

Iron Butterfly and Iron Condor Option Strategies on Indian Banking Sector

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ABSTRACT: The aim of this paper is to test the returns an individual investor would make by investing in two different option spread strategies namely, Iron Butterfly and Iron Condor strategy on the Indian Banking sector stocks. The option contract chain for the top 3 listed banks based on the market capitalization is considered for the month of December 2018 to design the strategies and the returns were calculated using the stock information on maturity. The paper also accommodates the possible returns that the investor would have made had the all the call options been exercised and had all the put options been exercised by assuming the spot rate higher and lower than the maturity spot rate respectively. The returns obtained from both the strategies under these circumstances are checked for equality on individual bank stocks by interpreting the results for a hypothesis test concerning the equality of the population means of two approximately normal distributed populations. The equality of returns from both strategies varies for different banks in different circumstances which forms the conclusion of the presented paper.

KEYWORDS: Option Strategies, Iron Butterfly, Iron Condor, Banking Sector Options, Equality Test.

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I. INTRODUCTION

The derivative market today is a wide area of interest in the world of finance and it involves various instruments such as futures, options, swaps etc. In India, these are traded in the exchanges namely BSE, NSE and other regional stock exchanges. Commencing from July 12, 2000, the National Stock Exchange started trading in the derivative market. In the last financial year 2017-18, about 12.64 stock option contracts were traded with a turnover of Rs.1.48 Lakh Crores. An options contract is a type of a derivative instrument which like other derivatives, derives its value from the underlying asset, which can be either a share, commodity or currency. It is a contract that gives a right to the buyer of the contract but not an obligation to buy or sell an underlying asset at a specific price and at a pre-determined time. Over the years, options have been referred to as legal gambling instruments which allow traders to take high position with small investments. Options are the instruments which allow people to bet on the underlying asset using with a speculative mindset and least investment. These are also one of the renowned and cost-effective risk management financial instruments. Predominantly, there are two different type of options, put option and call option. A trader who is bullish will lean towards a call option whereas a trader who is bearish will lean towards a put option. In the changing circumstances, a trader might have mixed opinion on the volatility and movement of the price of the underlying asset. In such cases the trader would consider entering into both call and put options in different proportions at different exercise prices to form option strategies. Most popular option strategies in order of their simplicity are straddle, strip, strap, strangle, call spread, put spread, butterfly and condor. A butterfly option strategy can be created with call or put options which involves three different strike prices. A condor is a non-directional strategy with two different types, long and short condor, with long condor benefitting from low volatility and short condor benefitting from high volatility involving 4 different strike prices. An iron butterfly strategy refers to buying and keeping four different options at three different strike prices, whereas an iron condor strategy is created using four different options by taking into consideration the market price of the underlying asset. The analysis done in this study highlights the appropriateness of the above-mentioned strategies for the investors in terms of percentage of returns an individual would make by using these strategies on the Indian banking sector stocks.

II. REVIEW OF LITERATURE

1. Analysis of option trading strategies as an effective financial engineering tool.(S & Duraipandian, 2014)

Option trading strategies involves the application of various mathematical skills to assess and find the solution to financial problems. Its uses various combination from sector to sector. These strategies can be applied in various fields such as investment banking, insurance etc. to hedge the risk as well as to come up with new profit earning strategies. This article exposes us to various option strategies which can be applied in both types of markets, bullish and bearish. It also highlights that how financial engineering is a must in the options and derivative markets. For financial engineering to be termed as successful, it should be able to reduce cost or satisfy the needs of various investors in the financial system. Financial gearing provides a platform to companies to address the needs of various investors and to reduce the overall cost of capital.

2. A study on “Optimizing returns through developing effective option trading strategy: With reference to stock options traded in national stock exchange.” (S & Duraipandian, 2017)

Option strategies are risk management tools which are used around the world and offers a right and not an obligation in regard to trading of specific underlying assets. For the option holder to get this right, he has to pay a certain amount of premium which is an expense to the option holder and a source of income to the option writer. Hence, the option traders must be quite diligent in setting the premium price as it could be reduced to a certain extent by effectively applying the option strategies. This research study assesses the returns of the option traders using four different option trading strategies with the help of two most actively traded index options and the 50 most common actively traded individual stock options contracts to determine the returns of those stocks and the premium payout each one possess thereby concluding on the final return of the option traders.

