firstly, descriptive statistics is discussed where it shows that the data are normally distributed to arrive at the results. Before forming a strategy, a trader has to get information about the cause and effect relationship between the call and put with spot market. It will help the traders to design the strategy and maximize the return. The results shows that the strangle strategy is reacting better in the bullish market. Later on, a performance evaluation is done by taking in-the-money, at-the-money and out-the-money scenarios to generate the maximum return from each strategy. For this, Sharpe, Treynor and Jensen's alpha ratios are tested. These are efficient ratios to examine the performance of portfolios as a whole. Strategies formed for the analysis shows that the returns are varying in nature as per the maturity period. In Sharpe and Treynor ratio, strangle strategy generate higher return. But in Jensen's alpha, strangle indicates some negative return in next month maturity cycle. In all other months, strangle performed better. Hence, the traders have to decide the strategy after analysing the market conditions. Since volatility is the key factor for the movement of stock prices. Therefore, it is advice to change the strategy according to the beta level and by constant watch on the movements of stock. Since the period selected for the study shows a bullish nature, the results are pertained according to it. Further research can be done with other strategies also.

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Table1: Summary Statistics of European Call and Put Options under different maturity period

Statistics	Strike price @ 8000						Strike price @ 8600			Spot Index
	Call 1	Call 2	Call 3	Put 1	Put 2	Put 3	Call 4	Call 5	Call 6	
Mean	441.4554	517.5527	496.2311	49.60569	86.62129	111.7243	54.20421	100.2295	143.8433	8067.989
Median	408.5750	475.2750	440.6837	11.42500	48.95000	76.57500	1.825000	30.05000	65.45000	8109.725
Maximum	1046.200	1108.400	1085.270	452.4000	478.5500	480.3500	390.3000	453.5000	499.4000	8952.500
Minimum	0.050000	94.65000	11.58341	0.050000	8.050000	20.65000	0.050000	1.100000	3.600000	6970.600
Std. Dev.	257.1432	243.8301	266.8850	80.88149	92.23688	92.64008	87.03219	118.3525	142.2084	546.0587
Skewness	0.230960	0.306318	0.284901	2.441398	1.834496	1.571954	1.753492	1.003747	0.782029	-0.180169
Kurtosis	2.196107	2.220450	2.201967	9.110891	5.999253	5.035876	5.372035	2.798147	2.196170	1.773000
Jarque-Bera	7.235087	8.273751	7.853901	514.9712	189.0132	118.0770	150.8728	34.26237	26.02787	13.76438
Probability	0.056849	0.065973	0.058935	0.983810	0.829492	0.659261	0.201732	0.071839	0.051964	0.090260

Note: Call and Put 1, 2 and 3 is denoted as near, next and far month maturity contract of the strike price 8000. For the strike price 8600 another set of call 4, 5 and 6 is been demonstrated. Since the p-value is greater than 5 per cent, the series are said to be normally distributed.

