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A Study on Advantages of Separate Trade book for Bull Call Spreads and Bear Put Spreads.

Chirag Babulal Shah
PhD (Pursuing), M.M.S., B.B.A., D.B.M., P.G.D.F.T., D.M.T.T.
Assistant Professor at Indian Education Society's Management College and Research Centre.

Abstract: *Derivatives are revolutionary instruments and have changed the way one looks at the financial world. Derivatives were introduced as a hedging tool. However, as the understanding of the intricacies of these instruments has evolved, it has become more of a speculative tool. The biggest advantage of Derivative instruments is the leverage it provides. The other benefit, which is not available in the spot market, is the ability to short the underlying, for more than a day. Thus it is now easy to take advantage of the downtrend.*
However, the small retail participants have not had a good overall experience of trading in derivatives and the public at large is still bereft of the advantages of derivatives. This has led to a phobia for derivatives among the small retail market participants, and they prefer to stick to the old methods of investing. The three main reasons identified are lack of knowledge, the margining methods and the quantity of the lot size. The brokers have also misled their clients and that has led to catastrophic results. The retail participation in the derivatives markets has dropped down dramatically.
But, are these derivative instruments and especially options, so bad? The answer is NO. This study has done a back testing of option strategies. It has been observed that, trading these strategies for a long period of time, yields good results. The back testing has been done on Bull Call Spreads and Bear Put Spreads and on Iron Condor strategies. The strategies have yielded very high Returns on Investments in a period of 7 years. However, since the strategies involve multiple options, some bought and some sold, the SPAN margin and Exposure margins drastically increase the Initial investment. This increase in investment makes the strategies less lucrative. The exchange allows the initial margins to be in any form of collateral. Still the margins are almost 10 times higher than the maximum possible loss in any event. The argument is that since there are short options in the strategy, there will be short option minimum charge, whether there is any unlimited loss or not.
Thus the introduction of a separate trade book for Bull Call Spreads and Bear Put Spreads will be helpful to retail participants. Here they will need to pay only the premium outflow and hence reduce the investments.
Keywords: *Derivatives, Nifty, Option Strategies, Bull Call Spreads, Bear Put Spreads.*

I. Introduction:

Option Strategies as a long term investment is unthinkable for the public at large, since the brokers have always sold derivative products as highly leveraged and a speculative product. A product where there is quick money and where long term view means keeping the contract till the expiry date. Most people don't understand option strategies and hence trade naked options just like they trade shares. However, they are mostly not aware of the factors affecting the option price, i.e. Time to expiry, Implied Volatility and lastly the direction of the market movement.

Eventually, when a trader is right in his view, he exits at small profits, but when he is wrong, he waits till the option expires at zero, hoping that his trade will turn profitable. Thus even if the trader's success ratio in taking a view is favorable, he ends up making more losses than the profits.

SEBI has recently shown concern for the retail investors, and noted that they are allured in trading derivatives because of the inbuilt leverage. Hence in a recent move, SEBI has asked the exchanges to increase the lot size, which attracts higher margin and hence keeps retail investors away from speculative practices. The diagnosis, that retail participants are losing money in derivatives is right, however the remedy of keeping them at bay is not welcomed. Less retail participation, will lead to immature markets and the market will be a playground for strong hands and algorithms, which may lead to manipulation of the prices.

The study tries to prescribe a remedy to help retail investors by back testing the results of a few option strategies as a long term investment method.

Traditionally, all asset classes have a linear payoff, in terms that an investor can only buy the asset and wait for the prices to go up. If the price goes down, there is a loss, and if the price goes up eventually, there is a profit. However, options are instruments which will allow you to have different views on the market and hence different payoffs. This is possible because there are four types of trades that one can do with options.

1. Buy Call
2. Sell Call
3. Buy Put
4. Sell Put

Since the buyer has to pay an upfront premium to buy the right to exercise, but not the obligation to honor the contract, the maximum loss is limited to the premium paid. Hence when one buys the option, he pays upfront the maximum possible loss. So there is no need of taking any initial margin.

However, when one sells an option, there is always a chance of unlimited loss, and hence the exchange, through its SPAN calculator, tries to assess the maximum loss in one day and collects it as SPAN margin. In any uncertain event, there can be an extreme loss; hence the exchange charges an extra extreme loss margin.

Prima facie the margin calculation system seems logical and fair. However, when there is a combination of options, the payoff structure changes and hence the margins should change. The SPAN calculator takes 16 risk arrays for the entire portfolio of options in consideration, and the maximum loss case scenario is the initial margin. For a strategy like a Bull call spread, in which one call is bought and a call with a higher strike price is sold, the maximum loss is the premium difference which is always positive. This means that the maximum loss in the strategy is the premium paid. However, since there is an option which is sold, the exchange would charge a short option minimum charge.

Thus the total margin exceeds much higher than the maximum possible loss. For the retail investor this is additional burden of investment.

The study will back test the result of a few strategies for 7 years, where the margin is much higher than the maximum possible loss and calculate the ROI. These strategies can be a useful tool for the retail investor, only if the excess margin is avoided.

Within the current framework, it doesn’t seem possible that the regulator or the exchange will waive off the short option minimum charge. An alternative would be to introduce a separate trade book for Bull call spreads and Bear put spreads. Here only the spread would be traded and hence there is no question of a short option minimum charge.

Spread trading would be easy for retail investors as it will be lesser complicated than trading naked options. The Spread trade book can run parallel with the normal option trade book. Any discrepancy in pricing will lead to a risk free arbitrage and hence equilibrium.

Separate spread trade books are currently present in one month and two month futures, two month and three month futures, and, One month and three month futures.

