

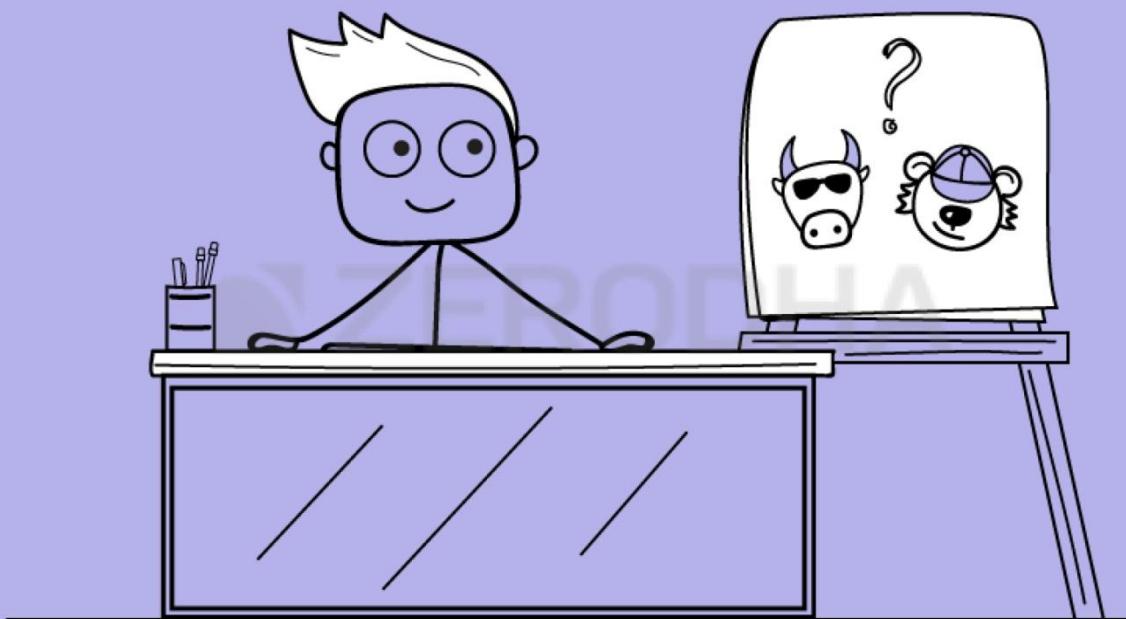
ZERODHA

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# Option Strategies

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## CHAPTER 1

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# Orientation

## 1.1 – Setting the context

Before we start this module on Option Strategy, I would like to share with you a Behavioral Finance article I read couple of years ago. The article was titled “Why winning is addictive”.

Here is the article, authored by B.Venkatesh (a regular columnist for HBL) –

“To buy and bet on a lottery ticket – a game that you typically avoid because you understand the odds of winning the jackpot is really low. However, if you do win the ticket, you will be most likely tempted to buy a lottery ticket regularly thereafter!

We exhibit similar behavior when it comes to our investments as well. What drives such behavior? As humans, our life is governed by anticipation. So, looking forward to winning a lottery is exciting and so is realizing that expectation.

Research in neuroscience has however shown that anticipating a win is more exciting than actual winning! Nevertheless, once you experience the excitement of winning a lottery you feel the need to indulge. That is, your brain compels you to buy a lottery ticket, even though you are aware of the odds of winning the second one.

This happens because we tend to use more of reflexive brain than reflective brain. The reflective brain performs calculation that helps you analyze and think. The reflexive brain helps you feel and is more intuitive. When you feel an urge to buy a lottery ticket, it is your reflexive brain that is pushing you to do so. Your reflective brain is likely to tell you that the odds of winning the jackpot for the second time are low!

Now consider trading in equity options. You know that buying calls and puts has its risk, as options often expire worthless. Yet we may choose to buy them regularly, especially if we have already experienced large gains from such investments, for it is the reflexive brain in action. With trading options there is another factor at play. We know that

options carry the risk of losing capital when our view on the underlying stock or the index turns wrong.

The fact that we can lose money makes our experience of winning against such odds even more exciting! This is not so much true of lottery because a lottery is a game of chance while investments, we believe, require some degree of skill”

You maybe be wondering, why I chose to post the above article right at the beginning of this module. Well, this article echoes some of my own thoughts; in fact it goes a step further to put things in the behavioral finance context. From the many interactions that I've have had with both experienced and aspiring options traders, one point is quite common - most options traders treat options trading as a ‘hit or miss’ kind of a trade. There is always a sense of amusement when one initiates an option trade, many don't realize how fatal this naïve amusement can be.

Traders buy options (month after month) with a hope they would double their investment. Trading options with such a mindset is a perfect recipe for a P&L disaster. The bottom line is this – if you aspire to trade options, you need to do it the right way and follow the right approach. Else you can be rest assured the gambling attitude will eventually consume your entire trading capital and you will end up having a short, self destructive option trading career.



I do have to mention this now - the common phrase that goes like this (w.r.t options) “limited risk, unlimited profit potential” is a silent P&L killer. Newbie traders are disillusioned by this ‘theoretically correct’ but practically disastrous fact and thereby end up blowing up their books, slowly and steadily. Hence I do believe that trading options blindly without a strategy is a “dangerous but irresistible pass time” (courtesy - Pink Floyd).

I don’t intend to scare you with this note; I’m only trying to set the context here. With the previous module on Options Theory, I’m sure you would have realized that unlike other topics in the markets, the science involved in Options is heavy duty. It can be quite overwhelming, but you will have to trust me here – the only way to understand and master options trading is by structuring your learning path with a good judicious mix of theory and practice.

In this module, I will attempt to give you a good overview of what you really need to know about some of the popular options strategies. Like always, I will try and stick to the practical aspect and ignore the unwanted (and confusing) theory part.

As far as I'm aware, there are close to 475 options strategies out there in the public domain and I'm sure at least another 100 odd strategies are hidden in the proprietary books of brokers, bankers, and traders. Given this should you know all these strategies put up in the public domain?

Answer is a simple no.

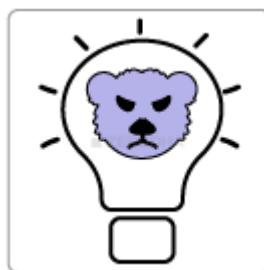
## 1.2 – What should you know?

You only need to know a handful of strategies but you need to know them really well. Once you know these strategies all you need to do is analyze the current state of markets (or the stock) and map it with the right option strategy from your strategy quiver.

Keeping this in perspective we will discuss certain strategies.



Bullish Strategies



Bearish Spreads



Neutral Strategies

- |                           |                          |                             |
|---------------------------|--------------------------|-----------------------------|
| 1. Bull Call Spread       | 1. Bear Call Spread      | 1. Long & Short Straddles   |
| 2. Bull Put Spread        | 2. Bear Put Spread       | 2. Long & Short Strangles   |
| 3. Call Ratio Back Spread | 3. Bull Put Ladder       | 3. Long & Short Iron Condor |
| 4. Bear Call Ladder       | 4. Put Ratio Back spread | 4. Long & Short Butterfly   |
| 5. Call Butterfly         | 5. Strip                 | 5. Box                      |
| 6. Synthetic Call         | 6. Synthetic Put         |                             |
| 7. Straps                 |                          |                             |

Besides discussing the above strategies I also intend to discuss –

1. Max Pain for option writing – (some key observations and practical aspects)
2. Volatility Arbitrage employing Dynamic Delta hedging

The plan is to discuss one option strategy per chapter so that there is ample clarity about the strategy, without any mix up or confusion. This means to say we will have roughly about 20 chapters in this module, although I suppose each chapter would not be too lengthy. For each of the strategy I will discuss the background, implementation, payoff, breakeven, and perhaps the right strikes to use considering the time to expiry. I also intend to share a working excel model which would come handy if you intent to employ the strategy.

Do note, while I will discuss all these strategies keeping the Nifty Index as reference, you can use the same for any stock options.

Now here is the most important thing I want you to be aware of – do not expect a holy grail in this module. None of the strategies that we discuss here in the module is sure shot money making machine; in fact nothing is in the markets. The objective here in this module is to ensure that we discuss few basic but important strategies, if you deploy them right you can make money.

Think about this way – if you have a nice car and drive it properly, you can use it to commute and ensure comfort of yourself and your family. However if you are rash with the car, then it can be dangerous to you and everyone else around you.

Likewise these strategies make money if you use it right; if you don't then they can create a hole in your P&L. My job here is to help you understand these strategies (help you learn how to drive the car) and I will also attempt to explain the best condition under which you can use these strategies. But making sure it works for you is in your control, this really depends on your discipline and reading of markets. Having said this, I'm reasonably certain your application of strategies will improve as and when you spend more 'quality' time in the markets.

So starting from the next chapter we focus on the Bullish strategies with the 'Bull Call Spread' making its debut.

Stay tuned.

## CHAPTER 2

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# Bull Call Spread

## 2.1 – Background

The spread strategies are some of the simplest option strategies that a trader can implement. Spreads are multi leg strategies involving 2 or more options. When I say multi leg strategies, it implies the strategy requires 2 or more option transactions.

Spread strategy such as the ‘Bull Call Spread’ is best implemented when your outlook on the stock/index is ‘moderate’ and not really ‘aggressive’. For example the outlook on a particular stock could be ‘moderately bullish’ or ‘moderately bearish’.

Some of the typical scenarios where your outlook can turn ‘moderately bullish’ are outlined as below –

**Fundamental perspective** - Reliance Industries is expected to make its Q3 quarterly results announcement. From the management’s Q2 quarterly guidance you know that the Q3 results are expected to be better than both Q2 and Q3 of last year. However you do not know by how many basis points the results will be better. This is clearly the missing part of the puzzle.

Given this you expect the stock price to react positively to the result announcement. However because the guidance was laid out in Q2 the market could have kind of factored in the news. This leads you to think that the stock can go up, but with a limited upside.

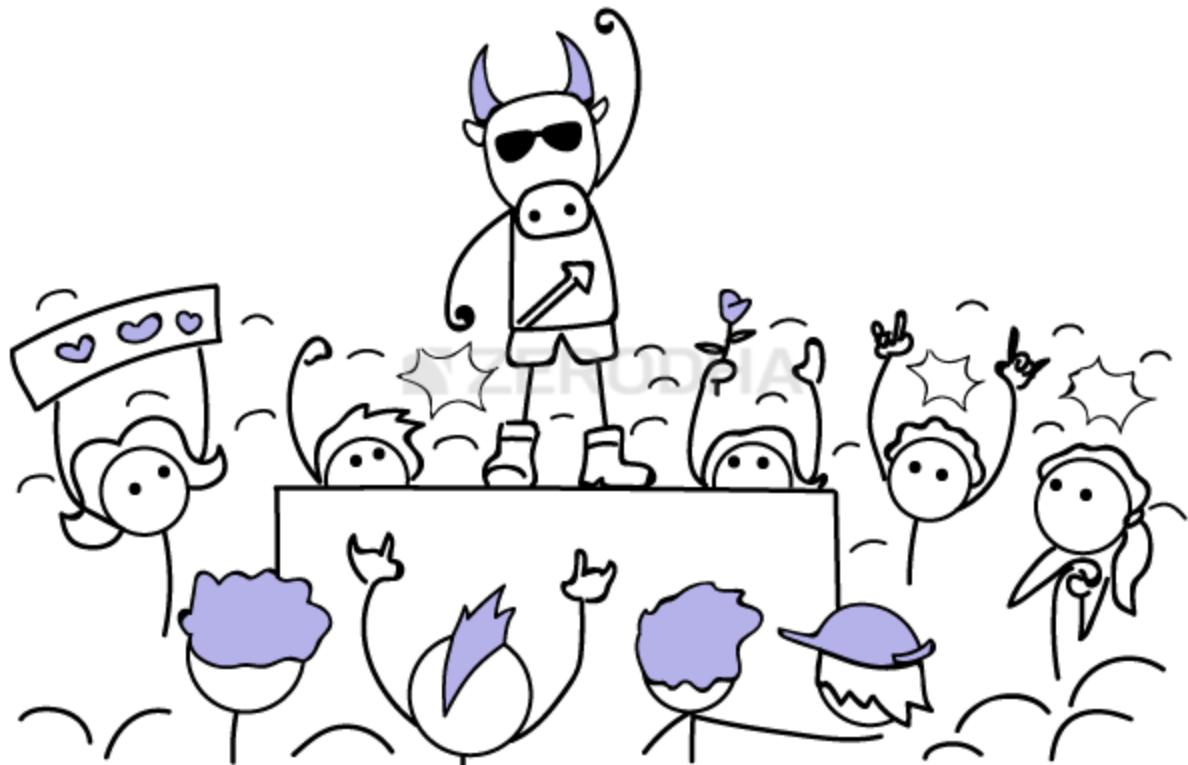
**Technical Perspective** – The stock that you are tracking has been in the down trend for a while, so much so that it is at a 52 week low, testing the 200 day moving average, and also near a multi-year support. Given all this there is a high probability that the stock could stage a relief rally. However you are not completely bullish as whatever said and done the stock is still in a downtrend.

**Quantitative Perspective** – The stock is consistently trading between the 1<sup>st</sup> standard deviation both ways (+1 SD & -1 SD), exhibiting a consistent mean reverting behavior. However there has been a sudden decline in the stock price, so much so that the stock price is now at the 2<sup>nd</sup> standard deviation. There is no fundamental reason backing the stock price decline, hence there is a good chance that the stock price could revert to mean. This makes you bullish on the stock, but the fact that it there is a chance that it could spend more time near the 2<sup>nd</sup> SD before reverting to mean caps your bullish outlook on the stock.

The point here is – your perspective could be developed from any theory (fundamental, technical, or quantitative) and you could find yourself in a ‘moderately bullish’ stance. In fact this is true for a ‘moderately bearish’ stance as well. In such a situation you can simply invoke a spread strategy wherein you can set up option positions in such a way that

1. You protect yourself on the downside (in case you are proved wrong)
2. The amount of profit that you make is also predefined (capped)
3. As a trade off (for capping your profits) you get to participate in the market for a lesser cost

The 3<sup>rd</sup> point could be a little confusing at this stage; you will get clarity on it as we proceed.



## 2.2 – Strategy notes

Amongst all the spread strategies, the bull call spread is one the most popular one. The strategy comes handy when you have a moderately bullish view on the stock/index.

The bull call spread is a two leg spread strategy traditionally involving ATM and OTM options. However you can create the bull call spread using other strikes as well.

To implement the bull call spread –

1. Buy 1 ATM call option (leg 1)
2. Sell 1 OTM call option (leg 2)

When you do this ensure –

1. All strikes belong to the same underlying
2. Belong to the same expiry series

3. Each leg involves the same number of options

For example –

Date – 23<sup>rd</sup> November 2015

Outlook – Moderately bullish (expect the market to go higher but the expiry around the corner could limit the upside)

Nifty Spot – 7846

ATM – 7800 CE, premium – Rs.79/-

OTM – 7900 CE, premium – Rs.25/-

Bull Call Spread, trade set up -

1. Buy 7800 CE by paying 79 towards the premium. Since money is going out of my account this is a debit transaction
2. Sell 7900 CE and receive 25 as premium. Since I receive money, this is a credit transaction
3. The net cash flow is the difference between the debit and credit i.e  $79 - 25 = 54$ .

Generally speaking in a bull call spread there is always a ‘net debit’, hence the bull call spread is also called referred to as a ‘debit bull spread’.

After we initiate the trade, the market can move in any direction and expiry at any level. Therefore let us take up a few scenarios to get a sense of what would happen to the bull call spread for different levels of expiry.

### **Scenario 1 - Market expires at 7700 (below the lower strike price i.e ATM option)**

The value of the call options would depend upon its intrinsic value. If you recall from the previous module, the intrinsic value of a call option upon expiry is –

Max [0, Spot-Strike]

In case of 7800 CE, the intrinsic value would be –

$\text{Max}[0, 7700 - 7800]$

$= \text{Max}[0, -100]$

$= 0$

Since the 7800 (ATM) call option has 0 intrinsic value we would lose the entire premium paid i.e Rs.79/-

The 7900 CE option also has 0 intrinsic value, but since we have sold/written this option we get to retain the premium of Rs.25.

So our net payoff from this would be –

$-79 + 25$

$= 54$

Do note, this is also the **net debit** of the overall strategy.

### **Scenario 2 - Market expires at 7800 (at the lower strike price i.e the ATM option)**

I will skip the math here, but you need to know that both 7800 and 7900 would have 0 intrinsic value, therefore the net loss would be 54.

### **Scenario 3 - Market expires at 7900 (at the higher strike price, i.e the OTM option)**

The intrinsic value of the 7800 CE would be –

$\text{Max}[0, \text{Spot-Strike}]$

$= \text{Max}[0, 7900 - 7800]$

$= 100$

Since we are long on this option by paying a premium of 79, we would make a profit of –

100 -79

= 21

The intrinsic value of 7900 CE would be 0, therefore we get to retain the premium Rs.25/-

Net profit would be  $21 + 25 = 46$

#### **Scenario 4 - Market expires at 8000 (above the higher strike price, i.e the OTM option)**

Both the options would have a positive intrinsic value

7800 CE would have an intrinsic value of 200, and the 7900 CE would have an intrinsic value of 100.

On the 7800 CE we would make  $200 - 79 = 121$  in profit

And on the 7900 CE we would lose  $100 - 25 = 75$

The overall profit would be

$121 - 75$

= 46

To summarize –

| Market Expiry | LS - IV | HS - IV | Net pay off |
|---------------|---------|---------|-------------|
| 7700          | 0       | 0       | (54)        |
| 7800          | 0       | 0       | (54)        |
| 7900          | 100     | 0       | +46         |
| 8000          | 200     | 100     | +46         |

From this, 2 things should be clear to you –

1. Irrespective of the down move in the market, the loss is restricted to Rs.54, the maximum loss also happens to be the ‘net debit’ of the strategy

2. The maximum profit is capped to 46. This also happens to be the difference between the spread and strategy's net debit

We can define the '**Spread**' as -

**Spread = Difference between the higher and lower strike price**

We can calculate the overall profitability of the strategy for any given expiry value. Here is screenshot of the calculations that I made on the excel sheet –

| Market Expiry | LS - IV | PP  | LS Payoff | HS - IV | PR | HS Payoff | Strategy Payoff |
|---------------|---------|-----|-----------|---------|----|-----------|-----------------|
| 7000          | 0       | -79 | -79       | 0       | 25 | 25        | -54             |
| 7100          | 0       | -79 | -79       | 0       | 25 | 25        | -54             |
| 7200          | 0       | -79 | -79       | 0       | 25 | 25        | -54             |
| 7300          | 0       | -79 | -79       | 0       | 25 | 25        | -54             |
| 7400          | 0       | -79 | -79       | 0       | 25 | 25        | -54             |
| 7500          | 0       | -79 | -79       | 0       | 25 | 25        | -54             |
| 7600          | 0       | -79 | -79       | 0       | 25 | 25        | -54             |
| 7700          | 0       | -79 | -79       | 0       | 25 | 25        | -54             |
| 7800          | 0       | -79 | -79       | 0       | 25 | 25        | -54             |
| 7900          | 100     | -79 | 21        | 0       | 25 | 25        | 46              |
| 8000          | 200     | -79 | 121       | 100     | 25 | -75       | 46              |
| 8100          | 300     | -79 | 221       | 200     | 25 | -175      | 46              |
| 8200          | 400     | -79 | 321       | 300     | 25 | -275      | 46              |
| 8300          | 500     | -79 | 421       | 400     | 25 | -375      | 46              |
| 8400          | 600     | -79 | 521       | 500     | 25 | -475      | 46              |
| 8500          | 700     | -79 | 621       | 600     | 25 | -575      | 46              |