Table 2: Summary of Granger Causality Tests

Null Hypothesis	F-Stat	Prob.	Null Hypothesis	F-Statistic	Prob.
Put 1 does not Granger Cause Call 1	1.39849	0.2480	Put 1 does not Granger Cause Call 4	0.59684	0.5516
Call 1 does not Granger Cause Put 1	0.66894	0.5127	Call 4 does not Granger Cause Put 1	10.5648	0.0005*
Put 2 does not Granger Cause Call 2	0.86224	0.4229	Put 2 does not Granger Cause Call 5	0.09291	0.9113
Call 2 does not Granger Cause Put 2	0.47977	0.6192	Call 5 does not Granger Cause Put 2	5.08044	0.0071*
Put 3 does not Granger Cause Call 3	1.00781	0.3658	Put 3 does not Granger Cause Call 6	1.29016	0.2776
Call 3 does not Granger Cause Put 3	0.69000	0.5021	Call 6 does not Granger Cause Put 3	4.78525	0.0094*
Spot does not Granger Cause Call 1	3.36345	0.0366*	Spot does not Granger Cause Call 4	2.18697	0.1150
Call 1 does not Granger Cause Spot	0.61072	0.5440	Call 4 does not Granger Cause Spot	0.47753	0.6210
Spot does not Granger Cause Call 2	3.46095	0.0333*	Spot does not Granger Cause Call 5	2.03270	0.1337
Call 2 does not Granger Cause Spot	0.64842	0.5240	Call 5 does not Granger Cause Spot	0.18092	0.8346
Spot does not Granger Cause Call 3	2.76256	0.0656**	Spot does not Granger Cause Call 6	2.07107	0.1288
Call 3 does not Granger Cause Spot	0.35764	0.6998	Call 6 does not Granger Cause Spot	0.32521	0.7228
Spot does not Granger Cause Put 1	1.95517	0.1443	-	-	-
Put 1 does not Granger Cause Spot	0.62489	0.5364	-	-	-
Spot does not Granger Cause Put 2	2.15290	0.1189	-	-	-
Put 2 does not Granger Cause Spot	0.65455	0.5208	-	-	-
Spot does not Granger Cause Put 3	2.39924	0.0935**	-	-	-
Put 3 does not Granger Cause Spot	0.66344	0.5162	-	-	-

Note: * and **denotes rejection of hypothesis at 5 and 10 per cent significance level. Straddle is formed by taking the call and put value of the strike price 8000. While in strangle, call value is taken from the strike price 8600 and put at strike 8000 is selected.

Table 3: Performance of In-the-Money Volatile Strategies under different maturity period

Maturity	Strategy		Sharpe Ratio	Treynor Ratio	Jensen alpha Ratio
Near Month	Straddle	Call 1and Put 1 @ 8000	0.0825	0.0871	-0.3998
		Call 2 and Put 2 @ 8000	0.0648	0.0744	-0.4722
		Call 3and Put 3 @ 8000	0.0992	0.0600	-0.3868
	Strangle	Call 4 @ 8600and Put 1 @ 8000	0.1090	0.6457	0.0740
		Call 5 @ 8600and Put 2 @ 8000	0.1285	0.5574	0.0855
		Call 6 @ 8600and Put 3 @ 8000	0.1150	0.7911	0.7491
Next Month	Straddle	Call 1and Put 1 @ 8000	0.0409	-0.0408	0.1788
		Call 2 and Put 2 @ 8000	0.0390	-0.0369	0.2741
		Call 3and Put 3 @ 8000	0.0683	-0.0499	0.1859
	Strangle	Call 4 @ 8600and Put 1 @ 8000	0.6694	0.0675	-0.1254
		Call 5 @ 8600and Put 2 @ 8000	0.8531	0.0833	-0.1048
		Call 6 @ 8600and Put 3 @ 8000	0.9405	0.0942	-0.1174
Far Month	Straddle	Call 1and Put 1 @ 8000	0.0327	-0.0425	-0.0755
		Call 2 and Put 2 @ 8000	0.0249	-0.0339	-0.0683
		Call 3and Put 3 @ 8000	0.0593	-0.5825	-0.0554
	Strangle	Call 4 @ 8600and Put 1 @ 8000	0.0465	0.4209	0.0052
		Call 5 @ 8600and Put 2 @ 8000	0.0664	0.6932	0.0073
		Call 6 @ 8600and Put 3 @ 8000	0.0739	0.5776	0.0068

Note: Average return and standard deviation counts from the total return of call and put options with strike price 8000 in straddle and with 8600 in strangle. Risk free rate of return is taken as the Indian government 10 year Bond rate i.e. 6.52 per cent.