II. Literature Review

According to the Black and Scholes (1973) option pricingmodel, the option price is determined only by five input factors. Bollen and Whaley (2004) find evidence suggestingthat net buying pressure affects options’ implied volatility, which suggests that optionprices are affected by demand. According to their research, there are more index putstraded than index calls. However, the opposite is observed for individual stock options.Their findings suggest that the index put buying pressure drives the change in volatility ofindex options, while the stock call buying pressure drives the change in volatility of stockoptions. Intuitively, the demand for calls and puts would be different in rising and fallingmarkets. When the market becomes more volatile, the increasing volatility results in higher pricesfor both calls and puts.

Debashish and Mitra(2008) examined the lead and lag relationship between the cash markets and derivatives markets and concluded that derivatives markets led the cash markets. However other studies like Pradhan and Bhatt (2009), Johansen (1988), Basdas (2009) have observed that in many countries spot markets lead the derivatives markets. This ambiguity of which market leads the other, has made it very difficult for retail traders to take view and trade on prices.

Trennepohl and Dukes (1981) is among the earliest empirical research to test option writing and buying return.

Merton,Scholes and Gladstein (1978) concluded that certain option strategies like fully covered writing strategyhave been successful in changing the patterns of returns and are not reproducible by any simple strategy of combining stocks with fixed income securities.Covered strategy is a combination of the stock with its respective option. The strategy can give good returns in the long run compared to the traditional approach of long term investing in stocks.

Green and Figlewski (1999) examine the forecast of stock volatility and return of option writing. They find that at-the-money stock index calls have a high probability of producing large losses, with larger losses for longer time to maturity. Writing options with a delta hedge reduces the writer's risk exposure compared to naked writing, but risk is still considerable.The practice of option writing has increased steadily in recent years, and somepractitioners apply relatively complicated hedging techniques to manage writing risks(Collins; 2007).

Research done by Bondarenko (2003), Jones (2006), and Coval and Shumway (2001), examine the returns of strategies that involve puts and calls. They report that strategies involving put options offer good returns and that put options are more expensive than calls of comparable distance from the money. Yet, little research has been done to explore the returns from combinations, straddles, and collars.

Maheshwari (2013) concludes that market participants majorly retail participants may not be experiencing efficient markets, due to lack of education, liquidity and transaction charges. This is true in the current scenario as retail traders and investors view options as a highly leveraged instrument apt for speculating. However speculation does not always work and these investors shy away from derivatives markets once they burn their hands with leveraged losses.

III. Research Methodology:

The study will use secondary data on Nifty index stock options and check the results of Bull Call Spread and Bear Put spread options strategy from the period of Jan, 2008 to Dec, 2014. Secondary data of futures and options prices are available on the website of www.nseindia.com

At the start of every Derivative series month, a 200 point Nifty bull call spread strategy will be initiated and it will be squared off at the expiry price. A 200 point Nifty bear put spread strategy will also be initiated separately at the same time. The futures price on the opening of the current month will be considered as the spot price. To determine the At the money (ATM) strike price, the opening future price is taken as the reference point. The future price is rounded off to the nearest 100^{th} and that point is considered as the ATM.

In a Bull Call Spread or a Bear Put spread option strategy, the maximum profit and maximum loss is capped. There are no extreme loss case scenarios. The Breakeven point is the net premium added/subtracted, to the buying option strike price. Thus the strategy is easy to understand and implement. The strategy needs to be held till expiry. If squared off earlier during the life of the option, the profit or loss will be lesser than the maximum possible.

In the study, the total cumulative premium outflow will be considered as the investment and the net cumulative profit at the end of the 7 years will be considered as the final profit.

Here we assume 3 cases:

1. An options trader is always bullish on the market every month as he thinks the market will always go up in the long run. No matter what the sentiments are, the trader will follow the strategy mechanically.
2. An options trader is always bearish on the market as he thinks the prices are always higher than the value. No matter what the sentiments are, the trader will follow the strategy mechanically.
3. An options trader does not have any directional view, but is sure the market will move away from the start point. No matter what the sentiments are, the trader will follow the strategy mechanically.

Hence we analyze bull call spread, bear put spread and iron condor strategy respectively for 7 years.

The returns are then compared to

- Considering the maximum cumulative loss at any point during 7 years as investment.
- The total margin required for the strategy as per exchange and SEBI norms.

Objective of the study:

The main objective of this research study is to create a win-win situation for the retail investors and the exchange. The study will focus on the need for a separate trade book for option spreads The study will give retail investors a chance to profit from options trading using basic strategies which they can understand, rather than using complex models. The study will do a research on actual market prices and prove that such a methodology is possible. Options' trading is perceived as complex and is considered as a tool for only professionals. This study will focus on simplicity of trading option strategies.

Significance of the study:

The study will highlight on the faulty margin calculation system used by exchanges. Recently, SEBI has increased the lot size of derivative contracts to keep retail participants away from the derivatives markets as they have been making losses. The study will prove that retail participants can use option strategies as a long term investment tool and make good return on investment, if the margin calculation system is reviewed. Even, if the existing system is not changed, at least if a separate trade book for Bull call spreads and Bear put spreads is allowed, the small investor can benefit from it.

Assumptions and limitations of the research

- Bull call spread is an option strategy created on the same underlying asset by buying one call and selling a call of a higher strike price. The premium of the bought call is always higher than the sold call, or else there will be a risk free arbitrage.
- Bear Put spread is an option strategy created on the same underlying asset by buying one put and selling a put of a lower strike price. The premium of the bought put is always higher than the sold put, or else there will be a risk free arbitrage.
- The Regulator, SEBI, and the exchanges are not aware that the Bull call spread strategy and Bear put strategy has limited loss and limited profit, and in any case, there cannot be more loss or profit. Even though there are mandatory exams to be given by every trader, conducted by the regulator and the exchanges, which explicitly mentions the payoff of both strategies, the exchange feels the need to cover the extreme loss case scenario and take excess margin amounts and penalize the trader if those margins are not paid.
- The period from Jan, 2008 to Dec, 2014 has been a period when the Indian stock markets have seen all the practically extreme scenarios.
- The results are based on the past and hence not a guarantee for the future. However, one can safely assume the markets will more or less behave in the same way in the long run.
- The transaction costs including the brokerage and taxes are not included in the calculation as it may differ from broker to broker.

