

Strategy involving Shorting the Straddle in Bank Nifty using the Aroon Indicator

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Abstract— One of the most alluring positions for a derivatives trader is the straddle, whether they are long or short. As per the most recent SEBI India data, the majority of derivative traders are experiencing losses. On indexes like the S&P 500 or Gold, there are some methods that are researched by researchers for identifying strategies that can be used to maximise returns and advance decision-making. Finding the best approach to accurately identify an impending consolidation in an index is the key to the strategy of a short straddle's success. In order to maximise gains, this research paper identifies the precise entry and exit points for executing a short straddle in Bank Nifty index weekly options. The findings of the back testing indicate that the method can be successfully applied to previous signals, demonstrating historical success. This makes the findings important to other traders who might then use this in the market or researchers who could now conduct more research. When trading in the markets, a lot of people want such strategies to implement for consistent returns.

Index Terms— Straddle, Optimize Returns, Entry, Exit, Option Strategy.

I. INTRODUCTION

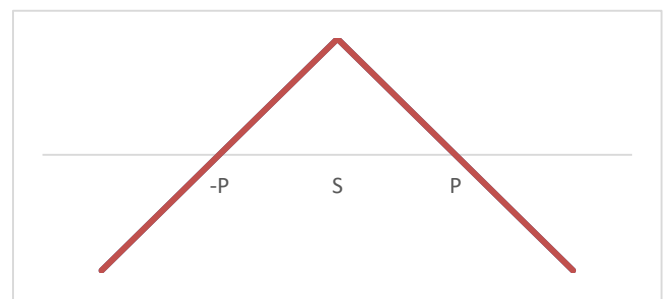
Trading in the derivatives market has fascinated many traders with many not being able to complete sufficient study before taking trades. Some traders believe in fixed strategies that they would do everyday such as the 9:20 straddle, which involves taking a short straddle everyday in the first few minutes of opening of market and either putting individual stop loss on each leg or covering the position at day closing. These strategies have provided returns to some traders but fail to adjust to changing market conditions such as high volatility period or low premium market. Such things bring the need for a strategy that involves selecting the entry and exit points trying to optimize the returns with minimum risk.

Any type of trading in the market involves a risk to return payoff that would let a trader know before hand what is the maximum loss he or she can take and on taking that risk the return potential from the position. Thus the strategy discussed in this research papers involves in setting an entry and exit point for taking short straddle in weekly options. Though the stop loss is not on the basis of premium or absolute amount but on the levels of Bank Nifty or its movement. Maximum possible risk can be estimated from the prior returns which can be expected to continue in the future.

While taking a short straddle the most important aspect to consider is the risk element as you are exposed to undefined risk on either side of the strike price. Apart from this you would gain only if the index closes in the range from (Strike Price – Premium Received) to (Strike Price + Premium Received).

$$\text{Payoff Range} = \{ \text{Strike Price} \\ - \text{Premium Received}, \text{Strike Price} \\ + \text{Premium Received} \}$$

The graph 1 shows the payoff chart for a short straddle taken for the Strike Price (S) with the premiums received as (P) at expiry. Now talking about the most common strategy is the 9:20 Straddle in which traders take a position at or around 9:20 in the morning and cover it by the end of day. Their exit is either to book any profit or loss at day end or put stop loss on each leg individually as to limit loss. However the major problem is that doing this everyday does create problems as markets are different every day or every period. Sometimes they would be very trending or other times stay in a range. Thus you would be bound to take the position even if you are having loss as with a boundness to not miss the profitable days. This creates problems and traders exit at the time when they receive the maximum loss as the market is at most volatility but do not end to see stable days. Hence this brought the need to look for any way to reduce the trading days to a minimum by not trading on days where volatility can be expected to be there.



Graph 1 : Payoff of a short straddle

So traders in the market want to refine the strategy with the motive to reduce their risk of loss without sacrificing much on the potential profits. These strategies are then backtested before implementing to see the returns they would give if they had been implemented in the past and to estimate any future expectations.

II. LITERATURE REVIEW

The aim of this research report is to find any strategy that involves improving the returns in taking a short straddle by reducing the risk in trades. For this we need to identify a way to know when to take a straddle and when to not. Hence we are searching for an indicator that might indicate an upcoming consolidation.