Table 4: Performance of At-the-Money Volatile Strategies under different maturity period

Maturity	Strategy		Sharpe Ratio	Treynor Ratio	Jensen alpha Ratio
Near Month	Straddle	Call 1and Put 1 @ 8000	0.9056	0.0940	0.0659
		Call 2 and Put 2 @ 8000	0.8051	0.1021	0.0573
		Call 3and Put 3 @ 8000	0.9537	0.1089	0.0521
	Strangle	Call 4 @ 8600and Put 1 @ 8000	1.0672	0.9110	-0.0390
		Call 5 @ 8600and Put 2 @ 8000	1.0431	0.9037	-0.0226
		Call 6 @ 8600and Put 3 @ 8000	1.0529	0.8947	-0.0383
Next Month	Straddle	Call 1and Put 1 @ 8000	0.5598	0.0781	0.0299
		Call 2 and Put 2 @ 8000	0.6392	0.0848	0.0352
		Call 3and Put 3 @ 8000	0.5880	0.0972	0.0267
	Strangle	Call 4 @ 8600and Put 1 @ 8000	0.9950	0.0386	0.0448
		Call 5 @ 8600and Put 2 @ 8000	0.9367	0.0211	0.0574
		Call 6 @ 8600and Put 3 @ 8000	0.8512	0.0482	0.0460
Far Month	Straddle	Call 1and Put 1 @ 8000	0.5960	-0.0102	-0.0104
		Call 2 and Put 2 @ 8000	0.6935	-0.0332	-0.0117
		Call 3and Put 3 @ 8000	0.6229	-0.0514	-0.0148
	Strangle	Call 4 @ 8600and Put 1 @ 8000	0.7930	0.8626	0.0392
		Call 5 @ 8600and Put 2 @ 8000	0.8945	0.8093	0.0446
		Call 6 @ 8600and Put 3 @ 8000	0.8351	0.7958	0.0361

Note: Average return and standard deviation counts from the total return of call and put options with strike price 8000 in straddle and with 8600 in strangle. Risk free rate of return is taken as the Indian government 10 year Bond rate i.e. 6.52 per cent.

Table 5: Performance of Out-the-Money Volatile Strategies under different maturity period

Maturity	Strategy		Sharpe Ratio	Treynor Ratio	Jensen alpha Ratio
Near Month	Straddle	Call 1and Put 1 @ 8000	0.0747	0.0433	-0.0623
		Call 2 and Put 2 @ 8000	0.0953	0.0409	-0.0577
		Call 3and Put 3 @ 8000	0.0885	0.0361	-0.0609
	Strangle	Call 4 @ 8600and Put 1 @ 8000	0.1001	0.2741	0.0990
		Call 5 @ 8600and Put 2 @ 8000	0.1051	0.1845	0.1010
		Call 6 @ 8600and Put 3 @ 8000	0.1029	0.2005	0.0989
Next Month	Straddle	Call 1and Put 1 @ 8000	0.0067	-0.0053	0.0176
		Call 2 and Put 2 @ 8000	0.0031	-0.0037	0.0159
		Call 3and Put 3 @ 8000	0.0052	-0.0048	0.0117
	Strangle	Call 4 @ 8600and Put 1 @ 8000	0.0759	0.0390	0.0846
		Call 5 @ 8600and Put 2 @ 8000	0.0692	0.0442	0.0809
		Call 6 @ 8600and Put 3 @ 8000	0.0847	0.0529	0.0947
Far Month	Straddle	Call 1and Put 1 @ 8000	0.0173	-0.0051	-0.0109
		Call 2 and Put 2 @ 8000	0.0149	-0.0100	-0.0113
		Call 3and Put 3 @ 8000	0.0163	-0.0121	-0.0121
	Strangle	Call 4 @ 8600and Put 1 @ 8000	0.0995	0.0836	0.0308
		Call 5 @ 8600and Put 2 @ 8000	0.0951	0.0932	0.0442
		Call 6 @ 8600and Put 3 @ 8000	0.0892	0.0883	0.0510

Note: Average return and standard deviation counts from the total return of call and put options with strike price 8000 in straddle and with 8600 in strangle. Risk free rate of return is taken as the Indian government 10 year Bond rate i.e. 6.52 per cent.

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