- *LS - IV - Lower Strike - Intrinsic value (7800 CE, ATM)*
- *PP - Premium Paid*
- *LS Payoff - Lower Strike Payoff*
- *HS-IV - Higher strike - Intrinsic Value (7900 CE, OTM)*
- *PR - Premium Received*
- *HS Payoff - Higher Strike Payoff*

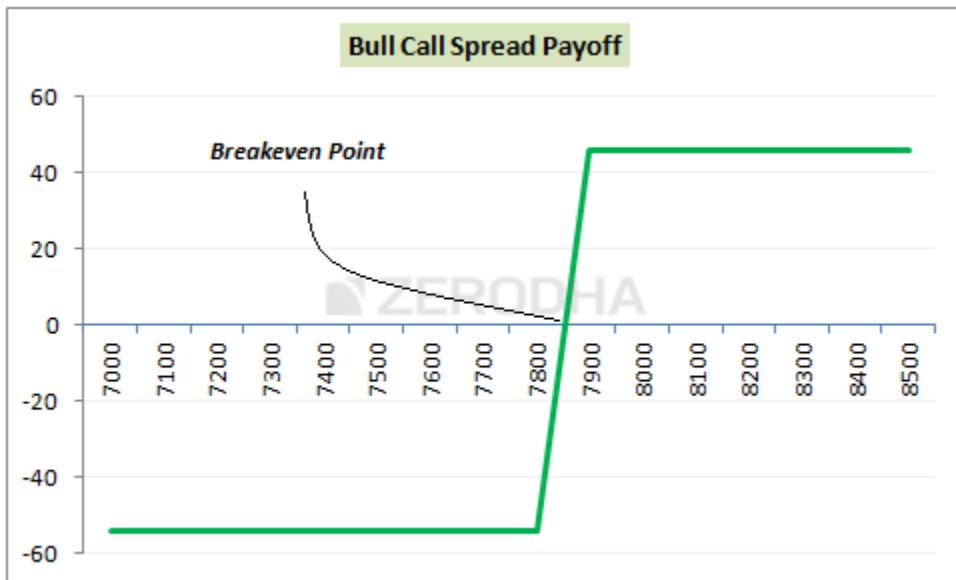
As you can notice, the loss is restricted to Rs.54, and the profit is capped to 46. Given this, we can generalize the Bull Call Spread to identify the Max loss and Max profit levels as -

Bull Call Spread Max loss = Net Debit of the Strategy

Net Debit = Premium Paid for lower strike – Premium Received for higher strike

Bull Call Spread Max Profit = Spread – Net Debit

This is how the pay off diagram of the Bull Call Spread looks like –



There are three important points to note from the payoff diagram –

1. The strategy makes a loss in Nifty expires below 7800. However the loss is restricted to Rs.54.
2. The breakeven point (where the strategy neither make a profit or loss) is achieved when the market expires at 7854 ( $7800 + 54$ ). Therefore we can generalize the breakeven point for a bull call spread as **Lower Strike + Net Debit**
3. The strategy makes money if the market moves above 7854, however the maximum profit achievable is Rs.46 i.e the difference between the strikes minus the net debit
  - a.  $7900 - 7800 = 100$
  - b.  $100 - 54 = 46$

I suppose at this stage you may be wondering why anyone would choose to implement a bull call spread versus buying a plain vanilla call option. Well, the main reason is the reduced strategy cost.

Do remember your outlook is ‘moderately bullish’. Given this buying an OTM option is ruled out. If you were to buy the ATM option you would have to pay Rs.79 as the option premium and if the market proves you wrong, you stand to lose Rs.79. However by implementing a bull call spread you reduce the overall cost to Rs.54 from Rs.79. As a tradeoff you also cap your upside. In my view this is a fair deal considering you are not aggressively bullish on the stock/index.

## **2.3 – Strike Selection**

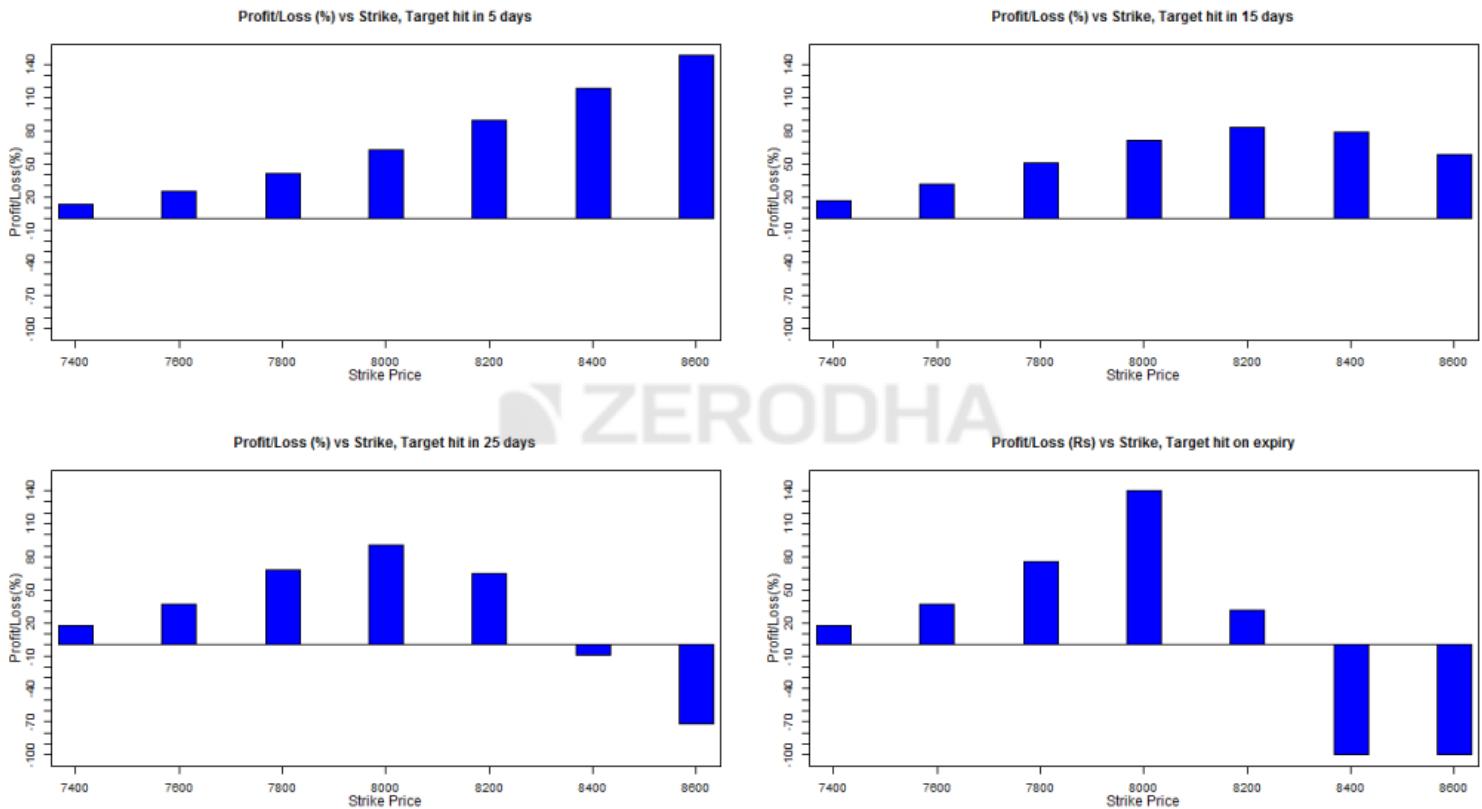
How would you quantify moderately bullish/bearish? Would you consider a 5% move on Infosys as moderately bullish move, or should it be 10% and above? What about the index such as Bank Nifty and Nifty 50? What about mid caps stocks such as Yes Bank, Mindtree, Strides Arcolab etc? Well, clearly there is no one shoe fits all solution here. One can attempt to quantify the ‘moderate-ness’ of the move by evaluating the stock/index volatility.

Based on volatility I have devised a few rules (works alright for me) you may want to improvise on it further - If the stock is highly volatile, then I would consider a move of 5-8% as ‘moderate’. However if the stock is not very volatile I would consider sub 5% as ‘moderate’. For indices I would consider sub 5% as moderate.

Now consider this - you have a ‘moderately bullish’ view on Nifty 50 (sub 5% move), given this which are the strikes to select for the bull call spread? Is the ATM + OTM combo the best possible spread?

The answer to this depends on good old Theta!

Here are a bunch of graphs that will help you identify the best possible strikes based on time to expiry.



Before understanding the graphs above a few things to note –

1. Nifty spot is assumed to be at 8000
2. Start of the series is defined as anytime during the first 15 days of the series
3. End of the series is defined as anytime during the last 15 days of the series
4. The bull call spread is optimized and the spread is created with 300 points difference

The thought here is that the market will move up moderately by about 3.75% i.e from 8000 to 8300. So considering the move and the time to expiry, the graphs above suggest –

1. **Graph 1 (top left)** - You are at the start of the expiry series and you expect the move over the next **5 days**, then a bull spread with far OTM is most profitable i.e 8600 (lower strike long) and 8900 (higher strike short)

2. **Graph 2 (top right)** - You are at the start of the expiry series and you expect the move over the next **15 days**, then a bull spread with slightly OTM is most profitable i.e 8200 and 8500
3. **Graph 3 (bottom left)** - You are at the start of the expiry series and you expect the move in **25 days**, then a bull spread with ATM is most profitable i.e 8000 and 8300. It is also interesting to note that the strikes above 8200 (OTM options) make a loss.
4. **Graph 4 (bottom right)** - You are at the start of the expiry series and you expect the move to occur **by expiry**, then a bull spread with ATM is most profitable i.e 8000 and 8300. Do note, the losses with OTM and far OTM options deepen.

Here are another bunch of charts; the only difference is that for the same move (i.e 3.75%) these charts suggest the best possible strikes to select assuming you are in the 2<sup>nd</sup> half of the series.



- Graph 1 (top left)** – If you expect a moderate move during the 2<sup>nd</sup> half of the series, and you expect the move to happen within **a day (or two)** then the best strikes to opt are far OTM i.e 8600 (lower strike long) and 8900 (higher strike short)
- Graph 2 (top right)** - If you expect a moderate move during the 2<sup>nd</sup> half of the series, and you expect the move to happen over the next **5 days** then the best strikes to opt are far OTM i.e 8600 (lower strike long) and 8900 (higher strike short). Do note, both Graph 1 and 2 are suggesting the same strikes, but the profitability of the strategy reduces, thanks to the effect of Theta!
- Graph 3 (bottom right)** - If you expect a moderate move during the 2<sup>nd</sup> half of the series, and you expect the move to happen over the next **10 days** then the best strikes to opt are slightly OTM (1 strike away from ATM)
- Graph 4 (bottom left)** - If you expect a moderate move during the 2<sup>nd</sup> half of the series, and you expect the move to happen on **expiry day**, then the best strikes to opt are ATM i.e 8000 (lower strike, long) and 8300 (higher strike, short). Do note, far OTM options lose money even if the market moves up.

## 2.3 – Creating Spreads

Here is something you should know, wider the spread, higher is the amount of money you can potentially make, but as a trade off the breakeven also increases.

To illustrate –

Today is 28<sup>th</sup> November, the first day of the December series. Nifty spot is at 7883, consider 3 different bull call spreads –

### Set 1 – Bull call spread with ITM and ATM strikes

|  |                     |
|--|---------------------|
| <b>Lower Strike (ITM, Long)</b>        | <b>7700</b>         |
| <b>Higher Strike (ATM, short)</b>      | 7800                |
| <b>Spread</b>                          | $7800 - 7700 = 100$ |
| <b>Lower Strike Premium Paid</b>       | 296                 |
| <b>Higher Strike Premium Received</b>  | 227                 |
| <b>Net Debit</b>                       | $296 - 227 = 69$    |
| <b>Max Loss (same as net debit)</b>    | 69                  |
| <b>Max Profit (Spread – Net Debit)</b> | $100 - 69 = 31$     |
| <b>Breakeven</b>                       | $7700 + 69 = 7769$  |

|                |  |
|----------------|--|
| <b>Remarks</b> | Considering the outlook is moderately bullish,<br>7769 breakeven is easily achievable,<br>however the max profit is 31,<br>skewing the risk (69 pts) to reward (31 pts) ratio. |
|----------------|--|

### Set 2 – Bull call spread with ATM and OTM strikes (classic combo)

|  |  |
|--|--|
| <b>Lower Strike (ATM, Long)</b>        | <b>7800</b>  |
| <b>Higher Strike (ATM, short)</b>      | 7900   |
| <b>Spread</b>                          | $7900 - 7800 = 100$                                |
| <b>Lower Strike Premium Paid</b>       | 227  |
| <b>Higher Strike Premium Received</b>  | 167  |
| <b>Net Debit</b>                       | $227 - 167 = 60$                                   |
| <b>Max Loss (same as net debit)</b>    | 60   |
| <b>Max Profit (Spread – Net Debit)</b> | $100 - 60 = 40$                                    |
| <b>Breakeven</b>                       | $7800 + 60 = 7860$                                 |
| <b>Remarks</b>                         | Risk reward is better, but the breakeven is higher |

### Set 3 – Bull call spread with OTM and OTM strikes

|  |  |
|--|--|
| <b>Lower Strike (ATM, Long)</b>        | <b>7900</b>  |
| <b>Higher Strike (ATM, short)</b>      | 8000   |
| <b>Spread</b>                          | $8000 - 7900 = 100$                                    |
| <b>Lower Strike Premium Paid</b>       | 167  |
| <b>Higher Strike Premium Received</b>  | 116  |
| <b>Net Debit</b>                       | $167 - 116 = 51$                                       |
| <b>Max Loss (same as net debit)</b>    | 51   |
| <b>Max Profit (Spread – Net Debit)</b> | $100 - 51 = 49$  |
| <b>Breakeven</b>                       | $7900 + 51 = 7951$                                     |
| <b>Remarks</b>                         | Risk reward is attractive, but the breakeven is higher |

So the point is that, the risk reward changes based on the strikes that you choose. However don't just let the risk reward dictate the strikes that you choose. Do note you can create a bull call spread with 2 options, for example - buy 2 ATM options and sell 2 OTM options.

Like other things in options trading, do consider the Greeks, Theta in particular!

I suppose this chapter has laid a foundation for understanding basic ‘spreads’. Going forward I will assume you are familiar with what a moderately bullish/bearish move would mean, hence I would probably start directly with the strategy notes.

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### **Key takeaways from this chapter**

1. A moderate move would mean you expect a movement in the stock/index but the outlook is not too aggressive
2. One has to quantify ‘moderate’ by evaluating the volatility of the stock/index
3. Bull Call spread is a basic spread that you can set up when the outlook is moderately bullish
4. Classic bull call spread involves buying ATM option and selling OTM option – all belonging to same expiry, same underlying, and equal quantity
5. The theta plays an important role in strike selection
6. The risk reward gets skewed based on the strikes you choose

[Download](#) the Bull Call Spread Excel sheet.

# Bull Put Spread



## 3.1 – Why Bull Put Spread?

Similar to the Bull Call Spread, the Bull Put Spread is a two leg option strategy invoked when the view on the market is ‘moderately bullish’. The Bull Put Spread is similar to the Bull Call Spread in terms of the payoff structure; however there are a few differences in terms of strategy execution and strike selection. The bull put spread involves creating a spread by employing ‘Put options’ rather than ‘Call options’ (as is the case in bull call spread).

You may have a fundamental question at this stage – when the payoffs from both Bull call spread and Bull Put spread are similar, why should one choose a certain strategy over the other?

Well, this really depends on how attractive the premiums are. While the Bull Call spread is executed for a **debit**, the bull put spread is executed for a **credit**. So if you are at a point in the market where –

1. The markets have declined considerably (therefore PUT premiums have swelled)
2. The volatility is on the higher side
3. There is plenty of time to expiry

And you have a moderately bullish outlook looking ahead, then it makes sense to invoke a Bull Put Spread for a net credit as opposed to invoking a Bull Call Spread for a net debit. Personally I do prefer strategies which offer net credit rather than strategies which offer net debit.

## 3.2 – Strategy Notes

The bull put spread is a two leg spread strategy traditionally involving ITM and OTM Put options. However you can create the spread using other strikes as well.

To implement the bull put spread –

1. Buy 1 OTM Put option (leg 1)
2. Sell 1 ITM Put option (leg 2)

When you do this ensure –

1. All strikes belong to the same underlying
2. Belong to the same expiry series
3. Each leg involves the same number of options

For example –

Date – 7<sup>th</sup> December 2015

Outlook – Moderately bullish (expect the market to go higher)

Nifty Spot – 7805

Bull Put Spread, trade set up -

1. **Buy 7700 PE** by paying Rs.72/- as premium; do note this is an OTM option. Since money is going out of my account this is a debit transaction
2. **Sell 7900 PE** and receive Rs.163/- as premium, do note this is an ITM option. Since I receive money, this is a credit transaction
3. The net cash flow is the difference between the debit and credit i.e  $163 - 72 = +91$ , since this is a positive cashflow, there is a net credit to my account.

Generally speaking in a bull put spread there is always a ‘net credit’, hence the bull put spread is also called referred to as a ‘Credit spread’.

After we initiate the trade, the market can move in any direction and expiry at any level. Therefore let us take up a few scenarios to get a sense of what would happen to the bull put spread for different levels of expiry.

### **Scenario 1 - Market expires at 7600 (below the lower strike price i.e OTM option)**

The value of the Put options at expiry depends upon its intrinsic value. If you recall from the previous module, the intrinsic value of a put option upon expiry is –

$$\text{Max} [\text{Strike-Spot}, 0]$$

In case of 7700 PE, the intrinsic value would be –

$$\text{Max} [7700 - 7600 - 0]$$

$$= \text{Max} [100, 0]$$

$$= 100$$

Since we are long on the 7700 PE by paying a premium of Rs.72, we would make

$$= \text{Premium Paid} - \text{Intrinsic Value}$$

$$= 100 - 72$$

$$= 28$$

Likewise, in case of the 7900 PE option it has an intrinsic value of 300, but since we have sold/written this option at Rs.163

Payoff from 7900 PE this would be –

$$163 - 300$$

$$= - \mathbf{137}$$

Overall strategy payoff would be –

$$+ 28 - 137$$

$$= - \mathbf{109}$$

### **Scenario 2 - Market expires at 7700 (at the lower strike price i.e the OTM option)**

The 7700 PE will not have any intrinsic value, hence we will lose all the premium that we have paid i.e Rs.72.

The 7900 PE's intrinsic value will be Rs.200.

Net Payoff from the strategy would be –

Premium received from selling 7900PE - Intrinsic value of 7900 PE – Premium lost on 7700 PE

$$= 163 - 200 - 72$$

$$= - \mathbf{109}$$

### **Scenario 3 - Market expires at 7900 (at the higher strike price, i.e ITM option)**

The intrinsic value of both 7700 PE and 7900 PE would be 0, hence both the options would expire worthless.

Net Payoff from the strategy would be –

Premium received for 7900 PE - Premium Paid for 7700 PE

$$= 163 - 72$$

$$= + \mathbf{91}$$

#### **Scenario 4 - Market expires at 8000 (above the higher strike price, i.e the ITM option)**

Both the options i.e 7700 PE and 7900 PE would expire worthless, hence the total strategy payoff would be

Premium received for 7900 PE - Premium Paid for 7700 PE

$$= 163 - 72$$

$$= + \mathbf{91}$$

To summarize –

| Market Expiry | 7700 PE (intrinsic value) | 7900 PE (intrinsic value) | Net pay off |
|---------------|---------------------------|---------------------------|-------------|
| 7600          | 100                       | 300                       | -109        |
| 7700          | 0                         | 200                       | -109        |
| 7900          | 0                         | 0                         | 91          |
| 8000          | 0                         | 0                         | 91          |

From this analysis, 3 things should be clear to you –

1. The strategy is profitable as and when the market moves higher
2. Irrespective of the down move in the market, the loss is restricted to Rs.109, the maximum loss also happens to be the difference between “**Spread and net credit**” of the strategy
3. The maximum profit is capped to 91. This also happens to be the **net credit** of the strategy.