For this report many existing researches have been considered that are based on forming a strategy related to options or taking straddles. Thus looking at them might benefit in understanding the performance, risks, rewards, payoffs and the errors.

Supervised Machine Learning Classification for Short Straddles on the S&P500: The study by Brunhuemer et al. (2022) focuses on forming a short straddle strategy in S&P 500 by using supervised machine learning classification techniques. The authors took the historical data and employ various machine learning techniques to develop a strategy and in the end found a potential to use machine learning in forming such strategies for trading.

Analytic Approximation for American Straddle Options: Goard and AbaOud (2022) provides a way to approximate the pricing of American straddle options. This might benefit in improving the efficiency and accuracy of option pricing methods which can be relevant in implementing the short straddle strategies.

Hedging strategy in emerging market: Application long straddle option in gold price index: Hendrawan et al. (2020) analysed using long straddle to reduce risk from movements in the gold prices. This study analyses historical data and assesses the effectiveness of the long straddle strategy to reduce risks.

Choosing the right options trading strategy: Risk-return Trade-off and Performance in Different Market Conditions: Shivaprasad and Matha (2022) explores the risk reward payoff and performance of various option strategies in different market conditions. The author compares various strategies including straddle for risk profile and their performance with insight into the selection and performance evaluation of options trading strategies and guide traders in implementing the short straddle.

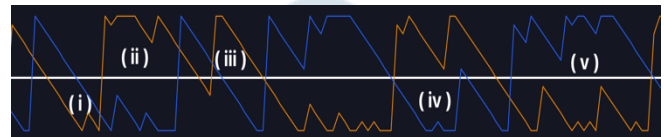
These researches offered various insights into the topic and took various approaches in building a strategy. These findings can be useful in assessing the results from this report and forming a strategy.

III. INDICATOR

Aroon indicator indicates a trend or a consolidation phase by understanding the movement of levels. This comprises of two lines one which shows positive trend while other which shows negative trend in the market.

This indicator can show multiple types of trend and can be understood by movement of the two lines. However we need to understand what those mean before taking the trade based on this.

- i. Weak Positive – Yellow Line rising but below 50 while blue line below 50
- ii. Strong Positive – Yellow Line rising and above 50 while blue line below 50
- iii. Consolidation – When both Yellow Line and Blue Line are falling together.
- iv. Strong Negative – Blue Line rising and above 50 while yellow line below 50
- v. Weak Negative – Blue Line rising but below 50 while yellow line below 50



Graph 2 : Aroon Indicator with possible trend types

Thus we have seen that this indicator is enough to tell us the entry and exit points by giving us the possible consolidation or coming trend. However the relation of this with the options is needed to be backtested.

Every indicator works differently on different assets and might not give same returns on other assets. Though the theory remains the same but the accuracy and effectiveness might be more or less.

IV. STRATEGY

Our strategy using this indicator will be to enter in the short straddle when the consolidation phase has been indicated meaning both the lines are declining. This gives us the best chance to enter in the consolidation phase as early possible. However when to exit is the key and might change the whole return possibility of strategy. Here it brings the most important question as to whether hold the position till expiry or to exit in between. When we look at the reaction on stock price of this indicator the exit point is needed to be based on this indicator. Thus the short straddle position has to be closed when either of the two lines on the Aroon Indicator fulfills both the conditions.

- (i) Either of the two line rising.
- (ii) The rising line is above 50 level.

Thus we will exit the strategy when clear strong trend is indicated and not on weak trends. This brings the need for patience in the trader as to not take a decision in hurry and exit at either of the two conditions but not both.

V. DATA

This strategy has been back tested for the past nine months and the returns of each trade are shown in the table 1.

Table 1 : Entry Date and Profit / (Loss)

Trade Date	Profit / (Loss)
9 May	2455
18 April	8368.75
17 March	17650.04

23 March	9196.29
24 February	3658.73
2 March	-6013.75
31 January	23760.02
2 February	4736.23
9 February	16551.21
16 February	-4813.75
16 January	10613.71
19 January	-490.04
12 January	1073.75
11 January	5842.5
5 January	1111.25
29 December	48.73
27 December	1922.46
15 December	-7776.25
6 December	-1108.79
28 November	4120.04
18 November	3906.25
10 November	-1471.25
3 November	6545
27 October	8760.00
2 November	7739.96
13 October	97.5
20 October	-2715
3 October	-12273.79
6 October	6567.5
22 September	-24441.25
16 September	19567.54
9 September	1995
6 September	3241.25
1 September	923.75
25 August	3121.25
23 August	4603.75

Table 1 indicates the profit in rupees for every trade taken since 23 August 2022 till 9 May 2022.