3. A study of derivative trading strategies in the Indian stock market.(Asani, 2006)

The focus of this study is to understand the famous trading strategies exercised by analysts, factors utilized for the construction and design and the effectiveness of these strategies in comparison to real time traded options. The study tells as to how the options are to be designed theoretically and the examination of their structure in the Indian markets. Despite the increase in popularity of option trading in the Indian derivative market, many variables are still unexplored as far as some important derivative trading strategies are concerned. When compared to the international markets like US, the use of options in India is at a very low level. Hence with the exploration of various option strategies the picture of Indian derivative market can be changed in a positive way. Moreover, the research explains many new variables like advance decline ratio, volatility index, etc. which provide a deeper a deeper insight in forming new option strategies.

4. The performance of model based option trading strategies.(Eraker, 2003)

This paper suggests an alternative to quantify risks and the expected profits of option strategies. Taking the S&P 500 index options it studies the hedge function of portfolios to assess risk of price estimation. The focus is to evaluate different pricing errors while exercising options by performing simulated trading strategies. These errors are extracted by measuring the deviations between market and model prices. It also describes a scheme for the construction of option portfolios which minimize risks and maximize returns by taking variables such as stock price volatility in consideration. It gives knowledge about how various ratios like Sharpe's ratio and Bayesian predictive densities are used to reduce the risk of estimation uncertainty. Finally, this paper proposes an optimal scheme for maximizing the expected profits with minimizing the inherent risk in simulating prices for the options market.

5. Individual investors option trading: Attention Grabbing vs Long term Strategies.(Beuselinck, Heyman, & Pronk, 2010)

This research studies the background of trading records of retail bank investors who trade online to check whether attention – type or sentiment-based events have an upper hand over return feedback strategies in analyzing the investor stock option trading strategies. It gives an insight into the dynamics of an investor's option trading strategies and the various biases they have towards them. It also studies that after the recent various financial crisis around the world individual investors are more in favor of leverage returns by trading in derivative instruments, one of the common ones being the stock options. In order to arrive at the objective of the research, the researcher uses the dataset of two lakhs option trades executed by more 2200 investors. These research findings are of utmost relevance in various fields such as economics, behavioral finance, psychology and other fields in general. These findings also benefit the policy makers and NGOs if they would prefer to inform the investors about the consequences of biasness they have regarding various strategies.

III. RESEARCH DESIGN

Scope of the Study:The Study is based on the top 3 listed banks from the Indian Banking sector based on the market capitalization in the month of Dec 2018, which are as follows:

1. ICICI Bank,
2. Kotak Mahindra Bank and
3. HDFC Bank.

One-month options have been considered for all the selected banks with contract start date of December 3, 2018 and contract maturity date of December 27, 2018.

Source of Data:The study is based on secondary data that is taken from the NSE website under the option chain column for the month of December 2018 for all three banks.

Objective: To ascertain whether the Iron Butterfly and Iron Condor option strategies give equivalent average returns on the top 3 banks from the Indian banking sector.

Hypothesis:

$\mu 1$ = Mean of percentage returns from Iron Butterfly Strategy

$\mu 2$ = Mean of percentage returns from Iron Condor Strategy.

Null Hypothesis-the mean of percentage return from Iron Butterfly strategy is equal to mean of percentage return from Iron Condor strategy:

Ho: $\mu 1 = \mu 2$

Alternate Hypothesis, -the mean of percentage return from Iron Butterfly strategy is not equal to mean of percentage return from Iron Condor strategy:

Ha: $\mu 1 \neq \mu 2$

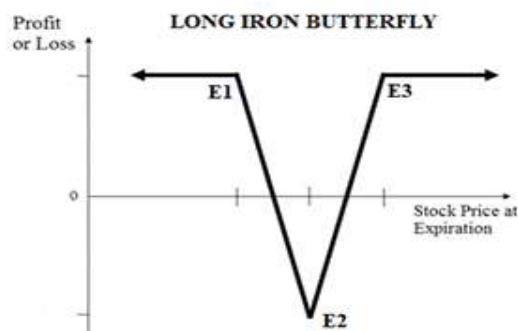
Data Analysis Tool: Microsoft Excel.

Limitations of the Study:

1. The study restricts the data to a limited period which is 1-month options for the month of December 2018.
2. The study assumes that the investor has a volatile belief on the banking stocks and hence only long strategies are considered.
3. Only top three banks have been considered as a representation of the banking industry.

Method of Analysis:

The option chain for the month of December 2018 was used to create an Iron Butterfly strategy and an Iron Condor strategy on a daily basis(excluding weekends) and held till maturity to honor these options.