We can define the ‘**Spread**’ as -

Spread = Difference between the higher and lower strike price

We can calculate the overall profitability of the strategy for any given expiry value. Here is screenshot of the calculations that I made on the excel sheet –

| <b>Market Expiry</b> | <b>LS - IV</b> | <b>PP</b> | <b>LS Payoff</b> | <b>HS - IV</b> | <b>PR</b> | <b>HS Payoff</b> | <b>Strategy Payoff</b> |
|----------------------|----------------|-----------|------------------|----------------|-----------|------------------|------------------------|
| 7000                 | 700            | -72       | 628              | 900            | 163       | -737             | -109                   |
| 7100                 | 600            | -72       | 528              | 800            | 163       | -637             | -109                   |
| 7200                 | 500            | -72       | 428              | 700            | 163       | -537             | -109                   |
| 7300                 | 400            | -72       | 328              | 600            | 163       | -437             | -109                   |
| 7400                 | 300            | -72       | 228              | 500            | 163       | -337             | -109                   |
| 7500                 | 200            | -72       | 128              | 400            | 163       | -237             | -109                   |
| 7600                 | 100            | -72       | 28               | 300            | 163       | -137             | -109                   |
| 7700                 | 0              | -72       | -72              | 200            | 163       | -37              | -109                   |
| 7800                 | 0              | -72       | -72              | 100            | 163       | 63               | -9                     |
| 7900                 | 0              | -72       | -72              | 0              | 163       | 163              | 91                     |
| 8000                 | 0              | -72       | -72              | 0              | 163       | 163              | 91                     |
| 8100                 | 0              | -72       | -72              | 0              | 163       | 163              | 91                     |
| 8200                 | 0              | -72       | -72              | 0              | 163       | 163              | 91                     |
| 8300                 | 0              | -72       | -72              | 0              | 163       | 163              | 91                     |
| 8400                 | 0              | -72       | -72              | 0              | 163       | 163              | 91                     |
| 8500                 | 0              | -72       | -72              | 0              | 163       | 163              | 91                     |

- *LS – IV --- Lower Strike - Intrinsic value (7700 PE, OTM)*
- *PP --- Premium Paid*
- *LS Payoff --- Lower Strike Payoff*
- *HS-IV --- Higher strike - Intrinsic Value (7900 PE, ITM)*
- *PR --- Premium Received*
- *HS Payoff --- Higher Strike Payoff*

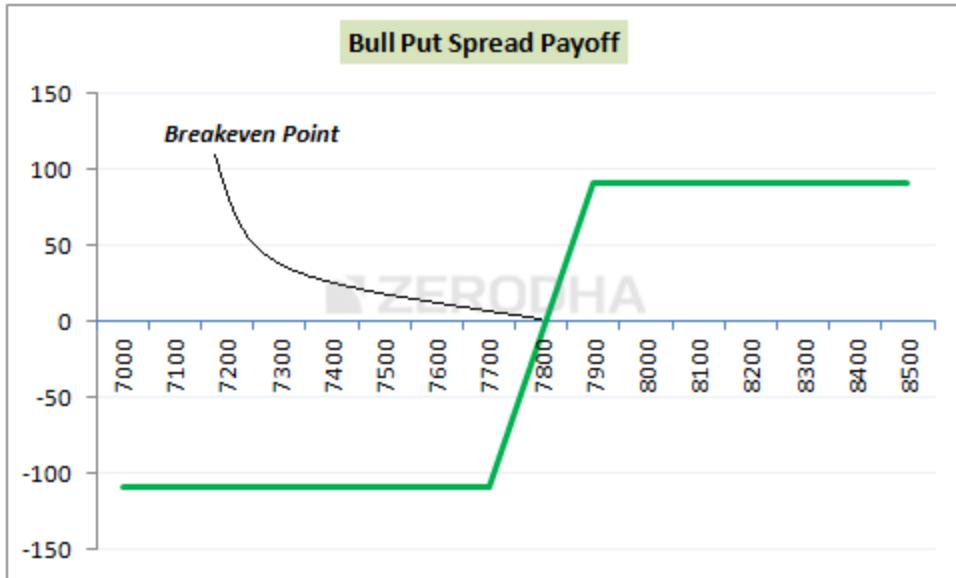
As you can notice, the loss is restricted to Rs.109, and the profit is capped to Rs.91. Given this, we can generalize the Bull Put Spread to identify the Max loss and Max profit levels as -

Bull PUT Spread Max loss = Spread – Net Credit

Net Credit = Premium Received for higher strike – Premium Paid for lower strike

Bull Put Spread Max Profit = Net Credit

This is how the pay off diagram of the Bull Put Spread looks like –



There are three important points to note from the payoff diagram –

1. The strategy makes a loss if Nifty expires below 7700. However the loss is restricted to Rs.109.
2. The breakeven point (where the strategy neither make a profit or loss) is achieved when the market expires at 7809. Therefore we can generalize the breakeven point for a Bull Put spread as **Higher Strike - Net Credit**
3. The strategy makes money if the market moves above 7809, however the maximum profit achievable is Rs.91 i.e the difference between the Premium Received for ITM PE and the Premium Paid for the OTM PE
  1. Premium Paid for 7700 PE = 72
  2. Premium Received for 7900 PE = 163
  3. Net Credit =  $163 - 72 = 91$

### 3.3 – Other Strike combinations

Remember the **spread** is defined as the difference between the two strike prices. The Bull Put Spread is always created with 1 OTM Put and 1 ITM Put option, however the strikes that you choose can be any OTM and any ITM strike. The further these strikes are the larger the spread, the larger the spread the larger is possible reward.

Let us take some examples considering spot is at 7612 –

### Bull Put spread with 7500 PE (OTM) and 7700 PE (ITM)

|   |                                       |
|---|---------------------------------------|
| <b>Lower Strike (OTM, Long)</b>               | <b>7500</b>                           |
| <b>Higher Strike (ITM, short)</b>             | <b>7700</b>                           |
| <b>Spread</b>                                 | <b><math>7700 - 7500 = 200</math></b> |
| <b>Lower Strike Premium Paid</b>              | <b>62</b>                             |
| <b>Higher Strike Premium Received</b>         | <b>137</b>                            |
| <b>Net Credit</b>                             | <b><math>137 - 62 = 75</math></b>     |
| <b>Max Loss (Spread – Net Credit)</b>         | <b><math>200 - 75 = 125</math></b>    |
| <b>Max Profit (Net Credit)</b>                | <b>75</b>                             |
| <b>Breakeven (Higher Strike – Net Credit)</b> | <b><math>7700 - 75 = 7625</math></b>  |

### Bull Put spread with 7400 PE (OTM) and 7800 PE (ITM)

|   |                                       |
|---|---------------------------------------|
| <b>Lower Strike (OTM, Long)</b>               | <b>7400</b>                           |
| <b>Higher Strike (ITM, short)</b>             | <b>7800</b>                           |
| <b>Spread</b>                                 | <b><math>7800 - 7400 = 400</math></b> |
| <b>Lower Strike Premium Paid</b>              | <b>40</b>                             |
| <b>Higher Strike Premium Received</b>         | <b>198</b>                            |
| <b>Net Credit</b>                             | <b><math>198 - 40 = 158</math></b>    |
| <b>Max Loss (Spread – Net Credit)</b>         | <b><math>400 - 158 = 242</math></b>   |
| <b>Max Profit (Net Credit)</b>                | <b>158</b>                            |
| <b>Breakeven (Higher Strike – Net Credit)</b> | <b><math>7800 - 158 = 7642</math></b> |

### Bull Put spread with 7500 PE (OTM) and 7800 PE (ITM)

|   |                                       |
|---|---------------------------------------|
| <b>Lower Strike (OTM, Long)</b>               | <b>7500</b>                           |
| <b>Higher Strike (ITM, short)</b>             | <b>7800</b>                           |
| <b>Spread</b>                                 | <b><math>7800 - 7500 = 300</math></b> |
| <b>Lower Strike Premium Paid</b>              | <b>62</b>                             |
| <b>Higher Strike Premium Received</b>         | <b>198</b>                            |
| <b>Net Credit</b>                             | <b><math>198 - 62 = 136</math></b>    |
| <b>Max Loss (Spread – Net Credit)</b>         | <b><math>300 - 136 = 164</math></b>   |
| <b>Max Profit (Net Credit)</b>                | <b>136</b>                            |
| <b>Breakeven (Higher Strike – Net Credit)</b> | <b><math>7800 - 136 = 7664</math></b> |

So the point here is that, you can create the spread with any combination of OTM and ITM option. However based on the strikes that you choose (and therefore the spread you create), the risk reward ratio changes. In general, if you have a high conviction on a ‘moderately bullish’ view then go ahead and create a larger spread; else stick to a smaller spread.

[\*\*Download\*\*](#) the Bull Put Spread excel.

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### **Key takeaways from this chapter**

1. The Bull Put Spread is an alternative to the Bull Call Spread. Its best executed when the outlook on the market is ‘moderately bullish’
2. Bull Put Spread results in a net credit
3. The Bull Put Spread is best executed when the market has cracked, put premiums are high, the volatility is on the higher side, and you expect the market to hold up (without cracking further)
4. The Bull Put strategy involves simultaneously buying a OTM Put option and selling a ITM Put option
5. Maximum profit is limited to the extent of the net credit
6. Maximum loss is limited to the Spread minus Net credit
7. Breakeven is calculated as Higher Strike – Net Credit
8. One can create the spread by employing any OTM and ITM strikes
9. Higher the spread, higher the profit potential, and higher the breakeven point.

## CHAPTER 4

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# Call Ratio Back Spread

## 4.1 – Background

The Call Ratio Back Spread is an interesting options strategy. I call this interesting keeping in mind the simplicity of implementation and the kind of pay off it offers the trader. This should certainly have a spot in your strategy arsenal. The strategy is deployed when one is out rightly bullish on a stock (or index), unlike the bull call spread or bull put spread where one is moderately bullish.

At a broad level this is what you will experience when you implement the Call Ratio Back Spread-

1. Unlimited profit if the market goes up
2. Limited profit if market goes down
3. A predefined loss if the market stay within a range

In simpler words you can get to make money as long as the market moves in either direction.



Usually, the Call Ratio Back Spread is deployed for a ‘net credit’, meaning money flows into your account as soon as you execute Call Ratio Back Spread. The ‘net credit’ is what you make if the market goes down, as opposed to your expectation (i.e market going up). On the other hand if the market indeed goes up, then you stand to make an unlimited profit. I suppose this should also explain why the call ratio spread is better than buying a plain vanilla call option.

So let's go ahead and figure out how this works.

## 4.2 – Strategy Notes

The Call Ratio Back Spread is a 3 leg option strategy as it involves **buying two OTM call option** and **selling one ITM Call option**. This is the classic 2:1 combo. In fact the call ratio back spread has to be executed in the 2:1 ratio meaning 2 options bought for every one option sold, or 4 options bought for every 2 option sold, so on and so forth.

Let take an example - assume Nifty Spot is at 7743 and you expect Nifty to hit 8100 by the end of expiry. This is clearly a bullish outlook on the market. To implement the Call Ratio Back Spread -

1. Sell **one** lot of 7600 CE (ITM)
2. Buy **two** lots of 7800 CE (OTM)

Make sure –

1. The Call options belong to the same expiry
2. Belongs to the same underlying
3. The ratio is maintained

The trade set up looks like this –

1. 7600 CE, one lot short, the premium received for this is Rs.201/-
2. 7800 CE, two lots long, the premium paid is Rs.78/- per lot, so Rs.156/- for 2 lots
3. Net Cash flow is = Premium Received – Premium Paid i.e  $201 - 156 = 45$  (Net Credit)

With these trades, the call ratio back spread is executed. Let us check what would happen to the overall cash flow of the strategies at different levels of expiry.

Do note we need to evaluate the strategy payoff at various levels of expiry as the strategy payoff is quite versatile.

### **Scenario 1 – Market expires at 7400 (below the lower strike price)**

We know the intrinsic value of a call option (upon expiry) is –

$$\text{Max} [\text{Spot} - \text{Strike}, 0]$$

The 7600 would have an intrinsic value of

$$\text{Max} [7400 - 7600, 0]$$

$$= 0$$

Since we have sold this option, we get to retain the premium received i.e Rs.201

The intrinsic value of 7800 call option would also be zero; hence we lose the total premium paid i.e Rs.78 per lot or Rs.156 for two lots.

Net cash flow would Premium Received – Premium paid

$$= 201 - 156$$

$$= 45$$

### **Scenario 2 – Market expires at 7600 (at the lower strike price)**

The intrinsic value of both the call options i.e 7600 and 7800 would be zero, hence both of them expire worthless.

We get to retain the premium received i.e Rs.201 towards the 7600 CE however we lose Rs.156 on the 7800 CE resulting in a net payoff of **Rs.45**.

### **Scenario 3 – Market expires at 7645 (at the lower strike price plus net credit)**

You must be wondering why I picked the 7645 level, well this is to showcase the fact that the strategy break even is at this level.

The intrinsic value of 7600 CE would be –

$$\text{Max } [\text{Spot} - \text{Strike}, 0]$$

$$= [7645 - 7600, 0]$$

$$= 45$$

Since, we have sold this option for 201 the net pay off from the option would be

$$201 - 45$$

$$= 156$$

On the other hand we have bought two 7800 CE by paying a premium of 156. Clearly the 7800 CE would expire worthless hence, we lose the entire premium.

Net payoff would be –

$$156 - 156$$

= 0

So at 7645 the strategy neither makes money or loses any money for the trader, hence 7645 is treated as a breakeven point for this trade.

#### **Scenario 4 – Market expires at 7700 (half way between the lower and higher strike price)**

The 7600 CE would have an intrinsic value of 100, and the 7800 would have no intrinsic value.

On the 7600 CE we get to retain 101, as we would lose 100 from the premium received of 201 i.e  $201 - 100 = 101$ .

We lose the entire premium of Rs.156 on the 7800 CE, hence the total payoff from the strategy would be

$$= 101 - 156$$

$$= -55$$

#### **Scenario 5 – Market expires at 7800 (at the higher strike price)**

This is an interesting market expiry level, think about it –

1. At 7800 the 7600 CE would have an intrinsic value of 200, and hence we have to let go of the entire premium received i.e 201
2. At 7800, the 7800 CE would expire worthless hence we lose the entire premium paid for the 7800 CE i.e Rs.78 per lot, since we have 2 of these we lose Rs.156

So this is like a ‘double whammy’ point for the strategy!

The net pay off for the strategy is –

Premium Received for 7600 CE – Intrinsic value of 7600 CE – Premium Paid for 7800 CE

$$= 201 - 200 - 156$$

= **-155**

This also happens to be the maximum loss of this strategy.

### **Scenario 6 – Market expires at 7955 (higher strike i.e 7800 + Max loss)**

I've deliberately selected this strike to showcase the fact that at 7955 the strategy breakeven!

But we dealt with a breakeven earlier, you may ask?

Well, this strategy has two breakeven points – one on the lower side (7645) and another one on the upper side i.e 7955.

At 7955 the net payoff from the strategy is –

Premium Received for 7600 CE – Intrinsic value of 7600 CE + (2\* Intrinsic value of 7800 CE) – Premium Paid for 7800 CE

$$= 201 - 355 + (2 * 155) - 156$$

$$= 201 - 355 + 310 - 156$$

$$= \mathbf{0}$$

### **Scenario 7 – Market expires at 8100 (higher than the higher strike price, your expected target)**

The 7600 CE will have an intrinsic value of 500, and the 7800 CE will have an intrinsic value of 300.

The net payoff would be –

Premium Received for 7600 CE – Intrinsic value of 7600 CE + (2\* Intrinsic value of 7800 CE) – Premium Paid for 7800 CE

$$= 201 - 500 + (2 * 300) - 156$$

$$= 201 - 500 + 600 - 156$$

= 145

Here are various other levels of expiry, and the eventual payoff from the strategy. Do note, as the market goes up, so does the profits, but when the market goes down, you still make some money, although limited.

#### Calculations

| Market Expiry | LS - IV | PR  | LS Payoff | HS - IV | PP  | HS Payoff | Strategy Payoff |
|---------------|---------|-----|-----------|---------|-----|-----------|-----------------|
| 7000          | 0       | 201 | 201       | 0       | 156 | -156      | 45              |
| 7100          | 0       | 201 | 201       | 0       | 156 | -156      | 45              |
| 7200          | 0       | 201 | 201       | 0       | 156 | -156      | 45              |
| 7300          | 0       | 201 | 201       | 0       | 156 | -156      | 45              |
| 7400          | 0       | 201 | 201       | 0       | 156 | -156      | 45              |
| 7500          | 0       | 201 | 201       | 0       | 156 | -156      | 45              |
| 7600          | 0       | 201 | 201       | 0       | 156 | -156      | 45              |
| 7700          | 100     | 201 | 101       | 0       | 156 | -156      | -55             |
| 7800          | 200     | 201 | 1         | 0       | 156 | -156      | -155            |
| 7900          | 300     | 201 | -99       | 100     | 156 | 44        | -55             |
| 8000          | 400     | 201 | -199      | 200     | 156 | 244       | 45              |
| 8100          | 500     | 201 | -299      | 300     | 156 | 444       | 145             |
| 8200          | 600     | 201 | -399      | 400     | 156 | 644       | 245             |
| 8300          | 700     | 201 | -499      | 500     | 156 | 844       | 345             |
| 8400          | 800     | 201 | -599      | 600     | 156 | 1044      | 445             |
| 8500          | 900     | 201 | -699      | 700     | 156 | 1244      | 545             |

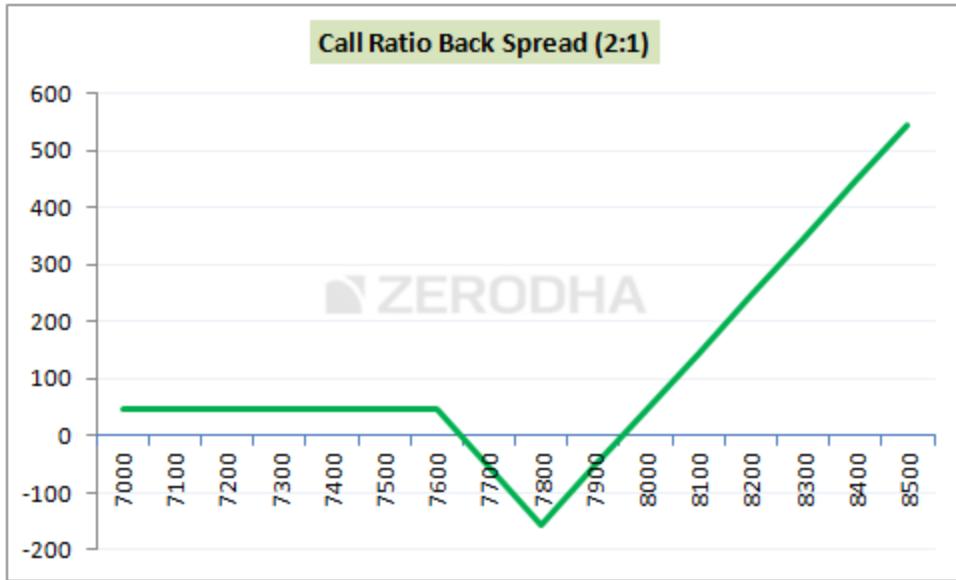


## 4.3 – Strategy Generalization

Going by the above discussed scenarios we can make few generalizations –

- Spread = Higher Strike – Lower Strike
- Net Credit = Premium Received for lower strike – 2\*Premium of higher strike
- Max Loss = Spread – Net Credit
- Max Loss occurs at = Higher Strike
- The payoff when market goes down = Net Credit
- Lower Breakeven = Lower Strike + Net Credit
- Upper Breakeven = Higher Strike + Max Loss