Graph 3 : Graphical representation of the trades returns

Graph 2 represents the profit and loss of the strategy in the form of a graph.

Table 2 : Division of trades in terms of gaining or losing

Trade	Number	Percentage
Profit	27	75 %
Loss	9	25 %
Total	36	100 %

Table 2 shows that the strategy is successful in giving profits in 3 of the 4 times it has been done. Thus the return ratio is high enough to make this strategy success in terms of minimizing the number of losses.

However this puts the important question about the magnitude of profit and loss. This puts the important concept of total profit from these trades and the expected return in the future.

Table 3 : Average Profit or Loss in trades

Trade	Average Profit or Loss
Profit	6599.16
Loss	-6789.31
Total	3252.04

Now table 3 indicates that the average return on the trade is Rs. 5,325.24 which is 0.3550 % return on margin required of Rs. 1,50,000 for the strategy. The margin would differ during this period but would stay near to this figure.

Table 4 : Detailed returns and duration of strategy

Time Period	262 Days
Margin Required	1,50,000
Buffer Capital	50,000
Net Profit	117073.59
Net Return	58.53 %
CAGR	87.68 %

Table 4 indicates that a decent time has been undertaken to study this strategy and has given high returns. We can expect more than 50 % of return if the market moves as per the history in this indicator.

Though the CAGR is more important factor to study as the absolute return is for less than a year with getting payments before the completion of year. This return that crosses a mark of 80 % is more important here.

We need to focus on the consistency and the returns that we can receive in this strategy before implementing in the market. There are slippages and brokerages not accounted for in these figures but that depends on many factors.

Since we are trading in highly liquid Bank Nifty options the chances of slippages are less and due to not trading everyday those figures drop even further. Apart from that brokerage in today's times is not much of a concern.

More than brokerages the charges and taxes are more of a concern since we have reached a market with discount brokerage facilities. When we increase lots the expense increases but the brokerage remains constant.

Table 5 : Position brokerage and other charges

Strike Price	44000
Option	CE
Expiry	15 June
Selling Price	270
Buying Price	199
Lots	10
Brokerage	Rs. 40
STT Total	Rs. 84
Exchange Transaction Charges	Rs. 117.25
Clearing Charges	Rs. 0
GST	Rs. 28.30
SEBI Charges	Rs. 0.27
Stamp Duty	Rs. 3
Total Tax and Charges	Rs. 272.82
Strike Price	44000
Option	PE
Expiry	15 June
Selling Price	222
Buying Price	163
Lots	10
Brokerage	Rs. 40
STT Total	Rs. 69
Exchange Transaction Charges	Rs. 96.25
Clearing Charges	Rs. 0
GST	Rs. 24.52
SEBI Charges	Rs. 0.22
Stamp Duty	Rs. 2
Total Tax and Charges	Rs. 231.99

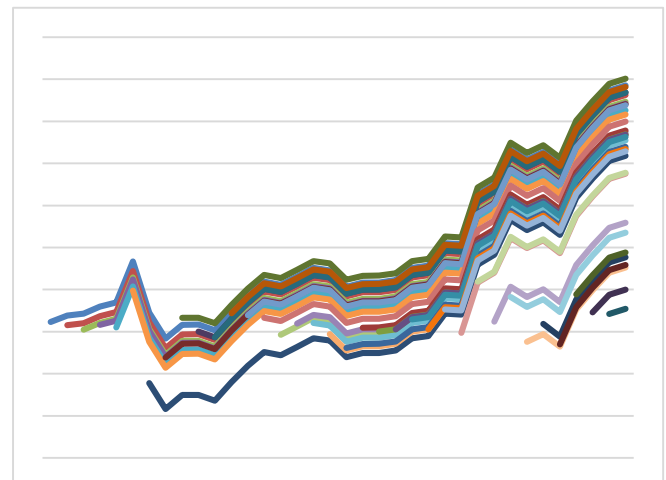
Table 6 : Payoff of this strategy from starting