Back Testing Data and Analysis

Nifty options are considered in the study as they are most widely traded and the most liquid. Bull call spreads and Bear put spreads of 200 points on the Nifty are considered. Every expiry month is tabulated based on its first day. The open is the open price on the last Friday of the previous calendar month which also is the starting of the new series. Since the strategy has to initiate at the ATM, the strike which is closest to the open price is considered open strike. The close is the settlement price on the date of expiry. The spreads are calculated by subtracting the received premium by selling option, from the paid premium by buying option. The difference between the close price and the open strike is the intrinsic value that will remain on the last day. Since this strategy caps the profit at 200 points, any movement above 200 points will yield the maximum profit.
The Analysis for Bull Call Spread is shown in table 1.
The Analysis for Bear Put Spread is shown in table 2.
The Analysis for Iron Condor Spread is shown in table 3.

IV. Analysis and Findings

Looking at the data, one can observe that the market has behaved in quite random manner. In some months there had been extreme movements and in some there was no movement at all. The direction of the market has been up in 46 months and down in 38 months from its starting point of the expiry period. In these 84 months, markets have behaved in all risk scenarios and hence it can be called an optimum sample for capital markets.

If one had initiated Bull Call spreads (200 pts) every month for 7 years (See Table 1)

Profit at end of 7 years	=	Rs. **1150.70**
Max cumulative loss at any point	=	Rs. 474.25
Max Cumulative profit at any point =		Rs. 1213.66
Max Investment	=	Rs. **546.60**
Margin as per existing rules	=	Rs. 450.00 (per share)
Max Investment including margin	=	Rs. **996.60**

If one had initiated Bear Put spreads (200 pts) every month for 7 years (See Table 2)

Profit at end of 7 years	=	Rs. **224.55**
Max cumulative loss at any point	=	Rs. 72.80
Max cumulative profit at any point	=	Rs. 762.80

Max Investment	=	Rs. **167.80**
Margin as per existing rules	=	Rs. 450.00 (per share)
Max Investment including margin	=	Rs. **567.80**

If one had initiated both Bull Call and Bear Put spreads (200 pts) together making an iron condor spread every month for 7 years (See table 3)

Profit at end of 7 years	=	Rs.**1375.26**
Max Cumulative loss at any point	=	Rs. 0.00
Max Cumulative profit at any point	=	Rs. 1375.26
Max Investment	=	Rs. **128.70**
Margin as per existing rules	=	Rs. 890.00 (per share)
Max Investment including margin	=	Rs. **1018.70**

V. Conclusion:

- ✓ The study is done with a mechanical approach and still the yield is quite high. If human aspects such as intellectual analysis, news flows, exits at the right time before expiry, etc. are used, the net profit can be considerably increased.
- ✓ For a person who thinks the market will go up in the long run, and hence is always bullish on the market, using the bull call spread consistently, ends up with a decent ROI.
- ✓ For a person who wants to be bearish on the market all the time, using Bear put spreads consistently gives fair ROI.
- ✓ For a person who believes that the direction of the market is hard to predict, but is sure that the market will move away from its start point, can do both, Bull call spread and Bear put spread, thus creating an Iron condor strategy. This strategy has shown fantastic results.
- ✓ All strategies discussed have good ROIs if compared to the actual premium investment. But if one considers the entire margin that is required for the strategy, the ROIs fall down drastically.
- ✓ Hence, if there is a separate trade book for option spreads, there will be no need for the high margin investments, and one can take advantage of the option strategies.
- ✓ Having separate trade book for option spreads will allow the investor to do a single trade rather than two trades for a strategy. This will bring down the burden of expenses like brokerage and taxes. It will also eliminate the execution loss between two trades.
- ✓ A separate trade book for option spreads will attract retail clients who would like to passively trade in options. Thus the retail participation can increase, leading to a matured market.

Scope and policy implications:

- The study shows the need for a change in the existing margining system.
- If the existing system is difficult to change, introducing a separate trade book for option spreads can do the work.
- The study proves that options can be used as a long term investment tool, which can give decent returns on investment.
- This study can be used by brokers, exchanges and regulators to bring back confidence among retail participants who have developed a phobia for the derivatives markets.
- Increased retail participation will result in much more mature markets and price discovery across all asset classes will improve. It will also dissuade manipulation of asset prices.
- The study will also discourage unnecessary speculation and abuse of the excessive leverage inbuilt in derivative instruments like options.