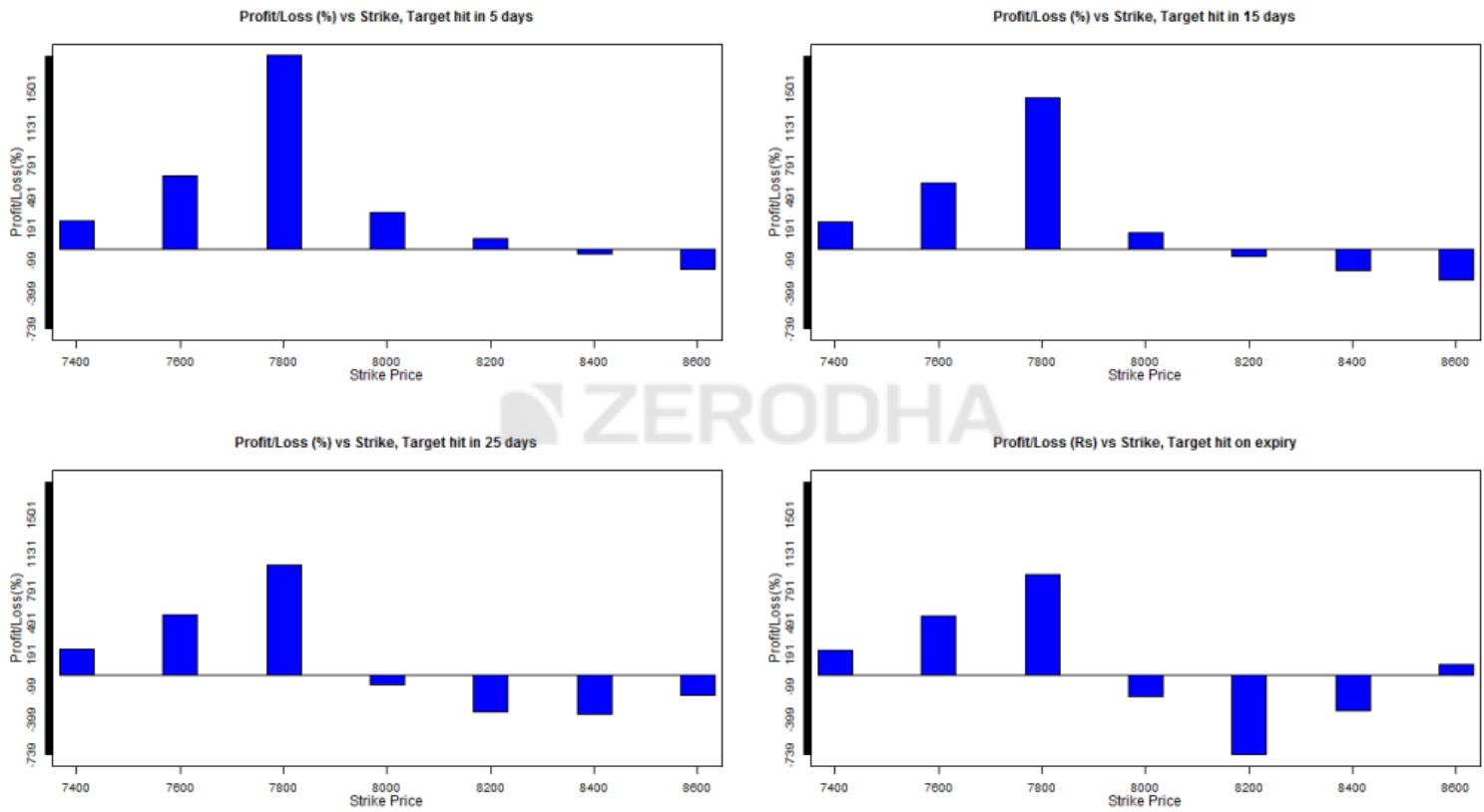
Here is a graph that highlights all these important points –



Notice how the payoff remains flat even when the market goes down, the maximum loss at 7800, and the way the payoff takes off beyond 7955.

## 4.4 – Welcome back the Greeks

I suppose you are familiar with these graphs by now. The following graphs show the profitability of the strategy considering the time to expiry and therefore these graphs help the trader select the right strikes.



Before understanding the graphs above, note the following –

1. Nifty spot is assumed to be at 8000
2. Start of the series is defined as anytime during the first 15 days of the series
3. End of the series is defined as anytime during the last 15 days of the series
4. The Call Ratio Back Spread is optimized and the spread is created with 300 points difference

The thought here is that the market will move up by about 6.25% i.e from 8000 to 8500. So considering the move and the time to expiry, the graphs above suggest –

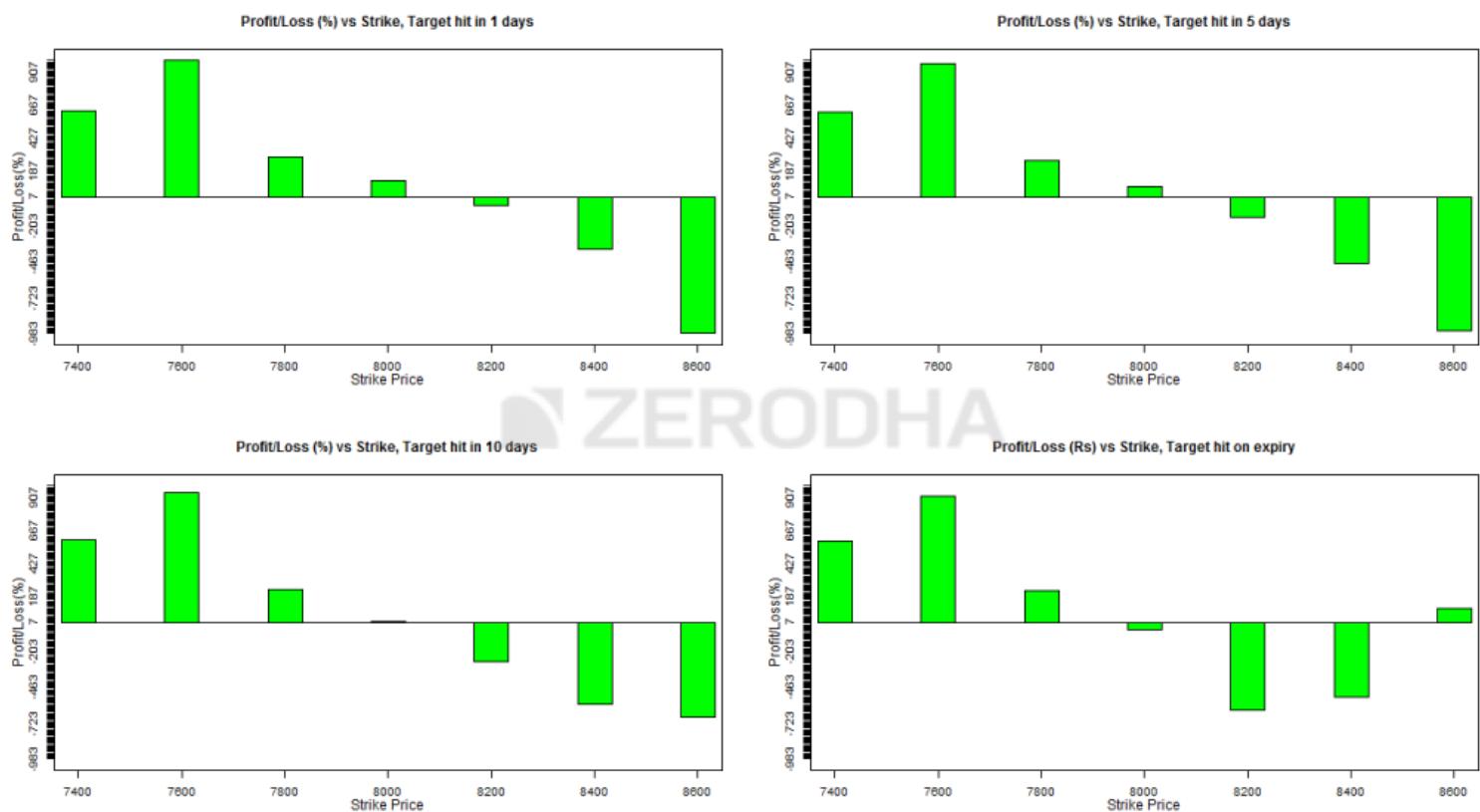
1. **Graph 1 (top left) and Graph 2 (top right)** - You are at the start of the expiry series and you expect the move over the next 5 days (and 15 days in case of Graph 2), then a Call Ratio Spread with 7800 CE (ITM) and 8100 CE (OTM) is the **most profitable** wherein you would sell 7800 CE and buy 2 8100 CE. Do note - even though

you would be right on the direction of movement, selecting other far OTM strikes call options tend to lose money

- Graph 3 (bottom left) and Graph 4 (bottom right) - You are at the start of the expiry series and you expect the move in **25 days** (and expiry day in case of Graph 3), then a Call Ratio Spread with 7800 CE (ITM) and 8100 CE (OTM) is the most profitable wherein you would sell 7800 CE and buy 2 8100 CE.

You must be wondering that the selection of strikes is same irrespective of time to expiry. Well yes, in fact this is the point – Call ratio back spread works best when you sell slightly ITM option and buy slightly OTM option **when there is ample time to expiry**. In fact all other combinations lose money, especially the ones with far OTM options and especially when you expect the target to be achieved closer to the expiry.

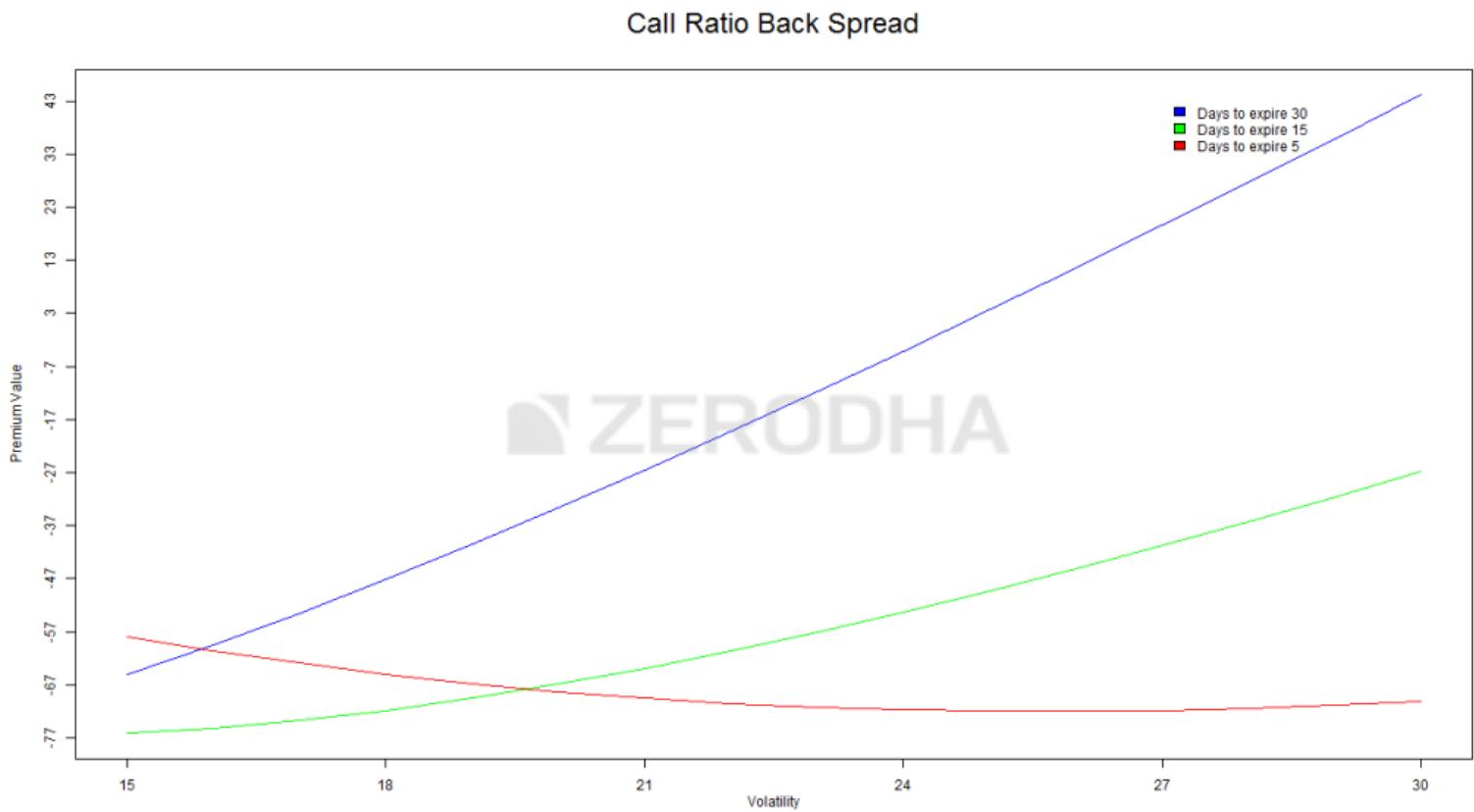
Here are another bunch of charts; the only difference is that the move (i.e 6.25%) occurs during the 2<sup>nd</sup> half of the series -



- Graph 1 (top left) & Graph 2 (top right)** – If you expect the move during the 2<sup>nd</sup> half of the series, and you expect the move to happen within **a day (or within 5 days, graph 2)** then the best strikes to opt are deep ITM and slightly ITM i.e 7600 (lower strike short) and 7900 (higher strike long). Do note, this is not the classic combo of an ITM + OTM spread, instead this is an ITM and ITM spread! In fact all other combinations don't work.
- Graph 3 (bottom right) & Graph 4 (bottom left)** - If you expect the move during the 2<sup>nd</sup> half of the series, and you expect the move to happen within **10 days (or on expiry day, graph 4)** then the best strikes to opt are deep ITM and slightly ITM i.e 7600 (lower strike short) and 7900 (higher strike long). This is similar to what graph 1 and graph 2 suggest.

Again, the point to note here is besides getting the direction right, the strike selection is the key to the profitability of this strategy. One needs to be diligent enough to map the time to expiry to the right strike to make sure that the strategy works in your favor.

What about the effect of volatility on this strategy? Well, volatility plays a key role here, have a look at the image below –



There are three colored lines depicting the change of “net premium” aka the strategy payoff versus change in volatility. These lines help us understand the effect of increase in volatility on the strategy keeping time to expiry in perspective.

1. **Blue Line** – This line suggests that an increase in volatility when there is ample time to expiry (30 days) is beneficial for the Call ratio back spread. As we can see the strategy payoff increases from -67 to +43 when the volatility increase from 15% to 30%. Clearly this means that when there is ample time to expiry, besides being right on the direction of stock/index you also need to have a view on volatility. For this reason, even though I’m bullish on the stock, I would be a bit hesitant to deploy this strategy at the start of the series if the volatility is on the higher side (say more than double of the usual volatility reading)
2. **Green line** - This line suggests that an increase in volatility when there are about 15 days time to expiry is beneficial, although not as much as in the previous case. As we can see the strategy payoff increases from -77 to -47 when the volatility increase from 15% to 30%.
3. **Red line** – This is an interesting, counter intuitive outcome. When there are very few days to expiry, increase in volatility has a negative impact on the strategy! Think about it, increase in volatility when there are few days to expiry enhances the possibility of the option to expiry OTM, hence the premium decreases. So, if you are bullish on a stock / index with few days to expiry, and you also expect the volatility to increase during this period then thread cautiously.

[\*\*Download\*\*](#) the Call Ratio Back spread Excelsheet.

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### Key takeaways from this chapter

1. The Call Ratio Backspread is best executed when your outlook on the stock/index is bullish
2. The strategy requires you to sell 1 ITM CE and buy 2 OTM CE, and this is to be executed in the same ratio i.e for every 1 sold option, 2 options have to be purchased
3. The strategy is usually executed for a ‘net Credit’
4. The strategy makes limited money if the stock price goes down, and unlimited profit if the stock price goes up. The loss is pre defined
5. There are two break even points – lower breakeven and upper breakeven points

6. Spread = Higher Strike – Lower Strike
7. Net Credit = Premium Received for lower strike – 2\*Premium of higher strike
8. Max Loss = Spread – Net Credit
9. Max Loss occurs at = Higher Strike
10. The payoff when market goes down = Net Credit
11. Lower Breakeven = Lower Strike + Net Credit
12. Upper Breakeven = Higher Strike + Max Loss
13. Irrespective of the time to expiry opt for slightly ITM + Slightly OTM combination of strikes
14. Increase in volatility is good for this strategy when there is more time to expiry, but when there is less time to expiry, increase in volatility is not really good for this strategy.



## CHAPTER 5

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# Bear Call Ladder

## 5.1 – Background

The ‘Bear’ in the “Bear Call Ladder” should not deceive you to believe that this is a bearish strategy. The Bear Call Ladder is an improvisation over the Call ratio back spread; this clearly means you implement this strategy when you are out rightly bullish on the stock/index.

In a Bear Call Ladder, the cost of purchasing call options is financed by selling an ‘in the money’ call option. Further, the Bear Call Ladder is also usually setup for a ‘net credit’, where the cash flow is invariably better than the cash flow of the call ratio back spread. However, do note that both these strategies showcase similar payoff structures but differ slightly in terms of the risk structure.

## 5.2 – Strategy Notes

The Bear Call Ladder is a 3 leg option strategy, usually setup for a “net credit”, and it involves –

1. Selling 1 ITM call option
2. Buying 1 ATM call option
3. Buying 1 OTM call option

This is the classic Bear Call Ladder setup, executed in a 1:1:1 combination. The bear Call Ladder has to be executed in the 1:1:1 ratio meaning for every 1 ITM Call option sold, 1 ATM and 1 OTM Call option has to be bought. Other combination like 2:2:2 or 3:3:3 (so on and so forth) is possible.

Let’s take an example - assume Nifty Spot is at 7790 and you expect Nifty to hit 8100 by the end of expiry. This is clearly a bullish outlook on the market. To implement the Bear Call Ladder -

1. Sell 1 ITM Call option
2. Buy 1 ATM Call option
3. Buy 1 OTM Call option

Make sure –

1. The Call options belong to the same expiry
2. Belongs to the same underlying
3. The ratio is maintained

The trade set up looks like this –

1. 7600 CE, one lot short, the premium received for this is Rs.247/-
2. 7800 CE, one lot long, the premium paid for this option is Rs.117/-
3. 7900 CE, one lot long, the premium paid for this option is Rs.70/-
4. The **net credit** would be  $247 - 117 - 70 = 60$

With these trades, the bear call ladder is executed. Let us check what would happen to the overall cash flow of the strategies at different levels of expiry.

Do note we need to evaluate the strategy payoff at various levels of expiry as the strategy payoff is quite versatile.