Starting Date	Profit / (Loss)
23 August	117073.59
25 August	112469.84
1 September	109348.59
6 September	108424.84
9 September	105183.59
16 September	103188.59
22 September	83621.05
3 October	108062.3
6 October	120336.09
13 October	113768.59
20 October	113671.09

27 October	116386.09
2 November	107626.09
3 November	99886.13
10 November	93341.13
18 November	94812.38
28 November	90906.13
6 December	86786.09
15 December	87894.88
27 December	95671.13
29 December	93748.67
5 January	93699.94
11 January	92588.69
12 January	86746.19
16 January	85672.44
19 January	75058.73
31 January	75548.77
2 February	51788.75
9 February	47052.52
16 February	30501.31
24 February	35315.06
2 March	31656.33
17 March	37670.08
23 March	20020.04
18 April	10823.75
9 May	2455

Table 6 indicates the profit and loss had we started our strategy on that day. This is necessary as when we start our strategy we do not know where our first trade would lie it could give us profits or loss.

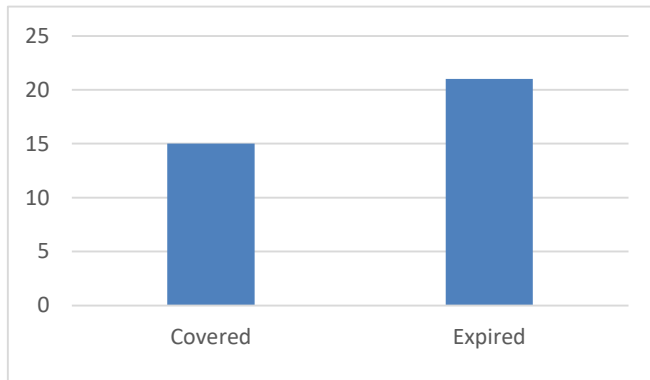
Thus had we started this strategy on any of the trades we would have ended up profitable in all of them. Such payoff is important for any trader who is trying to implement a new strategy and is afraid by losing his capital to markets.



Graph 4 : Graphical representation of strategy payoff

In this the Graph 3 represents what would be your payoff chart if you had started this strategy on any of the day. We need to understand the maximum drawdown we can have that would help us more.

When we look at this data at any point of time our drawdown is maximum at Rs. 36,715.04 which is well inside our buffer capital. Thus we need not quit the strategy due to our buffer capital lost due to loss in strategy.



Graph 5 : Indicating strategies covered or expired

Another important aspect is that out of total trades taken how many had to be covered before expiry or can be left to be expired. When strategy is left to expire it can be said that profit chances are more.

The logic behind that is we would leave the strategy without covering till expiry when the price is in our range and not outside profits. Meaning chances for profit are more here and would give returns.

VI. TRADING VIEW

The trading view code for the strategy is given below and is easy to use. When the value reaches 1 then we need to take a straddle and when it reaches -1 then we have to exit it giving us a clear point.

```
//@version=5
indicator(title="Straddle Strategy", shorttitle="Straddle Strategy", overlay=false, format=format.percent, precision=2, timeframe="", timeframe_gaps=true)
length = input.int(14, minval=1)
upper = 100 * (ta.highestbars(high, length) + length)/length
lower = 100 * (ta.lowestbars(low, length) + length)/length
plot(upper, "Aroon Up", color=#FB8C00)
plot(lower, "Aroon Down", color=#2962FF)
entry = if ( upper<upper[1] or upper<5 ) and ( lower<lower[1] or lower<5 )
1
else
0
exit1 = if ( upper>upper[1] or upper>95 ) and upper>50
-1
else
0
exit2 = if ( lower>lower[1] or lower>95 ) and lower>50
```

```
-1
else
0
signal = if ( entry + exit1 + exit2 ) >= 0
1
else
-1
plot ( signal )
```

VII. CONCLUSION

The strategy has been back tested and is successful giving a decent return with not a drawdown. We can use this in markets for trading straddles but risk is there due to having of undefined risk of the strategy.

Now this has been tested on Bank Nifty options but cannot be said for any other assets. Different indicators react differently to assets and Aroon Indicator will be theoretically right but might not be as effective.

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