Appendix 1 = Bull Call Spread

Date	Open Strike Price	Open	Expiry Date Price	Diff of Expiry Close and open strike	Call Spread	Call net P/l	Call Cumulative
28-Dec-07	6100.00	6 080.00	5133.25	-966.75	60.80	(60.80)	(60.80)
1-Feb-08	5100.00	5 121.85	5271.50	171.50	78.50	93.00	32.20
29-Feb-08	5200.00	5 225.10	4828.70	-371.30	60.00	(60.00)	(27.80)
28-Mar-08	4900.00	4 885.00	5002.20	102.20	93.00	9.20	(18.60)
25-Apr-08	5000.00	5 021.90	4841.20	-158.80	94.00	(94.00)	(112.60)
30-May-08	4900.00	4 879.00	4308.45	-591.55	90.00	(90.00)	(202.60)
27-Jun-08	4100.00	4 136.35	4332.05	232.05	88.00	112.00	(90.60)
1-Aug-08	4300.00	4 270.00	4218.20	-81.80	84.00	(84.00)	(174.60)
29-Aug-08	4300.00	4 291.00	4115.35	-184.65	66.70	(66.70)	(241.30)
26-Sep-08	4100.00	4 108.90	2689.35	-1410.65	80.15	(80.15)	(321.45)
30-Oct-08	2900.00	2 825.55	2757.85	-142.15	116.35	(116.35)	(437.80)
28-Nov-08	2700.00	2 701.20	2913.35	213.35	85.40	114.60	(323.20)
26-Dec-08	3000.00	2,973.40	2823.70	-176.30	76.70	(76.70)	(399.90)
30-Jan-09	2800.00	2,770.20	2785.65	-14.35	74.35	(74.35)	(474.25)
27-Feb-09	2800.00	2,758.70	3082.70	282.70	72.35	127.65	(346.60)
27-Mar-09	3100.00	3,071.00	3473.90	373.90	83.20	116.80	(229.80)
04-May-09	3600.00	3,621.00	4336.95	736.95	86.10	113.90	(115.90)
29-May-09	4400.00	4,365.00	4241.80	-158.20	76.95	(76.95)	(192.85)
26-Jun-09	4300.00	4,299.00	4571.15	271.15	80.00	120.00	(72.85)
31-Jul-09	4600.00	4,631.10	4688.00	88.00	85.65	2.35	(70.50)
28-Aug-09	4700.00	4,705.00	4986.50	286.50	85.40	114.60	44.10
25-Sep-09	5000.00	4,958.00	4750.25	-249.75	85.00	(85.00)	(40.90)
30-Oct-09	4800.00	4,845.00	5005.30	205.30	82.20	117.80	76.90
27-Nov-09	4900.00	4,918.00	5202.30	302.30	87.30	112.70	189.60
01-Jan-10	5200.00	5 225.00	4867.20	-332.80	85.55	(85.55)	104.05
29-Jan-10	4800.00	4 826.15	4860.10	60.10	68.00	(7.90)	96.15
26-Feb-10	4900.00	4 867.00	5260.65	360.65	103.00	97.00	193.15
26-Mar-10	5300.00	5 276.00	5254.10	-45.90	65.00	(65.00)	128.15
30-Apr-10	5300.00	5 263.80	5004.00	-296.00	68.05	(68.05)	60.10
28-May-10	5000.00	5 025.00	5320.55	320.55	100.00	100.00	160.10
25-Jun-10	5300.00	5 298.00	5408.75	108.75	92.50	16.25	176.35
30-Jul-10	5400.00	5 394.80	5477.70	77.70	78.50	(0.80)	175.55
27-Aug-10	5500.00	5 460.50	6030.00	530.00	66.00	134.00	309.55
01-Oct-10	6100.00	6 065.00	5987.70	-112.30	66.85	(66.85)	242.70
29-Oct-10	6100.00	6 050.00	5800.00	-300.00	65.75	(65.75)	176.95
26-Nov-10	5800.00	5 845.65	6102.95	302.95	93.40	106.60	283.55
31-Dec-10	6100.00	6 131.00	5604.20	-495.80	87.90	(87.90)	195.65
28-Jan-11	5600.00	5 617.00	5265.30	-334.70	91.50	(91.50)	104.15
25-Feb-11	5300.00	5 327.10	5824.20	524.20	84.40	115.60	219.75
01-Apr-11	5900.00	5 865.10	5784.00	-116.00	79.80	(79.80)	139.95
29-Apr-11	5800.00	5 789.80	5402.15	-397.85	87.00	(87.00)	52.95
27-May-11	5400.00	5 415.00	5644.10	244.10	77.90	122.10	175.05
01-Jul-11	5700.00	5 700.20	5492.70	-207.30	69.00	(69.00)	106.05
29-Jul-11	5500.00	5 479.90	4841.75	-658.25	71.00	(71.00)	35.05
26-Aug-11	4900.00	4 855.30	5019.40	119.40	81.00	38.40	73.45
30-Sep-11	5000.00	4 999.80	5181.95	181.95	92.00	89.95	163.40
26-Oct-11	5200.00	5 241.15	4755.00	-445.00	97.85	(97.85)	65.55
25-Nov-11	4800.00	4 750.00	4648.60	-151.40	75.10	(75.10)	(9.55)
30-Dec-11	4700.00	4 689.90	5161.40	461.40	73.45	126.55	117.00
27-Jan-12	5200.00	5 201.00	5488.25	288.25	62.20	137.80	254.80
24-Feb-12	5500.00	5 532.00	5177.00	-323.00	93.55	(93.55)	161.25
30-Mar-12	5200.00	5 246.00	5186.65	-13.35	94.55	(94.55)	66.70
27-Apr-12	5200.00	5 200.00	4916.25	-283.75	91.90	(91.90)	(25.20)
01-Jun-12	4900.00	4 908.50	5150.75	250.75	88.95	111.05	85.85
29-Jun-12	5200.00	5 215.30	5043.25	-156.75	63.20	(63.20)	22.65
27-Jul-12	5100.00	5 144.45	5306.90	206.90	80.10	119.90	142.55
31-Aug-12	5300.00	5 321.00	5652.95	352.95	76.30	123.70	266.25
28-Sep-12	5700.00	5 714.90	5704.70	4.70	69.00	(64.30)	201.95
26-Oct-12	5700.00	5 711.10	5828.05	128.05	74.80	53.25	255.20