### **Scenario 1 – Market expires at 7600 (below the lower strike price)**

We know the intrinsic value of a call option (upon expiry) is –

$$\text{Max} [\text{Spot} - \text{Strike}, 0]$$

The 7600 would have an intrinsic value of

$$\text{Max} [7600 - 7600, 0]$$

$$= 0$$

Since we have sold this option, we get to retain the premium received i.e Rs.247/-

Likewise the intrinsic value of 7800 CE and 7900 CE would also be zero; hence we lose the premium paid i.e Rs.117 and Rs.70 respectively.

Net cash flow would Premium Received – Premium paid

$$= 247 - 117 - 70$$

$$= \mathbf{60}$$

### **Scenario 2 – Market expires at 7660 (lower strike + net premium received)**

The 7600 CE would have an intrinsic value of –

$$\text{Max } [\text{Spot} - \text{Strike}, 0]$$

The 7600 would have an intrinsic value of

$$\text{Max } [7660 - 7600, 0]$$

$$= 60$$

Since the 7600 CE is short, we will lose 60 from 247 and retain the balance

$$= 247 - 60$$

$$= 187$$

The 7800 and 7900 CE would expire worthless, hence we lose the premium paid i.e 117 and 70 respectively.

The total strategy payoff would be -

$$= 187 - 117 - 70$$

$$= 0$$

Hence at 7660, the strategy would neither make money nor lose money. Hence this is considered a (lower) breakeven point.

### **Scenario 3 – Market expires at 7700 (between the breakeven point and middle strike i.e 7660 and 7800)**

The intrinsic value of 7600 CE would be –

$\text{Max } [\text{Spot} - \text{Strike}, 0]$

$$= [7700 - 7600, 0]$$

$$= 100$$

Since, we have sold this option for 247 the net pay off from the option would be

$$247 - 100$$

$$= 147$$

On the other hand we have bought 7800 CE and 7900 CE, both of which would expire worthless, hence we lose the premium paid for these options i.e 117 and 70 respectively -

Net payoff from the strategy would be -

$$147 - 117 - 70$$

$$= \textcolor{red}{-40}$$

#### **Scenario 4 – Market expires at 7800 (at the middle strike price)**

Pay attention here, as this is where the tragedy strikes!

The 7600 CE would have an intrinsic value of 200, considering we have written this option for a premium of Rs.247, we stand to lose the intrinsic value which is Rs.200.

Hence on the 7600 CE, we lose 200 and retain -

$$247 - 200$$

$$= 47/-$$

Both 7800 CE and 7900 CE would expire worthless, hence the premium that we paid goes waste, i.e 117 and 70 respectively. Hence our total payoff would be –

$$47 - 117 - 70$$

$$= \textcolor{red}{-140}$$

### **Scenario 5 – Market expires at 7900 (at the higher strike price)**

Pay attention again, tragedy strikes again

The 7600 CE would have an intrinsic value of 300, considering we have written this option for a premium of Rs.247, we stand to lose all the premium value plus more.

Hence on the 7600 CE, we lose -

$$247 - 300$$

$$= -53$$

Both 7800 CE would have an intrinsic value of 100, considering we have paid a premium of Rs.117, the pay off for this option would be -

$$100 - 117$$

$$= -17$$

Finally 7900 CE would expire worthless, hence the premium paid i.e 70 would go waste. The final strategy payoff would be –

$$-53 - 17 - 70$$

$$= \textcolor{red}{-140}$$

Do note, the loss at both 7800 and 7900 is the same.

### **Scenario 6 – Market expires at 8040 (sum of long strike minus short strike minus net premium)**

Similar to the call ratio back spread, the bear call ladder has two breakeven points i.e the upper and lower breakeven. We evaluated the lower breakeven earlier (scenario 2), and this is the upper breakeven point. The upper breakeven is estimated as –

$$(7900 + 7800) - 7600 - 60$$

$$= 15700 - 7600 - 60$$

$$= 8100 - 60$$

$$= 8040$$

Do note, both 7900 and 7800 are strikes we are long on, and 7600 is the strike we are short on. 60 is the net credit.

So at 8040, all the call options would have an intrinsic value –

7600 CE would have an intrinsic value of  $8040 - 7600 = 440$ , since we are short on this at 247, we stand to lose  $247 - 440 = \textcolor{red}{-193}$ .

7800 CE would have an intrinsic value of  $8040 - 7800 = 240$ , since we are long on this at 117, we make  $240 - 117 = \textcolor{black}{+123}$

7900 CE would have an intrinsic value of  $8040 - 7900 = 140$ , since we are long on this at 70, we make  $140 - 70 = \textcolor{black}{+70}$

Hence the total payoff from the Bear Call Ladder would be –

$$\textcolor{black}{-193 + 123 + 70}$$

$$= \mathbf{0}$$

Hence at 8040, the strategy would neither make money nor lose money. Hence this is considered a (upper) breakeven point.

Do note, at 7800 and 7900 the strategy was making a loss and at 8040 the strategy broke even. This should give you a sense that beyond 8040, the strategy would make money. Lets just validate this with another scenario.

### **Scenario 7 – Market expires at 8300**

At 8300 all the call options would have an intrinsic value.

7600 CE would have an intrinsic value of  $8300 - 7600 = 700$ , since we are short on this at 247, we stand to lose  $247 - 700 = \textcolor{red}{-453}$ .

7800 CE would have an intrinsic value of  $8300 - 7800 = 500$ , since we are long on this at 117, we make  $500 - 117 = +383$

7900 CE would have an intrinsic value of  $8300 - 7900 = 400$ , since we are long on this at 70, we make  $400 - 70 = +330$

Hence the total payoff from the Bear Call Ladder would be –

$-453 + 383 + 330$

= **260**

As you can imagine, the higher the market move, the higher is the profit potential. Here is a table that gives you the payoffs at various levels.

**Calculations**

| Market Expiry | LS_IV (ITM) | PR  | Payoff | HS_IV (ATM) | PP   | Payoff | HS_IV (OTM) | PP  | Payoff | Net Payoff |
|---------------|-------------|-----|--------|-------------|------|--------|-------------|-----|--------|------------|
| 7000          | 0           | 247 | 247    | 0           | -117 | -117   | 0           | -70 | -70    | 60         |
| 7100          | 0           | 247 | 247    | 0           | -117 | -117   | 0           | -70 | -70    | 60         |
| 7200          | 0           | 247 | 247    | 0           | -117 | -117   | 0           | -70 | -70    | 60         |
| 7300          | 0           | 247 | 247    | 0           | -117 | -117   | 0           | -70 | -70    | 60         |
| 7400          | 0           | 247 | 247    | 0           | -117 | -117   | 0           | -70 | -70    | 60         |
| 7500          | 0           | 247 | 247    | 0           | -117 | -117   | 0           | -70 | -70    | 60         |
| 7600          | 0           | 247 | 247    | 0           | -117 | -117   | 0           | -70 | -70    | 60         |
| 7700          | 100         | 247 | 147    | 0           | -117 | -117   | 0           | -70 | -70    | -40        |
| 7800          | 200         | 247 | 47     | 0           | -117 | -117   | 0           | -70 | -70    | -140       |
| 7900          | 300         | 247 | -53    | 100         | -117 | -17    | 0           | -70 | -70    | -140       |
| 8000          | 400         | 247 | -153   | 200         | -117 | 83     | 100         | -70 | 30     | -40        |
| 8100          | 500         | 247 | -253   | 300         | -117 | 183    | 200         | -70 | 130    | 60         |
| 8200          | 600         | 247 | -353   | 400         | -117 | 283    | 300         | -70 | 230    | 160        |
| 8300          | 700         | 247 | -453   | 500         | -117 | 383    | 400         | -70 | 330    | 260        |
| 8400          | 800         | 247 | -553   | 600         | -117 | 483    | 500         | -70 | 430    | 360        |
| 8500          | 900         | 247 | -653   | 700         | -117 | 583    | 600         | -70 | 530    | 460        |
| 8600          | 1000        | 247 | -753   | 800         | -117 | 683    | 700         | -70 | 630    | 560        |
| 8700          | 1100        | 247 | -853   | 900         | -117 | 783    | 800         | -70 | 730    | 660        |

Do notice, when the market goes below you stand to make a modest gain of 60 points, but when the market moves up the profits are uncapped.

## 5.3 – Strategy Generalization

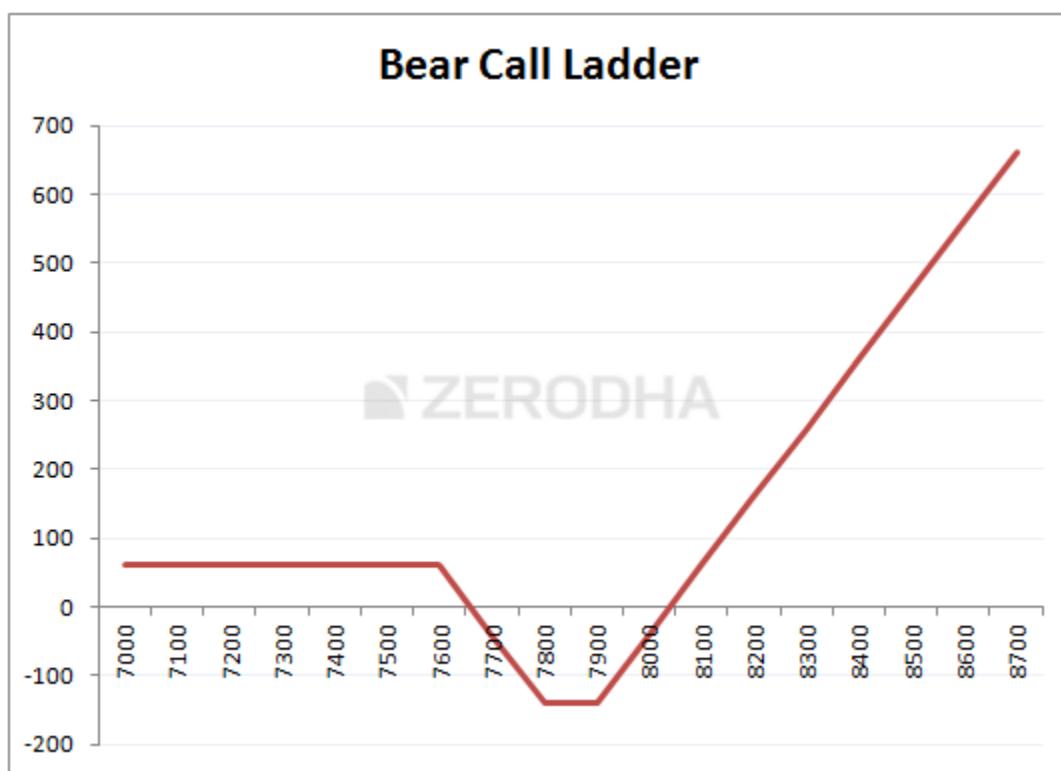
Going by the above discussed scenarios we can make few generalizations –

- Spread = technically this is a ladder and not really a spread. However the 1<sup>st</sup> two option legs creates a classic “spread” wherein we sell ITM and buy ATM. Hence the spread could

be taken as the difference between the ITM and OTM options. In this case it would be 200 ( $7800 - 7600$ )

- Net Credit = Premium Received from ITM CE – Premium paid to ATM & OTM CE
- Max Loss = Spread (difference between the ITM and OTM options) – Net Credit
- Max Loss occurs at = ATM and OTM Strike
- The payoff when market goes down = Net Credit
- Lower Breakeven = Lower Strike + Net Credit
- Upper Breakeven = Sum of Long strike minus short strike minus net premium

Here is a graph that highlights all these important points –

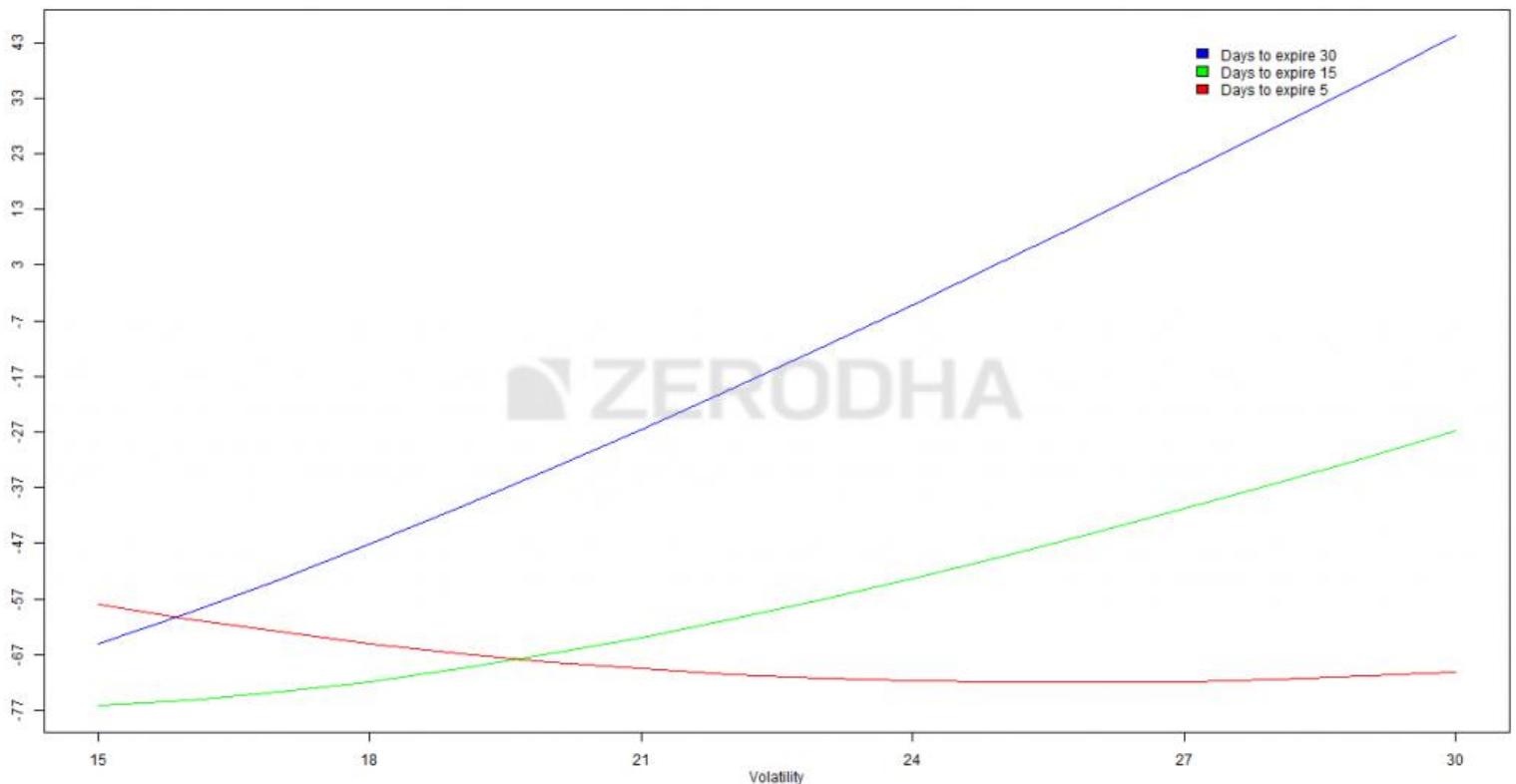


Notice how the strategy makes a loss between 7660 and 8040, but ends up making a huge profit if the market moves past 8040. Even if the market goes down you still end up making a modest profit. But you are badly hit if the market does not move at all. Given this characteristics of the Bear Call Ladder, I would suggest you implement the strategy only when you are absolutely sure that the market will move, irrespective of the direction.

From my experience, I believe this strategy is best executed on stocks (rather than index) when the quarterly results are due.

## 5.4 – Effect of Greeks

The effect of Greeks on this strategy is very similar to the effect of Greeks on Call Ratio Back spread, especially the volatility bit. For your easy reference, I'm reproducing the discussion on volatility we had in the previous chapter.



There are three colored lines depicting the change of “net premium” aka the strategy payoff versus change in volatility. These lines help us understand the effect of increase in volatility on the strategy keeping time to expiry in perspective.

1. **Blue Line** – This line suggests that an increase in volatility when there is ample time to expiry (30 days) is beneficial for the Bear Call Ladder spread. As we can see the strategy payoff increases from -67 to +43 when the volatility increase from 15% to 30%. Clearly this means that when there is ample time to expiry, besides being right on the direction of stock/index you also need to have a view on volatility. For this reason, even though I’m bullish on the stock, I would be a bit hesitant to deploy this strategy at the start of the

series if the volatility is on the higher side (say more than double of the usual volatility reading)

2. **Green line** - This line suggests that an increase in volatility when there are about 15 days time to expiry is beneficial, although not as much as in the previous case. As we can see the strategy payoff increases from -77 to -47 when the volatility increase from 15% to 30%.
3. **Red line** – This is an interesting, counter intuitive outcome. When there are very few days to expiry, increase in volatility has a negative impact on the strategy! Think about it, increase in volatility when there are few days to expiry enhances the possibility of the option to expiry OTM, hence the premium decreases. So, if you are bullish on a stock / index with few days to expiry, and you also expect the volatility to increase during this period then thread cautiously.

[\*\*Download\*\*](#) the Bear Call Ladder excel.

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### **Key takeaways from this chapter**

1. Bear Call Ladder is an improvisation over the Call Ratio Spread
2. Invariably the cost of executing a bear call ladder is better than the Call Ratio Spread, but the range above which the market has to move also becomes large
3. The Bear Call Ladder is executed by selling 1 ITM CE, buying 1 ATM CE, and 1 OTM CE
4. Net Credit = Premium Received from ITM CE – Premium paid to ATM & OTM CE
5. Max Loss = Spread (difference between the ITM and ATM options) – Net Credit
6. Max Loss occurs at = ATM and OTM Strike
7. The payoff when market goes down = Net Credit
8. Lower Breakeven = Lower Strike + Net Credit
9. Upper Breakeven = Sum of Long strike minus short strike minus net premium
10. Execute the strategy only when you are convinced that the market will move significantly higher.

## CHAPTER 6

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# Synthetic Long & Arbitrage

## 6.1 – Background

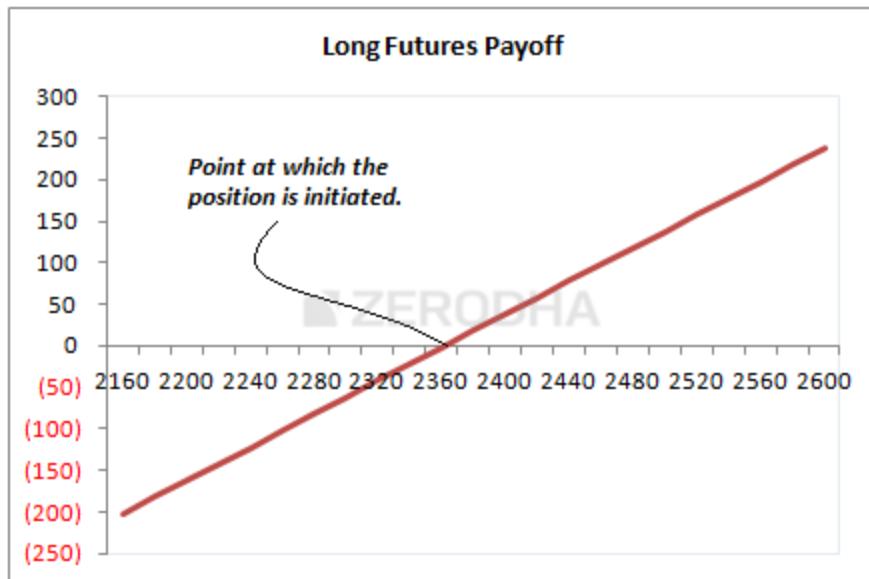
Imagine a situation where you would be required to simultaneously establish a long and short position on Nifty Futures, expiring in the same series. How would you do this and more importantly why would you do this?