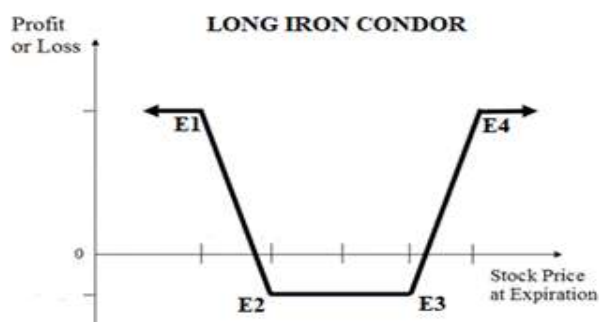


This strategy is designed as follows:

E1 = Sell Put Option.

E2 = Buy Put Option and Buy Call Option.

E3 = Sell Call Option.



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E1 = Sell Put Option.

E2 = Buy Put Option.

E3 = Buy Call Option.

E4 = Sell Call Option.

The return on these strategies is calculated using the stock price on maturity i.e., on December 27, 2018 for all the three banks. The percentage return is calculated by dividing the profit/loss by the net premium paid. In addition to using the actual stock price on maturity the study also considers two hypothetical prices, one where all the call options get exercised and another where all the put options get exercised. The percentage return is calculated similarly as mentioned above.

These returns under the actual and the two hypothetical situations are then tested for equality between the iron butterfly and iron condor strategy, as per the established hypothesis. The hypothesis test is conducted using T tables as the sample size for each bank is 18 strategies which is less than the standard sample size of 30. (18 days of trading between the contract start and maturity date). The t values are calculated as follows.

ICICI Bank

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

Where, x_1 = Average return of ICICI Bank using the Iron Butterfly Strategy.

x_2 = Average return of ICICI Bank using the Iron Condor Strategy.

S_1^2 = Variance of the returns of ICICI Bank using the Iron Butterfly Strategy.

S_2^2 = Variance of the returns of ICICI Bank using the Iron Condor Strategy.

$N_1 = N_2 = 18$, N_1 and N_2 are sample sizes.

Kotak Mahindra Bank:

$$t = \frac{\bar{y}_1 - \bar{y}_2}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

Where, y_1 = Average return of Kotak Mahindra Bank using the Iron Butterfly Strategy.

y_2 = Average return of Kotak Mahindra Bank using the Iron Condor Strategy.

S_1^2 = Variance of the returns of Kotak Mahindra Bank using the Iron Butterfly Strategy.

S_2^2 = Variance of the returns of Kotak Mahindra Bank using the Iron Condor Strategy.

$N_1 = N_2 = 18$, N_1 and N_2 are sample sizes.

HDFC Bank:

$$t = \frac{\bar{z}_1 - \bar{z}_2}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

Where, z_1 = Average return of HDFC Bank using the Iron Butterfly Strategy.

z_2 = Average return of HDFC Bank using the Iron Condor Strategy.

S_1^2 = Variance of the returns of HDFC Bank using the Iron Butterfly Strategy.

S_2^2 = Variance of the returns of HDFC Bank using the Iron Condor Strategy.

$N_1 = N_2 = 18$, N_1 and N_2 are sample sizes.

The T distribution table is then used to check the equality of returns at 95% level of confidence i.e. 5% significant level of error which makes it a two tailed test. If the probability of t value is less than 0.05 then we would reject the null hypothesis. The null hypothesis would fail to get rejected when the probability of t value is more than 0.05.

IV. DATA ANALYSIS AND INTERPRETATION

As described in the method of analysis above, below is the table representing the mean of percentage returns from different banks for both strategies in under the 3 different scenarios:

Mean and variance with actual spot prices:

Bank	Strategy	Mean (%)	Variance
ICICI	Iron Butterfly	-33.29	0.1664
ICICI	Iron Condor	-68.37	0.3815
Kotak Mahindra	Iron Butterfly	-34.65	0.2551
Kotak Mahindra	Iron Condor	-76.45	0.2897
HDFC	Iron Butterfly	-9.36	0.3165
HDFC	Iron Condor	-61.03	0.2612

Mean and variance with spot price higher than actual spot prices:

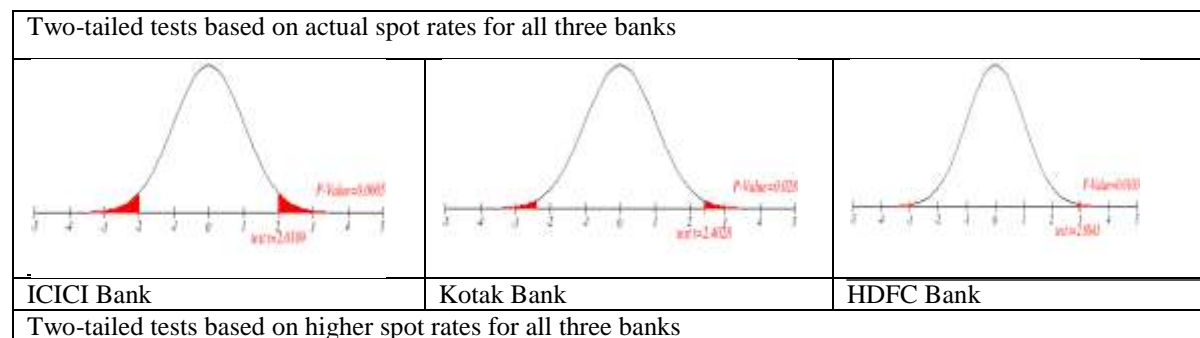
Bank	Strategy	Mean	Variance
ICICI	Iron Butterfly	41.01	0.0165
ICICI	Iron Condor	89.76	1.3275
Kotak Mahindra	Iron Butterfly	4.41	0.0035
Kotak Mahindra	Iron Condor	33.19	0.2921
HDFC	Iron Butterfly	41.81	0.0981
HDFC	Iron Condor	58.10	0.1951

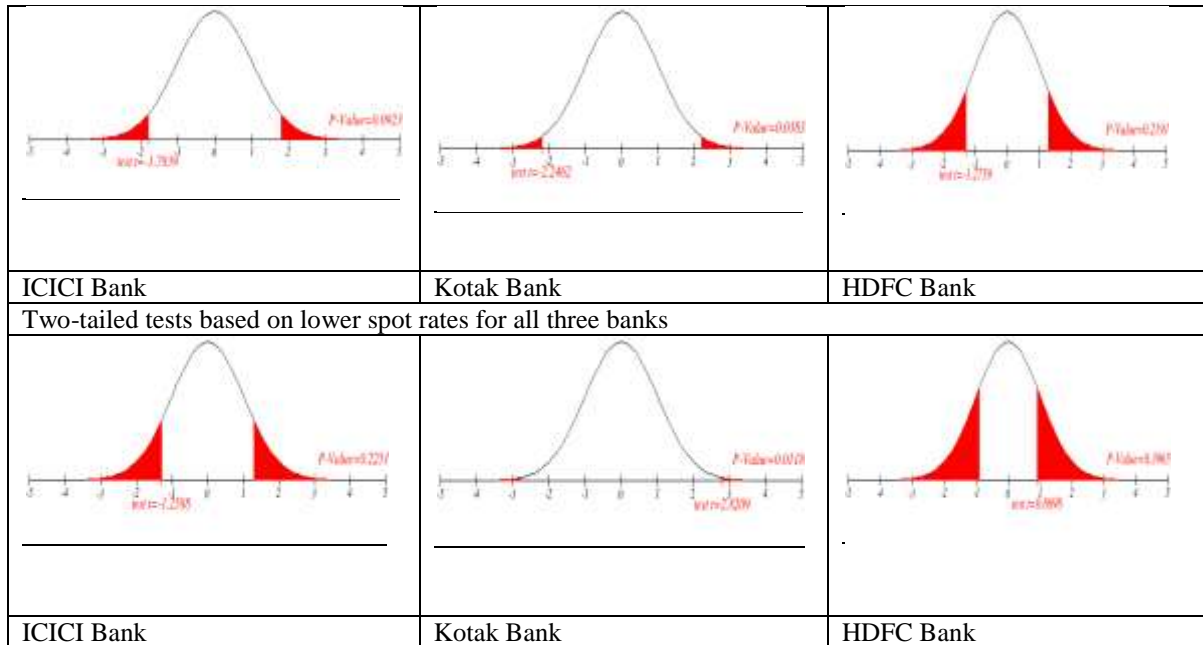
Mean and variance with spot price lower than actual spot prices:

Bank	Strategy	Mean (%)	Variance
ICICI	Iron Butterfly	31.23	0.1529
ICICI	Iron Condor	71.67	1.7050
Kotak Mahindra	Iron Butterfly	-16.97	0.1974
Kotak Mahindra	Iron Condor	-65.51	0.3357
HDFC	Iron Butterfly	-6.52	0.1487
HDFC	Iron Condor	-26.73	0.8232

t-values calculated based on the formula mentioned in method of analysis above:

Scenario	ICICI t- value	Kotak Mahindra t- value	HDFC t- value
When actual spot rates are considered	2.0109	2.4028	2.8843
When higher spot rates are considered	-1.7839	-2.2462	-1.2759
When lower spot rates are considered	-1.2588	2.8209	0.8698





V. RESEARCH FINDINGS AND SUGGESTIONS

Based on the above hypothesis testing, following are the findings.