30-Nov-12	5900.00	5 891.10	5874.20	-25.80	61.00	(61.00)	194.20
28-Dec-12	5900.00	5 932.50	6037.25	137.25	79.65	57.60	251.80
01-Feb-13	6100.00	6 068.95	5692.45	-407.55	55.65	(55.65)	196.15
01-Mar-13	5700.00	5 718.95	5676.50	-23.50	68.05	(68.05)	128.10
05-Apr-13	5700.00	5 716.35	5910.05	210.05	70.29	129.71	257.81
26-Apr-13	5900.00	5 919.00	6124.20	224.20	72.85	127.15	384.96
31-May-13	6100.00	6 119.00	5683.90	-416.10	72.30	(72.30)	312.66
28-Jun-13	5800.00	5 761.15	5907.35	107.35	62.00	45.35	358.01
26-Jul-13	6000.00	5 955.00	5416.75	-583.25	69.00	(69.00)	289.01
30-Aug-13	5400.00	5 400.00	5883.85	483.85	85.00	115.00	404.01
27-Sep-13	6000.00	5 951.25	6294.90	294.90	80.75	119.25	523.26
01-Nov-13	6300.00	6 315.05	6087.05	-212.95	77.90	(77.90)	445.36
29-Nov-13	6200.00	6 162.00	6279.35	79.35	72.80	6.55	451.91
27-Dec-13	6300.00	6 340.00	6069.20	-230.80	67.00	(67.00)	384.91
31-Jan-14	6100.00	6 115.00	6238.85	138.85	73.75	65.10	450.01
28-Feb-14	6300.00	6 265.40	6646.20	346.20	60.10	139.90	589.91
28-Mar-14	6700.00	6 708.60	6837.05	137.05	74.35	62.70	652.61
25-Apr-14	6900.00	6 900.00	7238.90	338.90	92.20	107.80	760.41
30-May-14	7300.00	7 275.50	7497.95	197.95	66.85	131.10	891.51
27-Jun-14	7600.00	7 550.00	7723.75	123.75	69.25	54.50	946.01
01-Aug-14	7700.00	7 686.05	7952.75	252.75	70.20	129.80	1075.81
01-Sep-14	8000.00	8 021.20	7902.25	-97.75	72.40	(72.40)	1003.41
26-Sep-14	8000.00	7 956.00	8166.60	166.60	67.65	98.95	1102.36
31-Oct-14	8200.00	8 234.95	8493.00	293.00	88.70	111.30	1213.66
28-Nov-14	8600.00	8 576.10	8182.75	-417.25	62.95	(62.95)	1150.71

Appendix 2 = Bear Put Spread

Date	Open Strike Price	Open	Expiry Date Price	Diff of Expiry Close and open strike	Put Spread	Put net P/l	Put Cumulative
28-Dec-07	6100.00	6 080.00	5133.25	(966.75)	67.90	132.10	132.10
1-Feb-08	5100.00	5 121.85	5271.50	171.50	101.15	(101.15)	30.95
29-Feb-08	5200.00	5 225.10	4828.70	(371.30)	83.90	116.10	147.05
28-Mar-08	4900.00	4 885.00	5002.20	102.20	76.05	(76.05)	71.00
25-Apr-08	5000.00	5 021.90	4841.20	(158.80)	82.00	76.80	147.80
30-May-08	4900.00	4 879.00	4308.45	(591.55)	60.10	139.90	287.70
27-Jun-08	4100.00	4 136.35	4332.05	232.05	55.00	(55.00)	232.70
1-Aug-08	4300.00	4 270.00	4218.20	(81.80)	67.00	14.80	247.50
29-Aug-08	4300.00	4 291.00	4115.35	(184.65)	71.00	113.65	361.15
26-Sep-08	4100.00	4 108.90	2689.35	(1410.65)	70.30	129.70	490.85
30-Oct-08	2900.00	2 825.55	2757.85	(142.15)	75.05	67.10	557.95
28-Nov-08	2700.00	2 701.20	2913.35	213.35	80.00	(80.00)	477.95
26-Dec-08	3000.00	2,973.40	2823.70	(176.30)	55.20	121.10	599.05
30-Jan-09	2800.00	2,770.20	2785.65	(14.35)	74.60	(60.25)	538.80
27-Feb-09	2800.00	2,758.70	3082.70	282.70	79.90	(79.90)	458.90
27-Mar-09	3100.00	3,071.00	3473.90	373.90	74.00	(74.00)	384.90
04-May-09	3600.00	3,621.00	4336.95	736.95	90.00	(90.00)	294.90
29-May-09	4400.00	4,365.00	4241.80	(158.20)	89.00	69.20	364.10
26-Jun-09	4300.00	4,299.00	4571.15	271.15	90.00	(90.00)	274.10
31-Jul-09	4600.00	4,631.10	4688.00	88.00	89.00	(89.00)	185.10
28-Aug-09	4700.00	4,705.00	4986.50	286.50	77.45	(77.45)	107.65
25-Sep-09	5000.00	4,958.00	4750.25	(249.75)	78.00	122.00	229.65
30-Oct-09	4800.00	4,845.00	5005.30	205.30	61.25	(61.25)	168.40
27-Nov-09	4900.00	4,918.00	5202.30	302.30	72.00	(72.00)	96.40
01-Jan-10	5200.00	5 225.00	4867.20	(332.80)	64.70	135.30	231.70
29-Jan-10	4800.00	4 826.15	4860.10	60.10	100.00	(100.00)	131.70
26-Feb-10	4900.00	4 867.00	5260.65	360.65	75.00	(75.00)	56.70
26-Mar-10	5300.00	5 276.00	5254.10	(45.90)	67.05	(21.15)	35.55
30-Apr-10	5300.00	5 263.80	5004.00	(296.00)	66.10	133.90	169.45
28-May-10	5000.00	5 025.00	5320.55	320.55	58.60	(58.60)	110.85
25-Jun-10	5300.00	5 298.00	5408.75	108.75	56.95	(56.95)	53.90
30-Jul-10	5400.00	5 394.80	5477.70	77.70	60.20	(60.20)	(6.30)
27-Aug-10	5500.00	5 460.50	6030.00	530.00	66.50	(66.50)	(72.80)
01-Oct-10	6100.00	6 065.00	5987.70	(112.30)	95.00	17.30	(55.50)