We will address both these questions in this chapter. To begin with let us understand how this can be done and later move ahead to understand why one would want to do this (if you are curious, arbitrage is the obvious answer).

Options as you may have realized by now, are highly versatile derivative instruments; you can use these instruments to create any kind of payoff structure including that of the futures (both long and short futures payoff).

In this chapter we will understand how we can artificially replicate a long futures pay off using options. However before we proceed, you may want to just review the long Future's 'linear' payoff [here](#)

Alternatively, here is a quick overview –



As you can see, the long futures position has been initiated at 2360, and at that point you neither make money nor lose money, hence the point at which you initiate the position becomes the breakeven point. You make a profit as the futures move higher than the breakeven point and you make a loss the lower the futures move below the breakeven point. The amount of profit you make for a 10 point up move is exactly the same as the amount of loss you'd make for a 10 point down move. Because of this linearity in payoff, the future is also called a linear instrument.

The idea with a Synthetic Long is to build a similar long Future's payoff using options.

## 6.2 – Strategy Notes

Executing a Synthetic Long is fairly simple; all that one has to do is –

1. Buy the ATM Call Option
2. Sell the ATM Put Option

When you do this, you need to make sure –

1. The options belong to the same underlying
2. Belongs to the same expiry

Let us take an example to understand this better. Assume Nifty is at 7389, which would make 7400 the ATM strike. Synthetic Long would require us to go long on 7400 CE, the premium for this is Rs.107 and we would short the 7400 PE at 80.

The net cash outflow would be the difference between the two premiums i.e  $107 - 80 = 27$ .

Let us consider a few market expiry scenarios –

### **Scenario 1 – Market expires at 7200 (below ATM)**

At 7200, the 7400 CE would expire worthless, hence we would lose the premium paid i.e Rs.107/. However the 7400 PE would have an intrinsic value, which can be calculated as follows –

Intrinsic value of Put Option = Max [Strike-Spot, 0]

$$= \text{Max } [7400 - 7200, 0]$$

$$=\text{Max } [200, 0]$$

$$= 200.$$

Clearly, since we are short on this option, we would lose money from the premium we have received. The loss would be –

$$80 - 200 = -120$$

Total payoff from the long Call and short Put position would be –

$$= -107 - 120$$

$$= \textcolor{red}{-227}$$

### **Scenario 2 – Market expires at 7400 (At ATM)**

If the market expires exactly at 7400, both the options would expire worthless and hence –

1. We lose the premium paid for the 7400 CE option i.e 107
2. We get the retain the premium for the 7400 PE option i.e 80
3. Net payoff from both the positions would be **-27** = 80 – 107

Do note, 27 also happens to be the net cash outflow of the strategy, which is also the difference between the two premiums

### **Scenario 3 – Market expires at 7427 (ATM + Difference between the two premiums)**

7427 is an interesting level, this is the breakeven point for the strategy, where we neither make money nor lose money.

1. 7400 CE – the option is ITM and has an intrinsic value of 27. However we have paid 107 as premium hence we experience a total loss of 80
2. 7400 PE – the option would expire OTM, hence we get to retain the entire premium of 80.
3. On one hand we make 80 and the other we lose 80. Hence we neither make nor lose any money, making 7427 the **breakeven point** for this strategy.

### **Scenario 4 – Market expires at 7600 (above ATM)**

At 7600, the 7400 CE would have an intrinsic value of 200, we would make –

Intrinsic value – Premium

$$= 200 - 107$$

$$= 93$$

The 7400 PE would expire worthless; hence we get to retain the entire premium of Rs.80.

Total payoff from the strategy would be –

$$= 93 + 80$$

$$= 173$$

With the above 4 scenarios, we can conclude that the strategy makes money while the market moves higher and loses money while the market goes lower, similar to futures. However this still does not necessarily mean that the payoff is similar to that of futures. To establish that the synthetic long payoff behaves similar to futures, we need evaluate the payoff of the strategy with reference to the breakeven point; let's say 200 point above and below the breakeven point. If the payoff is identical, then clearly there is linearity in the payoff, similar to futures.

So let's figure this out.

We know the breakeven point for this is –

### **ATM + difference between the premiums**

$$= 7400 + 27$$

$$= \mathbf{7427}$$

The payoff around this point should be symmetric. We will consider  $\mathbf{7427} + \mathbf{200} = \mathbf{7627}$  and  $\mathbf{7427 - 200} = \mathbf{7227}$  for this.

At 7627 –

1. The 7400 CE would have an intrinsic value of 227, hence we get to make  $227 - 107 = 120$
2. The 7400 PE would expire worthless, hence we get to keep the entire premium of 80
3. In all we experience a payoff of  $120 + 80 = \mathbf{200}$

At 7227 –

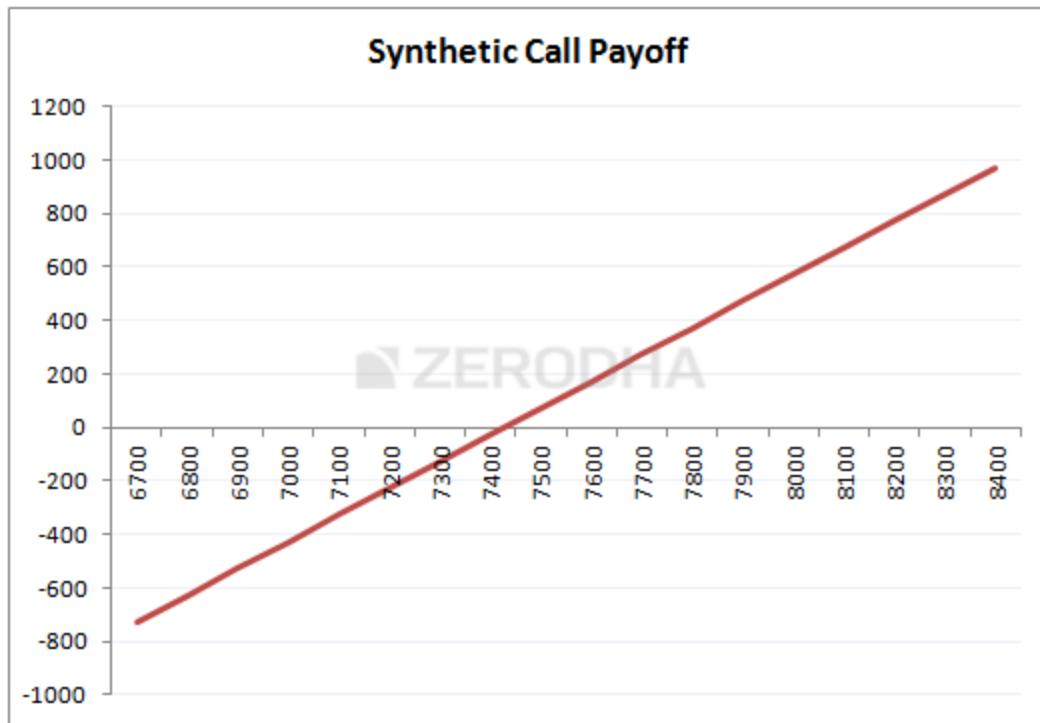
1. The 7400 CE would not have any intrinsic value, hence we lose the entire premium paid i.e 107
2. The 7400 PE would have an intrinsic value of  $7400 - 7227 = 173$ , since we have received 80 as premium the net loss would be  $80 - 173 = -93$ .
3. In all we experience a payoff of  $-93 - 107 = \mathbf{-200}$

Clearly, there is payoff symmetry around the breakeven, and for this reason, the **Synthetic Long mimics the payoff of the long futures instrument.**

Further, here is the payoff at various expiry levels –

| Market Expiry | CE_IV (ATM) | PP  | Payoff | PE_IV (OTM) | PP | Payoff | Net Payoff |
|---------------|-------------|-----|--------|-------------|----|--------|------------|
| 6700          | 0           | 107 | -107   | 700         | 80 | -620   | -727       |
| 6800          | 0           | 107 | -107   | 600         | 80 | -520   | -627       |
| 6900          | 0           | 107 | -107   | 500         | 80 | -420   | -527       |
| 7000          | 0           | 107 | -107   | 400         | 80 | -320   | -427       |
| 7100          | 0           | 107 | -107   | 300         | 80 | -220   | -327       |
| 7200          | 0           | 107 | -107   | 200         | 80 | -120   | -227       |
| 7300          | 0           | 107 | -107   | 100         | 80 | -20    | -127       |
| 7400          | 0           | 107 | -107   | 0           | 80 | 80     | -27        |
| 7500          | 100         | 107 | -7     | 0           | 80 | 80     | 73         |
| 7600          | 200         | 107 | 93     | 0           | 80 | 80     | 173        |
| 7700          | 300         | 107 | 193    | 0           | 80 | 80     | 273        |
| 7800          | 400         | 107 | 293    | 0           | 80 | 80     | 373        |
| 7900          | 500         | 107 | 393    | 0           | 80 | 80     | 473        |
| 8000          | 600         | 107 | 493    | 0           | 80 | 80     | 573        |
| 8100          | 700         | 107 | 593    | 0           | 80 | 80     | 673        |
| 8200          | 800         | 107 | 693    | 0           | 80 | 80     | 773        |
| 8300          | 900         | 107 | 793    | 0           | 80 | 80     | 873        |
| 8400          | 1000        | 107 | 893    | 0           | 80 | 80     | 973        |

And when you plot the Net Payoff, we get the payoff structure which is similar to the long call futures.



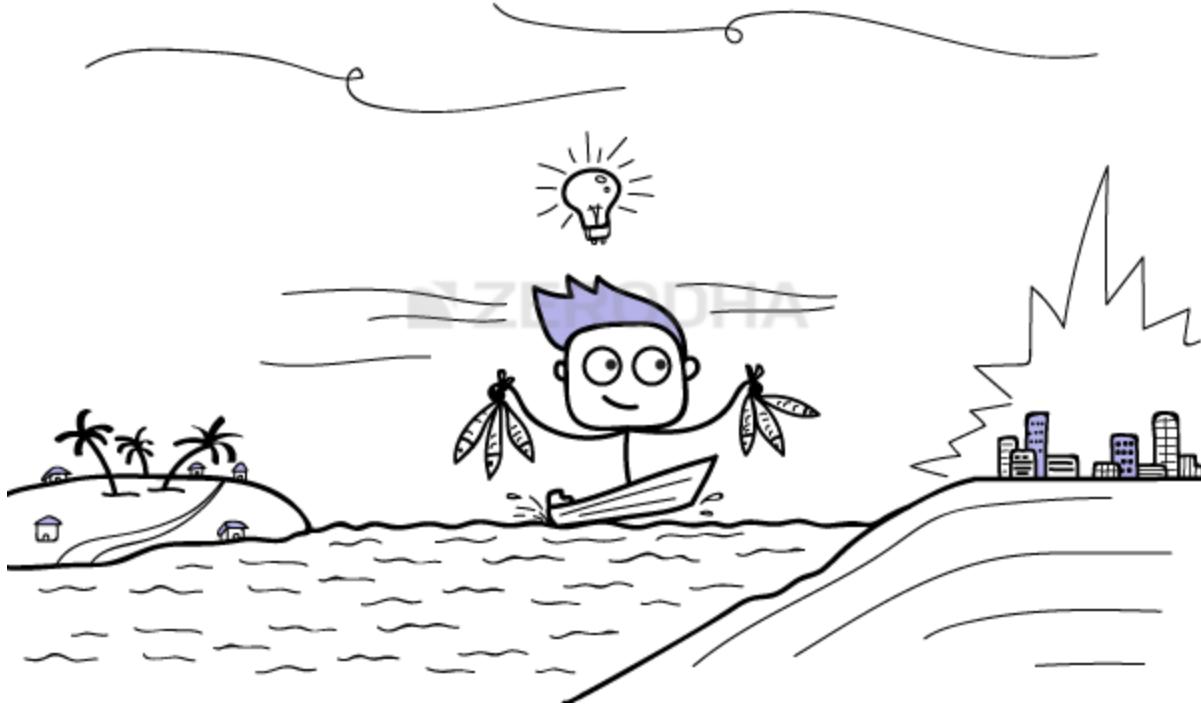
Having figured out how to set up a Synthetic long, we need to figure out the typical circumstances under which setting up a synthetic long is required.

## 6.3 – The Fish market Arbitrage

I'll assume that you have a basic understanding on Arbitrage. In easy words, arbitrage is an opportunity to buy goods/asset in a cheaper market and sell the same in expensive markets and pocket the difference in prices. If executed well, arbitrage trades are almost risk free. Let me attempt to give you a simple example of an arbitrage opportunity.

Assume you live by a coastal city with abundant supply of fresh sea fish, hence the rate at which fish is sold in your city is very low, let's say Rs.100 per Kg. The neighboring city which is 125 kms away has a huge demand for the same fresh sea fish. However, in this neighboring city the same fish is sold at Rs.150 per Kg.

Given this if you can manage to buy the fish from your city at Rs.100 and manage to sell the same in the neighboring city at Rs.150, then in process you clearly get to pocket the price differential i.e Rs.50. Maybe you will have to account for transportation and other logistics, and instead of Rs.50, you get to keep Rs.30/- per Kg. This is still a beautiful deal and this is a typical arbitrage in the fish market!



It looks perfect, think about it - if you can do this everyday i.e buy fish from your city at Rs.100 and sell in the neighboring city at Rs.150, adjust Rs.20 towards expenses then Rs.30 per KG is guaranteed risk free profit.

This is indeed risk free, provides nothing changes. But if things change, so will your profitability, let me list few things that could change -

1. **No Fish (opportunity risk)** – Assume one day you go to the market to buy fish at Rs.100, and you realize there is no fish in the market. Then you have no opportunity to make Rs.30/-.
2. **No Buyers (liquidity risk)** – You buy the fish at Rs.100 and go to the neighboring town to sell the same at Rs.150, but you realize that there are no buyers. You are left holding a bag full of dead fish, literally worthless!
3. **Bad bargaining (execution risk)** – The entire arbitrage opportunity hinges upon the fact that you can ‘always’ bargain to buy at Rs.100 and sell at Rs.150. What if on a bad day you happen to buy at 110 and sell at 140? You still have to pay 20 for transport, this means instead of the regular 30 Rupees profit you get to make only 10 Rupees, and if this continues, then the arbitrage opportunity would become less attractive and you may not want to do this at all.

4. **Transport becomes expensive (cost of transaction)** – This is another crucial factor for the profitability of the arbitrage trade. Imagine if the cost of transportation increases from Rs.20 to Rs.30? Clearly the arbitrage opportunity starts looking less attractive as the cost of execution goes higher and higher. Cost of transaction is a critical factor that makes or breaks an arbitrage opportunity
5. **Competition kicks in (who can drop lower?)** – Given that the world is inherently competitive you are likely to attract some competition who would also like to make that risk free Rs.30. Now imagine this –
  - a. So far you are the only one doing this trade i.e buy fish at Rs.100 and sell at Rs.150
  - b. Your friend notices you are making a risk free profit, and he now wants to copy you. You can't really prevent him as this is a free market.
  - c. Both of you buy at Rs.100, transport it at Rs.20, and attempt to sell it in the neighboring town
  - d. A potential buyer walks in, sees there is a new seller, selling the same quality of fish. Who between the two of you is likely to sell the fish to the buyer?
  - e. Clearly given the fish is of the same quality the buyer will buy it from the one selling the fish at a cheaper rate. Assume you want to acquire the client, and therefore drop the price to Rs.145/-
  - f. Next day your friend also drops the price, and offers to sell fish at Rs.140 per KG, and therefore igniting a price war. In the whole process the price keeps dropping and the arbitrage opportunity just evaporates.
  - g. How low can the price drop? Obviously it can drop to Rs.120 (cost of buying fish plus transport). Beyond 120, it does not make sense to run the business
  - h. Eventually in a perfectly competitive world, competition kicks in and arbitrage opportunity just ceases to exist. In this case, the cost of fish in neighboring town would drop to Rs.120 or a price point in that vicinity.

I hope the above discussion gave you a quick overview on arbitrage. In fact we can define any arbitrage opportunity in terms of a simple mathematical expression, for example with respect to the fish example, here is the mathematical equation –

**[Cost of selling fish in town B - Cost of buying fish in town A] = 20**

If there is an imbalance in the above equation, then we essentially have an arbitrage opportunity. In all types of markets - fish market, agri market, currency market, and

stock market such arbitrage opportunities exist and they are all governed by simple arithmetic equations.

## 6.4 – The Options arbitrage

Arbitrage opportunities exist in almost every market, one needs to be a keen observer of the market to spot it and profit from it. Typically stock market based arbitrage opportunities allow you to lock in a certain profit (small but guaranteed) and carry this profit irrespective of which direction the market moves. For this reason arbitrage trades are quite a favorite with risk intolerant traders.

I would like to discuss a simple arbitrage case here, the roots of which lie in the concept of '**Put Call Parity**'. I will skip discussing the Put Call Parity theory but would instead jump to illustrate one of its applications.

However I'd suggest you watch this beautiful video from Khan Academy to understand the Put Call Parity –

So based on Put Call Parity, here is an arbitrage equation –

**Long Synthetic long + Short Futures = 0**

You can elaborate this to –

**Long ATM Call + Short ATM Put + Short Futures = 0**

The equation states that the P&L upon expiry by virtue of holding a long synthetic long and short future should be zero. Why should this position result in a zero P&L, well the answer to this is attributable to the Put Call Parity.

However, if the P&L is a non zero value, then we have an arbitrage opportunity.

Here is an example that will help you understand this well.

**Quote** As on Jan 21, 2016 13:37:41 IST 

Nifty 50 - NIFTY

| Index Watch | Option Chain

Index Derivatives

Stock Derivatives

Currency Derivatives

Instrument Type:  
Index Futures

Symbol :  
NIFTY

Expiry Date :  
28JAN2016

Option Type :  
Selec

Strike Price :  
Select..