Actual Spot Prices:

Bank	Test Results	Null Hypothesis
ICICI	P > 0.05	Failed to reject
Kotak Mahindra	P < 0.05	Rejected
HDFC	P < 0.05	Rejected

Higher Spot price than Actual:

Bank	Test Results	Null Hypothesis
ICICI	P > 0.05	Failed to reject
Kotak Mahindra	P < 0.05	Rejected
HDFC	P > 0.05	Failed to reject

Lower Spot price than Actual:

Bank	Test Results	Null Hypothesis
ICICI	P > 0.05	Failed to reject
Kotak Mahindra	P < 0.05	Rejected
HDFC	P > 0.05	Failed to reject

Based on the above results and study of the option strategies, it can be found that the mean percentage returns for ICICI bank when taken with actual spot prices using both Iron Butterfly and Iron Condor strategies are equivalent as the test fails to reject the null hypothesis. Conversely, for Kotak Mahindra Bank, the mean percentage returns when taken with actual spot prices using the same strategies are different as the tests reject the null hypothesis. Similar is the case with HDFC Bank. With reference to the assumed spot prices higher than the actual spot prices, i.e. when all the call options get exercised, the mean percentage returns for ICICI Bank using the above-mentioned strategies are equivalent as the test fails to reject the null hypothesis. Similar is the case with HDFC Bank. In contrast, the mean percentage returns for Kotak Mahindra Bank with reference to the same scenario are different as the test rejects the null hypothesis. In the third scenario, when the returns were measured considering the assumed spot prices lower than the actual spot prices, i.e. all puts getting exercised, the mean percentage returns for HDFC Bank using the two strategies are equivalent. Similar is the case for ICICI Bank. However, the mean percentage returns for Kotak Mahindra Bank in the same scenario are different as the test rejects the null hypothesis.

Suggestion:

In cases where both the strategies give different mean percentage return, the investor would be suggested to choose the strategy that gives highest mean percentage return. In cases where the option strategies on the specific banks give same mean percentage return, the investor would can select either of the strategies.

However, the decision in this case might be influenced based on the cost of each strategy and the investor's capacity to invest and willingness to hold the options till maturity.

VI. CONCLUSION

Based on the data analysis and findings, it can be concluded that in case of few banks the iron butterfly strategy and iron condor strategy can give same mean percentage return to an investor who would enter into these strategies on a daily basis till maturity and different results in case of others. The results of equality of mean percentage return between these strategies varies in circumstances where the stock price turns out to be relatively greater than the actual spot price on maturity, where all call options get exercised. The same holds good when the stock price turns out to be relatively lower than the actual spot price on maturity, where all put options get exercised. It can be concluded, that the investor needs to look into cost of each strategy and his/her monetary constraints to select the appropriate strategy in cases where both the strategies fetch same percentage of return.

REFERENCES

- [1]. Asani. (2006). A Study of Derivative Trading Strategies in Indian Stock Market. Retrieved from <http://shodhganga.inflibnet.ac.in/bitstream/10603/146490/11/10..chapter 1.pdf>
- [2]. Beuselinck, C., Heyman, D., & Pronk, M. (2010). Individual Investors and Option Trading: Attention Grabbing Versus Long-Term Strategies. SSRN Electronic Journal. <https://doi.org/10.2139/ssrn.1745728>
- [3]. Eraker, B. (2003). The Performance of Model Based Option Trading Strategies. Retrieved from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.199.8904&rep=rep1&type=pdf>
- [4]. S, S. H., & Duraipandian, R. (2014). Analysis of Option Trading Strategies as an Effective Financial Engineering Tool. The International Journal Of Engineering And Science (IJES) ||. Retrieved from www.theijes.com
- [5]. S, S. H., & Duraipandian, R. (2017). A Study on "Optimizing Returns through Developing Effective Option Trading strategy: With Reference to Stock Options Traded in National Stock Exchange," 19, 90–98. <https://doi.org/10.9790/487X-1910019098>
- [6]. https://www.nseindia.com/products/content/derivatives/equities/historical_fo.htm
- [7]. <http://www.imathas.com/stattools/norm.html>
- [8]. <https://www.socscistatistics.com/pvalues/tdistribution.aspx>

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