29-Oct-10	6100.00	6 050.00	5800.00	(300.00)	73.00	127.00	71.50
26-Nov-10	5800.00	5 845.65	6102.95	302.95	58.30	(58.30)	13.20
31-Dec-10	6100.00	6 131.00	5604.20	(495.80)	55.60	144.40	157.60
28-Jan-11	5600.00	5 617.00	5265.30	(334.70)	76.45	123.55	281.15
25-Feb-11	5300.00	5 327.10	5824.20	524.20	85.00	(85.00)	196.15
01-Apr-11	5900.00	5 865.10	5784.00	(116.00)	74.00	42.00	238.15
29-Apr-11	5800.00	5 789.80	5402.15	(397.85)	73.75	126.25	364.40
27-May-11	5400.00	5 415.00	5644.10	244.10	67.35	(67.35)	297.05
01-Jul-11	5700.00	5 700.20	5492.70	(207.30)	70.00	130.00	427.05
29-Jul-11	5500.00	5 479.90	4841.75	(658.25)	67.00	133.00	560.05
26-Aug-11	4900.00	4 855.30	5019.40	119.40	80.50	(80.50)	479.55
30-Sep-11	5000.00	4 999.80	5181.95	181.95	63.45	(63.45)	416.10
26-Oct-11	5200.00	5 241.15	4755.00	(445.00)	55.00	145.00	561.10
25-Nov-11	4800.00	4 750.00	4648.60	(151.40)	80.85	70.55	631.65
30-Dec-11	4700.00	4 689.90	5161.40	461.40	69.90	(69.90)	561.75
27-Jan-12	5200.00	5 201.00	5488.25	288.25	61.90	(61.90)	499.85
24-Feb-12	5500.00	5 532.00	5177.00	(323.00)	61.60	138.40	638.25
30-Mar-12	5200.00	5 246.00	5186.65	(13.35)	57.40	(44.05)	594.20
27-Apr-12	5200.00	5 200.00	4916.25	(283.75)	61.65	138.35	732.55
01-Jun-12	4900.00	4 908.50	5150.75	250.75	64.50	(64.50)	668.05
29-Jun-12	5200.00	5 215.30	5043.25	(156.75)	62.00	94.75	762.80
27-Jul-12	5100.00	5 144.45	5306.90	206.90	59.00	(59.00)	703.80
31-Aug-12	5300.00	5 321.00	5652.95	352.95	56.25	(56.25)	647.55
28-Sep-12	5700.00	5 714.90	5704.70	4.70	61.30	(61.30)	586.25
26-Oct-12	5700.00	5 711.10	5828.05	128.05	58.80	(58.80)	527.45
30-Nov-12	5900.00	5 891.10	5874.20	(25.80)	63.00	(37.20)	490.25
28-Dec-12	5900.00	5 932.50	6037.25	137.25	55.70	(55.70)	434.55
01-Feb-13	6100.00	6 068.95	5692.45	(407.55)	67.30	132.70	567.25
01-Mar-13	5700.00	5 718.95	5676.50	(23.50)	64.80	(41.30)	525.95
05-Apr-13	5700.00	5 716.35	5910.05	210.05	54.80	(54.80)	471.15
26-Apr-13	5900.00	5 919.00	6124.20	224.20	55.15	(55.15)	416.00
31-May-13	6100.00	6 119.00	5683.90	(416.10)	57.00	143.00	559.00
28-Jun-13	5800.00	5 761.15	5907.35	107.35	65.60	(65.60)	493.40
26-Jul-13	6000.00	5 955.00	5416.75	(583.25)	78.25	121.75	615.15
30-Aug-13	5400.00	5 400.00	5883.85	483.85	64.50	(64.50)	550.65
27-Sep-13	6000.00	5 951.25	6294.90	294.90	76.45	(76.45)	474.20
01-Nov-13	6300.00	6 315.05	6087.05	(212.95)	64.90	135.10	609.30
29-Nov-13	6200.00	6 162.00	6279.35	79.35	84.20	(84.20)	525.10
27-Dec-13	6300.00	6 340.00	6069.20	(230.80)	59.10	140.90	666.00
31-Jan-14	6100.00	6 115.00	6238.85	138.85	61.15	(61.15)	604.85
28-Feb-14	6300.00	6 265.40	6646.20	346.20	55.80	(55.80)	549.05
28-Mar-14	6700.00	6 708.60	6837.05	137.05	64.80	(64.80)	484.25
25-Apr-14	6900.00	6 900.00	7238.90	338.90	85.90	(85.90)	398.35
30-May-14	7300.00	7 275.50	7497.95	197.95	76.00	(76.00)	322.35
27-Jun-14	7600.00	7 550.00	7723.75	123.75	88.70	(88.70)	233.65
01-Aug-14	7700.00	7 686.05	7952.75	252.75	66.00	(66.00)	167.65
01-Sep-14	8000.00	8 021.20	7902.25	(97.75)	64.00	33.75	201.40
26-Sep-14	8000.00	7 956.00	8166.60	166.60	61.75	(61.75)	139.65
31-Oct-14	8200.00	8 234.95	8493.00	293.00	49.95	(49.95)	89.70
28-Nov-14	8600.00	8 576.10	8182.75	(417.25)	65.15	134.85	224.55