Get Data

**7,316.30**

▲ 9.35 0.13%

Prev. Close

7,306.95

Open

7,364.10

High

7,401.10

Low

7,253.10

Close

-

Fundamentals

Historical Data

Print

Order Book

Intra-day

Traded Volume (contracts) 1,65,922

Traded Value \* (lacs) 9,11,225.37

VWAP 7,322.52

Underlying value 7,304.80

Market Lot 75

Open Interest 2,13,66,825

Change in Open Interest 5,63,250

% Change in Open Interest 2.71

Implied Volatility

| Buy Qty.  | Buy Price      | Sell Price | Sell Qty. |
|-----------|----------------|------------|-----------|
| 300       | 7,316.20       | 7,316.50   | 150       |
| 1,425     | 7,316.00       | 7,316.55   | 75        |
| 75        | 7,315.25       | 7,316.60   | 525       |
| 225       | 7,315.20       | 7,316.65   | 150       |
| 1,050     | 7,315.00       | 7,316.70   | 75        |
| 10,39,125 | Total Quantity |            | 13,96,350 |

+ Cost of Carry

+ Other Information

On 21<sup>st</sup> Jan, Nifty spot was at 7304, and the Nifty Futures was trading at 7316.

|           |         |       |        |        |        |        |        |        |         |        |        |        |       |        |        |       |         |          |
|-----------|---------|-------|--------|--------|--------|--------|--------|--------|---------|--------|--------|--------|-------|--------|--------|-------|---------|----------|
| -21,450   | 2,446   | 23.89 | 319.00 | -0.70  | 225    | 316.25 | 319.95 | 450    | 7000.00 | 975    | 14.05  | 14.20  | 450   | -2.00  | 14.10  | 26.08 | 154,618 | 49,350   |
| -         | 2       | 19.57 | 239.15 | -99.85 | 75     | 203.15 | 383.05 | 4,425  | 7050.00 | 75     | 18.05  | 18.20  | 375   | -2.05  | 18.10  | 25.05 | 7,112   | 106,275  |
| 158,400   | 5,998   | 19.39 | 228.25 | 0.45   | 75     | 226.40 | 229.50 | 75     | 7100.00 | 225    | 23.35  | 23.60  | 1,125 | -3.10  | 23.40  | 23.93 | 234,664 | 419,100  |
| 525       | 370     | 20.82 | 162.00 | -25.50 | 75     | 180.40 | 191.20 | 75     | 7150.00 | 375    | 30.40  | 30.70  | 75    | -3.45  | 30.95  | 23.09 | 13,313  | 54,300   |
| -55,650   | 43,224  | 19.60 | 145.00 | -0.50  | 75     | 144.90 | 145.40 | 75     | 7200.00 | 75     | 41.05  | 41.20  | 600   | -4.30  | 41.20  | 22.01 | 373,480 | 459,225  |
| 175,200   | 9,838   | 18.20 | 109.00 | -0.75  | 150    | 108.25 | 109.15 | 150    | 7250.00 | 150    | 54.55  | 54.85  | 75    | -4.40  | 54.80  | 21.19 | 37,144  | 170,325  |
| 873,450   | 232,896 | 18.57 | 79.40  | -1.70  | 750    | 78.95  | 79.50  | 75     | 7300.00 | 300    | 73.85  | 74.30  | 300   | -5.10  | 74.25  | 20.57 | 371,024 | 578,250  |
| 280,875   | 36,476  | 18.24 | 54.80  | -2.40  | 150    | 54.75  | 55.20  | 150    | 7350.00 | 450    | 95.60  | 97.10  | 150   | -4.75  | 96.40  | 19.71 | 16,894  | 67,875   |
| 1,342,725 | 462,621 | 18.10 | 36.15  | -1.65  | 75     | 36.20  | 36.40  | 300    | 7400.00 | 225    | 127.45 | 128.05 | 150   | -3.80  | 127.45 | 19.59 | 160,081 | 59,925   |
| 60,150    | 38,792  | 17.98 | 22.60  | -0.95  | 225    | 22.65  | 22.85  | 975    | 7450.00 | 150    | 162.10 | 165.65 | 300   | 3.55   | 163.70 | 21.72 | 1,217   | -9,375   |
| 654,225   | 363,141 | 17.92 | 13.50  | -1.30  | 1,425  | 13.45  | 13.65  | 2,100  | 7500.00 | 12,150 | 204.00 | 205.50 | 150   | -4.95  | 204.30 | 19.80 | 31,169  | -145,650 |
| 46,275    | 34,627  | 18.02 | 7.45   | -1.75  | 150    | 7.45   | 7.50   | 150    | 7550.00 | 150    | 243.50 | 250.40 | 150   | -4.35  | 245.00 | 18.99 | 272     | -3,075   |
| 366,075   | 219,831 | 18.53 | 4.45   | -1.30  | 1,350  | 4.45   | 4.50   | 1,275  | 7600.00 | 150    | 293.35 | 295.00 | 75    | -6.05  | 294.90 | 23.99 | 8,126   | -2,550   |
| 23,175    | 17,070  | 19.55 | 2.95   | -0.90  | 3,300  | 2.90   | 3.00   | 225    | 7650.00 | 150    | 335.90 | 341.85 | 150   | 8.45   | 342.30 | 25.10 | 203     | -2,925   |
| -118,050  | 123,734 | 20.45 | 2.05   | -0.75  | 21,975 | 2.00   | 2.05   | 1,500  | 7700.00 | 150    | 390.10 | 391.35 | 150   | 0.60   | 393.35 | 25.33 | 5,910   | -4,500   |
| -26,775   | 6,195   | 22.12 | 1.90   | -0.60  | 675    | 1.85   | 1.95   | 1,575  | 7750.00 | 150    | 435.55 | 448.35 | 1,875 | -4.60  | 439.10 | 29.90 | 54      | -375     |
| -74,250   | 55,273  | 23.58 | 1.65   | -0.20  | 37,950 | 1.60   | 1.65   | 35,475 | 7800.00 | 150    | 490.60 | 491.95 | 75    | 4.15   | 490.95 | 29.20 | 1,850   | -29,400  |
| -23,175   | 2,222   | 25.30 | 1.65   | -0.25  | 375    | 1.65   | 1.70   | 825    | 7850.00 | 300    | 531.10 | 542.05 | 300   | -20.00 | 580.00 | 34.93 | 19      | -225     |
| -102,675  | 21,261  | 26.83 | 1.40   | -0.15  | 47,100 | 1.40   | 1.45   | 4,500  | 7900.00 | 75     | 588.85 | 590.00 | 225   | -4.45  | 589.00 | -     | 1,939   | -35,475  |
| -5,925    | 831     | 28.74 | 1.40   | -0.40  | 150    | 1.40   | 1.55   | 150    | 7950.00 | 75     | 629.55 | 642.40 | 300   | 29.00  | 674.00 | 32.85 | 23      | -750     |
| -57,750   | 8,926   | 30.03 | 1.20   | -0.15  | 14,550 | 1.20   | 1.25   | 300    | 8000.00 | 300    | 688.45 | 690.00 | 75    | -2.90  | 689.00 | 36.69 | 1,656   | -5,100   |

The 7300 CE and PE (ATM options) were trading at 79.5 and 73.85 respectively. Do note, all the contracts belong to the January 2016 series.

Going by the arbitrage equation stated above, if one were to execute the trade, the positions would be –

1. Long 7300 CE @ 79.5
2. Short 7300 PE @ 73.85
3. Short Nifty futures @ 7316

Do note, the first two positions together form a long synthetic long. Now as per the arbitrage equation, upon expiry the positions should result in a zero P&L. Let's evaluate if this holds true.

### Scenario 1 – Expiry at 7200

- The 7300 CE would expire worthless, hence we lose the premium paid i.e **79.5**
- The 7300 PE would have an intrinsic value of 100, but since we are short at 73.85, the net payoff would be  $73.85 - 100 = -26.15$

- We are short on futures at 7316, which would result in a profit of 116 points ( $7316 - 7200$ )
- Net payoff would be  $-79.5 - 26.15 + 116 = +10.35$

Clearly, instead of a 0 payoff, we are experiencing a positive non zero P&L.

### **Scenario 2 – Expiry at 7300**

- The 7300 CE would expire worthless, hence we lose the premium paid i.e **79.5**
- The 7300 PE would expire worthless, hence we get to retain 73.85
- We are short on futures at 7316, which would result in a profit of 16 points ( $7316 - 7300$ )
- Net payoff would be  $-79.5 + 73.85 + 16 = +10.35$

### **Scenario 3 – Expiry at 7400**

- The 7300 CE would have an intrinsic value of 100, and therefore the payoff would be  $100 - 79.5 = 20.5$
- The 7300 PE would expire worthless, hence we get to retain 73.85
- We are short on futures at 7316, which would result in loss of 84 points ( $7316 - 7400$ )
- Net payoff would be  $20.5 + 73.85 - 84 = +10.35$

You could test this across any expiry value (in other words the markets can move in any direction) but you are likely to pocket 10.35 points, **upon expiry**. I'd like to stress this again; this arbitrage lets you make 10.35, upon expiry.

Here is the payoff structure at different expiry values –

| Market Expiry | CE_IV (ATM) | PP   | Payoff | PE_IV (OTM) | PP    | Payoff  | Fut Payoff | Net Payoff |
|---------------|-------------|------|--------|-------------|-------|---------|------------|------------|
| 6700          | 0           | 79.5 | -79.5  | 600         | 73.85 | -526.15 | 616        | 10.35      |
| 6800          | 0           | 79.5 | -79.5  | 500         | 73.85 | -426.15 | 516        | 10.35      |
| 6900          | 0           | 79.5 | -79.5  | 400         | 73.85 | -326.15 | 416        | 10.35      |
| 7000          | 0           | 79.5 | -79.5  | 300         | 73.85 | -226.15 | 316        | 10.35      |
| 7100          | 0           | 79.5 | -79.5  | 200         | 73.85 | -126.15 | 216        | 10.35      |
| 7200          | 0           | 79.5 | -79.5  | 100         | 73.85 | -26.15  | 116        | 10.35      |
| 7300          | 0           | 79.5 | -79.5  | 0           | 73.85 | 73.85   | 16         | 10.35      |
| 7400          | 100         | 79.5 | 20.5   | 0           | 73.85 | 73.85   | -84        | 10.35      |
| 7500          | 200         | 79.5 | 120.5  | 0           | 73.85 | 73.85   | -184       | 10.35      |
| 7600          | 300         | 79.5 | 220.5  | 0           | 73.85 | 73.85   | -284       | 10.35      |
| 7700          | 400         | 79.5 | 320.5  | 0           | 73.85 | 73.85   | -384       | 10.35      |
| 7800          | 500         | 79.5 | 420.5  | 0           | 73.85 | 73.85   | -484       | 10.35      |
| 7900          | 600         | 79.5 | 520.5  | 0           | 73.85 | 73.85   | -584       | 10.35      |
| 8000          | 700         | 79.5 | 620.5  | 0           | 73.85 | 73.85   | -684       | 10.35      |
| 8100          | 800         | 79.5 | 720.5  | 0           | 73.85 | 73.85   | -784       | 10.35      |
| 8200          | 900         | 79.5 | 820.5  | 0           | 73.85 | 73.85   | -884       | 10.35      |
| 8300          | 1000        | 79.5 | 920.5  | 0           | 73.85 | 73.85   | -984       | 10.35      |
| 8400          | 1100        | 79.5 | 1020.5 | 0           | 73.85 | 73.85   | -1084      | 10.35      |

Interesting isn't it? But what's the catch you may ask?

Transaction charges!

One has to account for the cost of execution of this trade and figure out if it still makes sense to take up the trade. Consider this –

- **Brokerage** – if you are trading with a traditional broker, then you will be charged on a percentage basis which will eat away your profits. So on one hand you make 10 points, but you may end up paying 8 – 10 points as brokerage. However if you were to do this trade with a discount broker like Zerodha, your breakeven on this trade would be around 4-5 points. This should give you more reason to open your account with Zerodha
- **STT** – Do remember the P&L is realised upon expiry; hence you would have to carry forward your positions to expiry. If you are long on an ITM option (which you will be) then upon expiry you will have to pay a hefty STT, which will further eat away your profits. Please do [read this](#) to know more.
- **Other applicable taxes** – Besides you also have to account for service tax, stamp duty etc

So considering these costs, the efforts to carry an arbitrage trade for 10 points may not make sense. But it certainly would, if the payoff was something better, maybe like 15 or

20 points. With 15 or 20 points you can even maneuver the STT trap by squaring off the positions just before expiry - although it will shave off a few points.

[\*\*Download\*\*](#) the Synthetic long & Arbitrage excel.

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### Key takeaways from this chapter

1. You can use options to replicate futures payoff
2. A synthetic long replicates the long futures payoff
3. Simultaneously buying ATM call and selling ATM Put creates a synthetic long
4. The breakeven point for the synthetic long is the **ATM strike + net premium paid**
5. An arbitrage opportunity is created when Synthetic long + short futures yields a positive non zero P&L upon expiry
6. Execute the arbitrage trade only if the P&L upon expiry makes sense after accounting for expenses.



## CHAPTER 7

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# Bear Put Spread

## 7.1 – Spreads versus naked positions

Over the last five chapters we've discussed various multi leg bullish strategies. These strategies ranged to suit an assortment of market outlook - from an outrightly bullish market outlook to moderately bullish market outlook. Reading through the last 5 chapters you must have realised that most professional options traders prefer initiating a spread strategy versus taking on naked option positions. No doubt, spreads tend to shrink the overall profitability, but at the same time spreads give you a greater visibility on risk. Professional traders value 'risk visibility' more than the profits. In simple words, it's a much better deal to take on smaller profits as long as you know what would be your maximum loss under worst case scenarios.

Another interesting aspect of spreads is that invariably there is some sort of financing involved, wherein the purchase of an option is funded by the sale of another option. In fact, financing is one of the key aspects that differentiate a spread versus a normal naked directional position. Over the next few chapters we will discuss strategies which you can deploy when your outlook ranges from moderately bearish to out rightly bearish. The composition of these strategies is similar to the bullish strategies that we discussed earlier in the module.

The first bearish strategy we will look into is the Bear Put Spread, which as you may have guessed is the equivalent of the Bull Call Spread.



## 7.2 – Strategy notes

Similar to the Bull Call Spread, the Bear Put Spread is quite easy to implement. One would implement a bear put spread when the market outlook is moderately bearish, i.e you expect the market to go down in the near term while at the same time you don't expect it to go down much. If I were to quantify 'moderately bearish', a 4-5% correction would be apt. By invoking a bear put spread one would make a modest gain if the markets correct (go down) as expected but on the other hand if the markets were to go up, the trader will end up with a limited loss.

A conservative trader (read as risk averse trader) would implement Bear Put Spread strategy by simultaneously –

1. Buying an In the money Put option
2. Selling an Out of the Money Put option

There is no compulsion that the Bear Put Spread has to be created with an ITM and OTM option. The Bear Put spread can be created employing any two put options. The choice of strike depends on the aggressiveness of the trade. However do note that both the options should belong to the same expiry and same underlying. To understand the

implementation better, let's take up an example and see how the strategy behaves under different scenarios.

As of today Nifty is at 7485, this would make 7600 PE In the money and 7400 PE Out of the money. The 'Bear Put Spread' would require one to sell 7400 PE, the premium received from the sale would partially finance the purchase of the 7600 PE. The premium paid (PP) for the 7600 PE is Rs.165, and the premium received (PR) for the 7400 PE is Rs.73/- . The net debit for this transaction would be –

$$73 - 165$$

$$= \textcolor{red}{-92}$$

To understand how the payoff of the strategy works under different expiry circumstances, we need to consider different scenarios. Please do bear in mind the payoff is upon expiry, which means to say that the trader is expected to hold these positions till expiry.

### **Scenario 1 – Market expires at 7800 (above long put option i.e 7600)**

This is a case where the market has gone up as opposed to the expectation that it would go down. At 7800 both the put option i.e 7600 and 7400 would not have any intrinsic value, hence they would expire worthless.

- The premium paid for 7600 PE i.e Rs.165 would go to 0, hence we retain nothing
- The premium received for 7400 PE i.e Rs.73 would be retained entirely
- Hence at 7800, we would lose Rs.165 on one hand but this would be partially offset by the premium received i.e Rs.73
- The overall loss would be  $-165 + 73 = \textcolor{red}{-92}$

Do note the '-ve' sign associated with 165 indicates that this is a money outflow from the account, and the '+ve' sign associated with 73 indicates that the money is received into the account.

Also, the net loss of 92 is equivalent to the net debit of the strategy.

### **Scenario 2 – Market expired at 7600 (at long put option)**

In this scenario we assume the market expires at 7600, where we have purchased a Put option. But then, at 7600 both 7600 and 7400 PE would expire worthless (similar to scenario 1) resulting in a loss of **-92.**

### **Scenario 3 – Market expires at 7508 (breakeven)**

7508 is half way through 7600 and 7400, and as you may have guessed I've picked 7508 specifically to showcase that the strategy neither makes money nor loses any money at this specific point.

- The 7600 PE would have an intrinsic value equivalent to  $\text{Max}[7600 - 7508, 0]$ , which is 92.
- Since we have paid Rs.165 as premium for the 7600 PE, some of the premium paid would be recovered. That would be  $165 - 92 = 73$ , which means to say the net loss on 7600 PE at this stage would be Rs.73 and not Rs.165
- The 7400 PE would expire worthless, hence we get to retain the entire premium of Rs.73
- So on hand we make 73 (7400 PE) and on the other we lose 73 (7600 PE) resulting in a no loss no profit situation

Hence, 7508 would be the breakeven point for this strategy.

### **Scenario 4 – Market expires at 7400 (at short put option)**

This is an interesting level, do recall when we initiated the position the spot was at 7485, and now the market has gone down as expected. At this point both the options would have interesting outcomes.

- The 7600 PE would have an intrinsic value equivalent to  $\text{Max}[7600 - 7400, 0]$ , which is 200
- We have paid a premium of Rs.165, which would be recovered from the intrinsic value of Rs.200, hence after compensating for the premium paid one would retain Rs.35/-
- The 7400 PE would expire worthless, hence the entire premium of Rs.73 would be retained
- The net profit at this level would be  $35 + 73 = 108$

The net payoff from the strategy is in line with the overall expectation from the strategy i.e the trader gets to make a modest profit when the market goes down.

### **Scenario 5 – Market expires at 7200 (below the short put option)**

This is again an interesting level as both the options would have an intrinsic value. Lets figure out how the numbers add up –

- The 7600 PE would have an intrinsic value equivalent to  $\text{Max}[7600 - 7200, 0]$ , which is 400
- We have paid a premium of Rs.165, which would be recovered from the intrinsic value of Rs.400, hence after compensating for the premium paid one would retain Rs.235/-
- The 7400 PE would have an intrinsic value equivalent to  $\text{Max}[7400 - 7200, 0]$ , which is 200
- We received a premium of Rs.73, however we will have to let go of the premium and bear a loss over and above 73. This would be  $200 - 73 = 127$
- On one hand we make a profit of Rs.235 and on the other we lose 127, therefore the net payoff of the strategy would be  $235 - 127 = 108$ .

Summarizing all the scenarios (I've put up the payoff values directly after considering the premiums)

| Market Expiry | Long Put (7600)_IV | Short Put (7400)_IV | Net payoff |
|---------------|--------------------|---------------------|------------|
| <b>7800</b>   | 0                  | 0                   | -92        |
| <b>7600</b>   | 0                  | 0                   | -92        |
| <b>7508</b>   | 92                 | 0                   | 0          |
| <b>7200</b>   | 400                | 200                 | +108       |

Do note, the net payoff from the strategy is in line with the overall expectation from the strategy i.e the trader gets to make a modest profit when the market goes down while at the same time the losses are capped in case the market goes up.