Appendix 3 = Iron Condor

Date	Open Strike Price	Open	Expiry Date Price	Diff of Expiry Close and open strike	Call Spread	Put Spread	Call net P/l	Put net P/l	Net P/L	Net Cumulative
28-Dec-07	6100.00	6 080.00	5133.25	(966.75)	60.80	67.90	(60.80)	132.10	71.30	71.30
1-Feb-08	5100.00	5 121.85	5271.50	171.50	78.50	101.15	93.00	(101.15)	(8.15)	63.15
29-Feb-08	5200.00	5 225.10	4828.70	(371.30)	60.00	83.90	(60.00)	116.10	56.10	119.25
28-Mar-08	4900.00	4 885.00	5002.20	102.20	93.00	76.05	9.20	(76.05)	(66.85)	52.40
25-Apr-08	5000.00	5 021.90	4841.20	(158.80)	94.00	82.00	(94.00)	76.80	(17.20)	35.20
30-May-08	4900.00	4 879.00	4308.45	(591.55)	90.00	60.10	(90.00)	139.90	49.90	85.10
27-Jun-08	4100.00	4 136.35	4332.05	232.05	88.00	55.00	112.00	(55.00)	57.00	142.10
1-Aug-08	4300.00	4 270.00	4218.20	(81.80)	84.00	67.00	(84.00)	14.80	(69.20)	72.90
29-Aug-08	4300.00	4 291.00	4115.35	(184.65)	66.70	71.00	(66.70)	113.65	46.95	119.85
26-Sep-08	4100.00	4 108.90	2689.35	(1410.65)	80.15	70.30	(80.15)	129.70	49.55	169.40
30-Oct-08	2900.00	2 825.55	2757.85	(142.15)	116.35	75.05	(116.35)	67.10	(49.25)	120.15
28-Nov-08	2700.00	2 701.20	2913.35	213.35	85.40	80.00	114.60	(80.00)	34.60	154.75
26-Dec-08	3000.00	2,973.40	2823.70	(176.30)	76.70	55.20	(76.70)	121.10	44.40	199.15
30-Jan-09	2800.00	2,770.20	2785.65	(14.35)	74.35	74.60	(74.35)	(60.25)	(134.60)	64.55
27-Feb-09	2800.00	2,758.70	3082.70	282.70	72.35	79.90	127.65	(79.90)	47.75	112.30
27-Mar-09	3100.00	3,071.00	3473.90	373.90	83.20	74.00	116.80	(74.00)	42.80	155.10
04-May-09	3600.00	3,621.00	4336.95	736.95	86.10	90.00	113.90	(90.00)	23.90	179.00
29-May-09	4400.00	4,365.00	4241.80	(158.20)	76.95	89.00	(76.95)	69.20	(7.75)	171.25
26-Jun-09	4300.00	4,299.00	4571.15	271.15	80.00	90.00	120.00	(90.00)	30.00	201.25
31-Jul-09	4600.00	4,631.10	4688.00	88.00	85.65	89.00	2.35	(89.00)	(86.65)	114.60
28-Aug-09	4700.00	4,705.00	4986.50	286.50	85.40	77.45	114.60	(77.45)	37.15	151.75
25-Sep-09	5000.00	4,958.00	4750.25	(249.75)	85.00	78.00	(85.00)	122.00	37.00	188.75
30-Oct-09	4800.00	4,845.00	5005.30	205.30	82.20	61.25	117.80	(61.25)	56.55	245.30
27-Nov-09	4900.00	4,918.00	5202.30	302.30	87.30	72.00	112.70	(72.00)	40.70	286.00
01-Jan-10	5200.00	5 225.00	4867.20	(332.80)	85.55	64.70	(85.55)	135.30	49.75	335.75
29-Jan-10	4800.00	4 826.15	4860.10	60.10	68.00	100.00	(7.90)	(100.00)	(107.90)	227.85
26-Feb-10	4900.00	4 867.00	5260.65	360.65	103.00	75.00	97.00	(75.00)	22.00	249.85
26-Mar-10	5300.00	5 276.00	5254.10	(45.90)	65.00	67.05	(65.00)	(21.15)	(86.15)	163.70
30-Apr-10	5300.00	5 263.80	5004.00	(296.00)	68.05	66.10	(68.05)	133.90	65.85	229.55
28-May-10	5000.00	5 025.00	5320.55	320.55	100.00	58.60	100.00	(58.60)	41.40	270.95
25-Jun-10	5300.00	5 298.00	5408.75	108.75	92.50	56.95	16.25	(56.95)	(40.70)	230.25
30-Jul-10	5400.00	5 394.80	5477.70	77.70	78.50	60.20	(0.80)	(60.20)	(61.00)	169.25
27-Aug-10	5500.00	5 460.50	6030.00	530.00	66.00	66.50	134.00	(66.50)	67.50	236.75
01-Oct-10	6100.00	6 065.00	5987.70	(112.30)	66.85	95.00	(66.85)	17.30	(49.55)	187.20
29-Oct-10	6100.00	6 050.00	5800.00	(300.00)	65.75	73.00	(65.75)	127.00	61.25	248.45
26-Nov-10	5800.00	5 845.65	6102.95	302.95	93.40	58.30	106.60	(58.30)	48.30	296.75
31-Dec-10	6100.00	6 131.00	5604.20	(495.80)	87.90	55.60	(87.90)	144.40	56.50	353.25
28-Jan-11	5600.00	5 617.00	5265.30	(334.70)	91.50	76.45	(91.50)	123.55	32.05	385.30
25-Feb-11	5300.00	5 327.10	5824.20	524.20	84.40	85.00	115.60	(85.00)	30.60	415.90
01-Apr-11	5900.00	5 865.10	5784.00	(116.00)	79.80	74.00	(79.80)	42.00	(37.80)	378.10
29-Apr-11	5800.00	5 789.80	5402.15	(397.85)	87.00	73.75	(87.00)	126.25	39.25	417.35
27-May-11	5400.00	5 415.00	5644.10	244.10	77.90	67.35	122.10	(67.35)	54.75	472.10
01-Jul-11	5700.00	5 700.20	5492.70	(207.30)	69.00	70.00	(69.00)	130.00	61.00	533.10
29-Jul-11	5500.00	5 479.90	4841.75	(658.25)	71.00	67.00	(71.00)	133.00	62.00	595.10
26-Aug-11	4900.00	4 855.30	5019.40	119.40	81.00	80.50	38.40	(80.50)	(42.10)	553.00
30-Sep-11	5000.00	4 999.80	5181.95	181.95	92.00	63.45	89.95	(63.45)	26.50	579.50
26-Oct-11	5200.00	5 241.15	4755.00	(445.00)	97.85	55.00	(97.85)	145.00	47.15	626.65
25-Nov-11	4800.00	4 750.00	4648.60	(151.40)	75.10	80.85	(75.10)	70.55	(4.55)	622.10
30-Dec-11	4700.00	4 689.90	5161.40	461.40	73.45	69.90	126.55	(69.90)	56.65	678.75
27-Jan-12	5200.00	5 201.00	5488.25	288.25	62.20	61.90	137.80	(61.90)	75.90	754.65
24-Feb-12	5500.00	5 532.00	5177.00	(323.00)	93.55	61.60	(93.55)	138.40	44.85	799.50
30-Mar-12	5200.00	5 246.00	5186.65	(13.35)	94.55	57.40	(94.55)	(44.05)	(138.60)	660.90
27-Apr-12	5200.00	5 200.00	4916.25	(283.75)	91.90	61.65	(91.90)	138.35	46.45	707.35
01-Jun-12	4900.00	4 908.50	5150.75	250.75	88.95	64.50	111.05	(64.50)	46.55	753.90
29-Jun-12	5200.00	5 215.30	5043.25	(156.75)	63.20	62.00	(63.20)	94.75	31.55	785.45
27-Jul-12	5100.00	5 144.45	5306.90	206.90	80.10	59.00	119.90	(59.00)	60.90	846.35
31-Aug-12	5300.00	5 321.00	5652.95	352.95	76.30	56.25	123.70	(56.25)	67.45	913.80
28-Sep-12	5700.00	5 714.90	5704.70	4.70	69.00	61.30	(64.30)	(61.30)	(125.60)	788.20
26-Oct-12	5700.00	5 711.10	5828.05	128.05	74.80	58.80	53.25	(58.80)	(5.55)	782.65
30-Nov-12	5900.00	5 891.10	5874.20	(25.80)	61.00	63.00	(61.00)	(37.20)	(98.20)	684.45
28-Dec-12	5900.00	5 932.50	6037.25	137.25	79.65	55.70	57.60	(55.70)	1.90	686.35
01-Feb-13	6100.00	6 068.95	5692.45	(407.55)	55.65	67.30	(55.65)	132.70	77.05	763.40
01-Mar-13	5700.00	5 718.95	5676.50	(23.50)	68.05	64.80	(68.05)	(41.30)	(109.35)	654.05
05-Apr-13	5700.00	5 716.35	5910.05	210.05	70.29	54.80	129.71	(54.80)	74.91	728.96
26-Apr-13	5900.00	5 919.00	6124.20	224.20	72.85	55.15	127.15	(55.15)	72.00	800.96
31-May-13	6100.00	6 119.00	5683.90	(416.10)	72.30	57.00	(72.30)	143.00	70.70	871.66
28-Jun-13	5800.00	5 761.15	5907.35	107.35	62.00	65.60	45.35	(65.60)	(20.25)	851.41
26-Jul-13	6000.00	5 955.00	5416.75	(583.25)	69.00	78.25	(69.00)	121.75	52.75	904.16
30-Aug-13	5400.00	5 400.00	5883.85	483.85	85.00	64.50	115.00	(64.50)	50.50	954.66
27-Sep-13	6000.00	5 951.25	6294.90	294.90	80.75	76.45	119.25	(76.45)	42.80	997.46
01-Nov-13	6300.00	6 315.05	6087.05	(212.95)	77.90	64.90	(77.90)	135.10	57.20	1054.66
29-Nov-13	6200.00	6 162.00	6279.35	79.35	72.80	84.20	6.55	(84.20)	(77.65)	977.01
27-Dec-13	6300.00	6 340.00	6069.20	(230.80)	67.00	59.10	(67.00)	140.90	73.90	1050.91
31-Jan-14	6100.00	6 115.00	6238.85	138.85	73.75	61.15	65.10	(61.15)	3.95	1054.86
28-Feb-14	6300.00	6 265.40	6646.20	346.20	60.10	55.80	139.90	(55.80)	84.10	1138.96
28-Mar-14	6700.00	6 708.60	6837.05	137.05	74.35	64.80	62.70	(64.80)	(2.10)	1136.86
25-Apr-14	6900.00	6 900.00	7238.90	338.90	92.20	85.90	107.80	(85.90)	21.90	1158.76
30-May-14	7300.00	7 275.50	7497.95	197.95	66.85	76.00	131.10	(76.00)	55.10	1213.86
27-Jun-14	7600.00	7 550.00	7723.75	123.75	69.25	88.70	54.50	(88.70)	(34.20)	1179.66
01-Aug-14	7700.00	7 686.05	7952.75	252.75	70.20	66.00	129.80	(66.00)	63.80	1243.46
01-Sep-14	8000.00	8 021.20	7902.25	(97.75)	72.40	64.00	(72.40)	33.75	(38.65)	1204.81
26-Sep-14	8000.00	7 956.00	8166.60	166.60	67.65	61.75	98.95	(61.75)	37.20	1242.01
31-Oct-14	8200.00	8 234.95	8493.00	293.00	88.70	49.95	111.30	(49.95)	61.35	1303.36
28-Nov-14	8600.00	8 576.10	8182.75	(417.25)	62.95	65.15	(62.95)	134.85	71.90	1375.26

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