Have a look at the table below -

| Market Expiry | Long Put_IV | PP   | Long put payoff | Short put_IV | PR | Short put payoff | Strategy Payoff |
|---------------|-------------|------|-----------------|--------------|----|------------------|-----------------|
| 6600          | 1000        | -165 | 835             | 800          | 73 | -727             | 108             |
| 6700          | 900         | -165 | 735             | 700          | 73 | -627             | 108             |
| 6800          | 800         | -165 | 635             | 600          | 73 | -527             | 108             |
| 6900          | 700         | -165 | 535             | 500          | 73 | -427             | 108             |
| 7000          | 600         | -165 | 435             | 400          | 73 | -327             | 108             |
| 7100          | 500         | -165 | 335             | 300          | 73 | -227             | 108             |
| 7200          | 400         | -165 | 235             | 200          | 73 | -127             | 108             |
| 7300          | 300         | -165 | 135             | 100          | 73 | -27              | 108             |
| 7400          | 200         | -165 | 35              | 0            | 73 | 73               | 108             |
| 7500          | 100         | -165 | -65             | 0            | 73 | 73               | 8               |
| 7600          | 0           | -165 | -165            | 0            | 73 | 73               | -92             |
| 7700          | 0           | -165 | -165            | 0            | 73 | 73               | -92             |
| 7800          | 0           | -165 | -165            | 0            | 73 | 73               | -92             |
| 7900          | 0           | -165 | -165            | 0            | 73 | 73               | -92             |
| 8000          | 0           | -165 | -165            | 0            | 73 | 73               | -92             |
| 8100          | 0           | -165 | -165            | 0            | 73 | 73               | -92             |

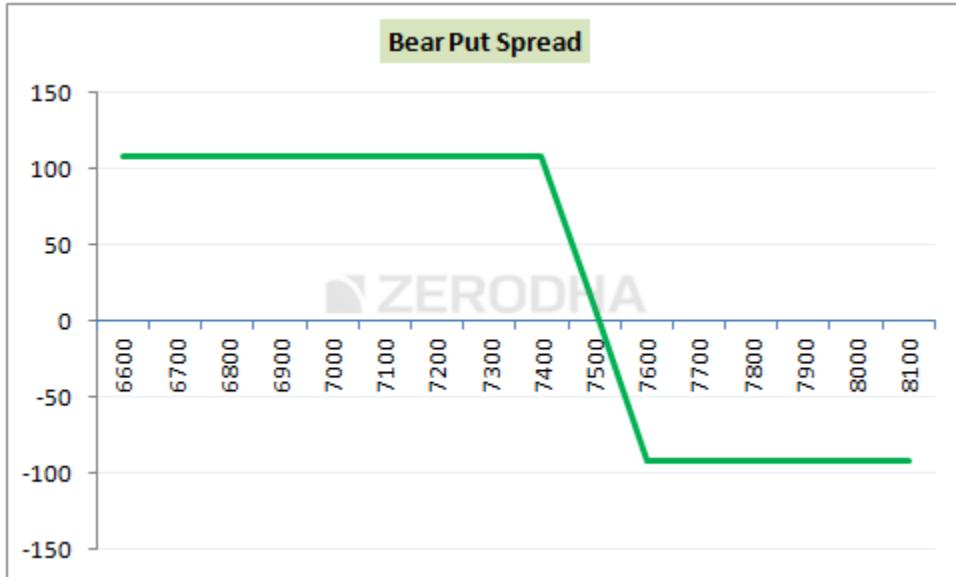
The table below shows the strategy payoff at different expiry levels. The losses are capped to 92 (when markets go up) and the profits are capped to 108 (when markets go down).

### 7.3 – Strategy critical levels

From the above discussed scenarios we can generalize a few things –

1. Strategy makes a loss if the spot moves above the breakeven point, and makes a profit below the breakeven point
2. Both the profits and loss are capped
3. Spread is **difference between the two strike prices.**
  - a. In this example spread would be  $7600 - 7400 = 200$
4. Net Debit = Premium Paid – Premium Received
  - a.  $165 - 73 = 92$
5. Breakeven = Higher strike – Net Debit
  - a.  $7600 - 92 = 7508$
6. Max profit = Spread – Net Debit
  - a.  $200 - 92 = 108$
7. Max Loss = Net Debit
  - a. 92

You can note all these critical points in the strategy payoff diagram -



## 7.4 – Quick note on Delta

This is something I missed talking about in the earlier chapters, but its better late than never :-). Whenever you implement an options strategy always add up the deltas. I used the [B&S calculator](#) to calculate the deltas.

The delta of 7600 PE is -0.618

**Black & Scholes option calculator**

|                      |                      |
|----------------------|----------------------|
| Spot<br>7485         | Strike<br>7600       |
| Expiry<br>2016-02-25 | Volatility (%)<br>18 |
| Interest (%)<br>7.25 | Dividend<br>0        |
| <b>Calculate</b>     |                      |

|         | Call   | Put    |
|---------|--------|--------|
| Premium | 73.52  | 164.41 |
| Delta   | 0.382  | -0.618 |
| Theta   | -3.913 | -2.408 |
| Rho     | 1.220  | -2.101 |
| Gamma   | 0.0014 | 0.0014 |
| Vega    | 5.974  | 5.974  |

The delta of 7400 PE is – 0.342

**Black & Scholes option calculator**

|                      |                      |
|----------------------|----------------------|
| Spot<br>7485         | Strike<br>7400       |
| Expiry<br>2016-02-25 | Volatility (%)<br>18 |
| Interest (%)<br>7.25 | Dividend<br>0        |
| <b>Calculate</b>     |                      |

|         | Call   | Put    |
|---------|--------|--------|
| Premium | 174.23 | 65.75  |
| Delta   | 0.658  | -0.342 |
| Theta   | -4.181 | -2.716 |
| Rho     | 2.082  | -1.152 |
| Gamma   | 0.0013 | 0.0013 |
| Vega    | 5.757  | 5.757  |

The negative sign indicates that the put option premium will go down if the markets go up, and premium gains value if the markets go down. But do note, we have written the 7400 PE, hence the Delta would be

$$-(-0.342)$$

$$+ 0.342$$

Now, since deltas are additive in nature we can add up the deltas to give the combined delta of the position. In this case it would be –

$$-0.618 + (+0.342)$$

$$= -0.276$$

This means the strategy has an overall delta of 0.276 and the ‘-ve’ indicates that the premiums will go up if the markets go down. Similarly you can add up the deltas of other strategies we’ve discussed earlier - Bull Call Spread, Call Ratio Back spread etc and you will realize they all have a positive delta indicating that the strategy is bullish.

When you have more than 2 option legs it gets really difficult to estimate the overall bias of the strategy (whether the strategy is bullish or bearish), in such cases you can quickly add up the deltas to know the bias. Further, if in case the deltas add to zero, then it

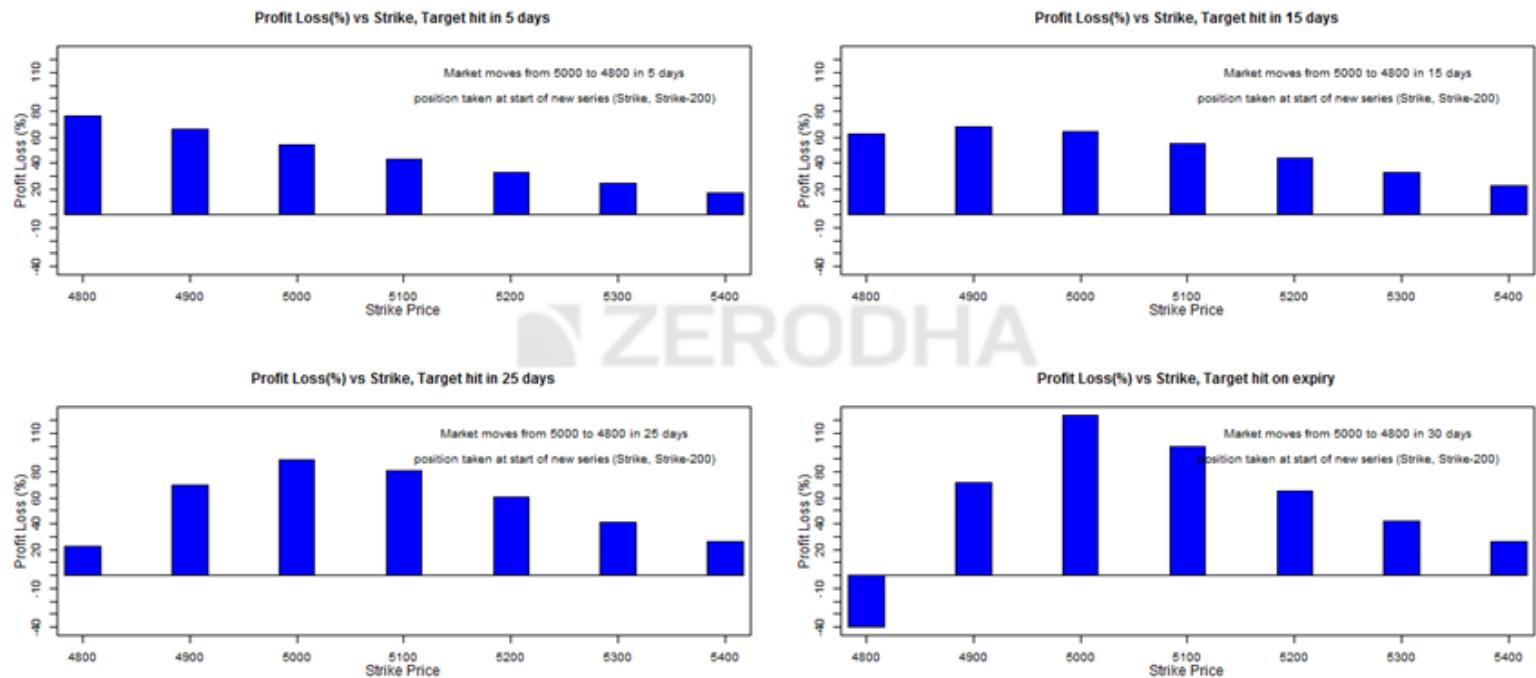
means that the strategy is not really biased to any direction. Such strategies are called ‘Delta Neutral’. We will eventually discuss these strategies at a later point in this module.

Also, you may be interested to know that while the delta neutral strategies are immune to market’s directional move, they react to changes in volatility and time, hence these are also sometime called “Volatility based strategies”.

## 7.5 – Strike selection and effect of volatility

The strike selection for a bear put spread is very similar to the strike selection methodology of a bull call spread. I hope you are familiar with the ‘1<sup>st</sup> half of the series’ and ‘2<sup>nd</sup> half of the series’ methodology. If not I’d suggest you to kindly read through [section 2.3](#).

Have a look at the graph below –



If we are in the first half of the series (ample time to expiry) and we expect the market to go down by about 4% from present levels, choose the following strikes to create the spread

|                                 |               |              |                |
|---------------------------------|---------------|--------------|----------------|
| Expect 4% move to happen within | Higher strike | Lower strike | Refer graph on |
| <b>5 days</b>                   | Far OTM       | Far OTM      | Top left       |
| <b>15 days</b>                  | ATM           | Slightly OTM | Top right      |
| <b>25 days</b>                  | ATM           | OTM          | Bottom left    |
| <b>At expiry</b>                | ATM           | OTM          | Bottom right   |

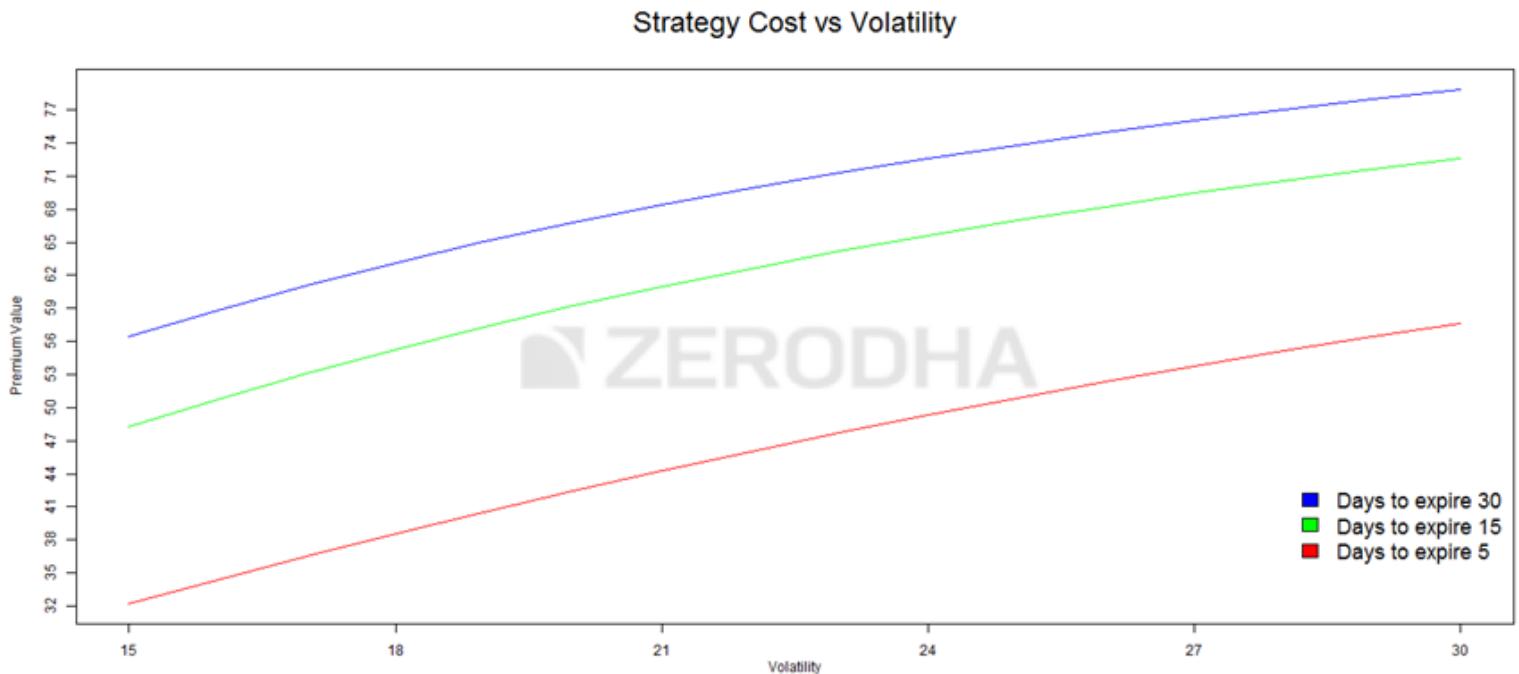
Now assuming we are in the 2<sup>nd</sup> half of the series, selecting the following strikes to create the spread would make sense –



|                                 |               |              |                |
|---------------------------------|---------------|--------------|----------------|
| Expect 4% move to happen within | Higher strike | Lower strike | Refer graph on |
| <b>Same day (even specific)</b> | OTM           | OTM          | Top left       |
| <b>5 days</b>                   | ITM/OTM       | OTM          | Top right      |
| <b>10 days</b>                  | ITM/OTM       | OTM          | Bottom left    |
| <b>At expiry</b>                | ITM/OTM       | OTM          | Bottom right   |

I hope you will find the above two tables useful while selecting the strikes for the bear put spread.

We will now shift our focus on the effect of volatility on the bear put spread. Have a look at the following image –



The graph above explains how the premium varies with respect to variation in volatility and time.

- The blue line suggests that the cost of the strategy **does not vary much** with the increase in volatility when there is **ample time to expiry** (30 days)
- The green line suggests that the cost of the strategy **varies moderately** with the increase in volatility when there is about **15 days to expiry**
- The red line suggests that the cost of the strategy **varies significantly** with the increase in volatility when there is about **5 days to expiry**

From these graphs it is clear that one should not really be worried about the changes in the volatility when there is ample time to expiry. However one should have a view on volatility between midway and expiry of the series. It is advisable to take the bear put spread only when the volatility is expected to increase, alternatively if you expect the volatility to decrease, its best to avoid the strategy.

[\*\*Download\*\*](#) the Bear Put Spread excel.

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## Key takeaways from this chapter

1. Spread offers visibility on risk but at the same time shrinks the reward
2. When you create a spread, the proceeds from the sale of an option offsets the purchase of an option
3. Bear put spread is best invoked when you are moderately bearish on the markets
4. Both the profits and losses are capped
5. Classic bear put spread involves simultaneously purchasing ITM put options and selling OTM put options
6. Bear put spread usually results in a net debit
7. Net Debit = Premium Paid – Premium Received
8. Breakeven = Higher strike – Net Debit
9. Max profit = Spread – Net Debit
10. Max Loss = Net Debit
11. Select strikes based on the time to expiry
12. Implement the strategy only when you expect the volatility to increase (especially in the 2<sup>nd</sup> half of the series)

# Bear Call Spread

## 8.1 – Choosing Calls over Puts

Similar to the Bear Put Spread, the Bear Call Spread is a two leg option strategy invoked when the view on the market is ‘moderately bearish’. The Bear Call Spread is similar to the Bear Put Spread in terms of the payoff structure; however there are a few differences in terms of strategy execution and strike selection. The Bear Call spread involves creating a spread by employing ‘Call options’ rather than ‘Put options’ (as is the case in bear put spread).

You may have a fundamental question at this stage – when the payoffs from both Bear Put spread and Bear Call spread are similar, why should one choose a Bear Call spread over a Bear Put spread?



Well, this really depends on how attractive the premiums are. While the Bear Put spread is executed for a **debit**, the Bear Call spread is executed for a **credit**. So if you are at a point in the market where –

1. The markets have rallied considerably (therefore CALL premiums have swelled)
2. The volatility is favorable
3. Ample time to expiry

And you have a moderately bearish outlook going forward, then it makes sense to invoke a Bear Call Spread for a net credit as opposed to invoking a Bear Put Spread for a net debit. Personally I do prefer strategies which offer net credit rather than strategies which offer net debit.

## 8.2 – Strategy Notes

The Bear Call Spread is a two leg spread strategy traditionally involving ITM and OTM Call options. However you can create the spread using other strikes as well. Do remember, the higher the difference between the two selected strikes (spread), larger is the profit potential.

To implement the bear call spread –

1. Buy 1 OTM Call option (leg 1)
2. Sell 1 ITM Call option (leg 2)

Ensure –

1. All strikes belong to the same underlying
2. Belong to the same expiry series
3. Each leg involves the same number of options

Let us take up example to understand this better -

Date – February 2016

Outlook – Moderately bearish

Nifty Spot – 7222

Bear Call Spread, trade set up -

1. **Buy 7400 CE** by paying Rs.38/- as premium; do note this is an OTM option.  
Since money is going out of my account this is a debit transaction
2. **Sell 7100 CE** and receive Rs.136/- as premium, do note this is an ITM option.  
Since I receive money, this is a credit transaction
3. The net cash flow is the difference between the debit and credit i.e  $136 - 38 = +98$ , since this is a positive cashflow, there is a net credit to my account.

Generally speaking in a bear call spread there is always a ‘net credit’, hence the bear call spread is also called referred to as a ‘credit spread’. After we initiate the trade, the market can move in any direction and expiry at any level. Therefore let us take up a few scenarios to get a sense of what would happen to the bear put spread for different levels of expiry.

### **Scenario 1 – Market expires at 7500 (above the long Call)**

At 7500, both the Call options would have an intrinsic value and hence they both would expire in the money.

- 7400 CE would have an intrinsic value of 100, since we have paid a premium of Rs.38, we would be in a profit of  $100 - 38 = 62$
- 7100 CE would have an intrinsic value of 400, since we have sold this option at Ra.136, we would incur a loss of  $400 - 136 = -264$
- Net loss would be  $-264 + 62 = -202$

### **Scenario 2 – Market expires at 7400 (at the long call)**

At 7400, the 7100 CE would have an intrinsic value and hence would expire in the money. The 7400 CE would expire worthless.

- 7400 CE would expire worthless, hence the entire premium of Rs.38 would be written off as a loss.
- 7100 CE would have an intrinsic value of 300, since we have sold this option at Ra.136, we would incur a loss of  $300 - 136 = -164$
- Net loss would be  $-164 - 38 = -202$

Do note, the loss at 7400 is similar to the loss at 7500 pointing to the fact that above a certain point loss is capped to 202.

### **Scenario 3 – Market expires at 7198 (breakeven)**

At 7198, the trade neither makes money or losses money, hence this is considered a breakeven point. Let us see how the numbers play out here –

- At 7198, the 7100CE would expire with an intrinsic value of 98. Since we have sold the option at Rs.136, we get to retain a portion of the premium i.e  $136 - 98 = +38$
- 7400 CE would expire worthless, hence we will lose the premium paid i.e 38
- Net payoff would  $-38 + 38 = 0$

This clearly indicates that the strategy neither makes money or losses money at 7198.

### **Scenario 4 – Market expires at 7100 (at the short call)**

At 7100, both the Call options would expire worthless, hence it would be out of the money.

- 7400 would not have any value, hence the premium paid would be a complete loss, i.e Rs.38
- 7100 will also not have any intrinsic value, hence the entire premium received i.e Rs.136 would be retained back
- Net profit would be  $136 - 38 = 98$

Clearly, as and when the market falls, the strategy makes a profit.

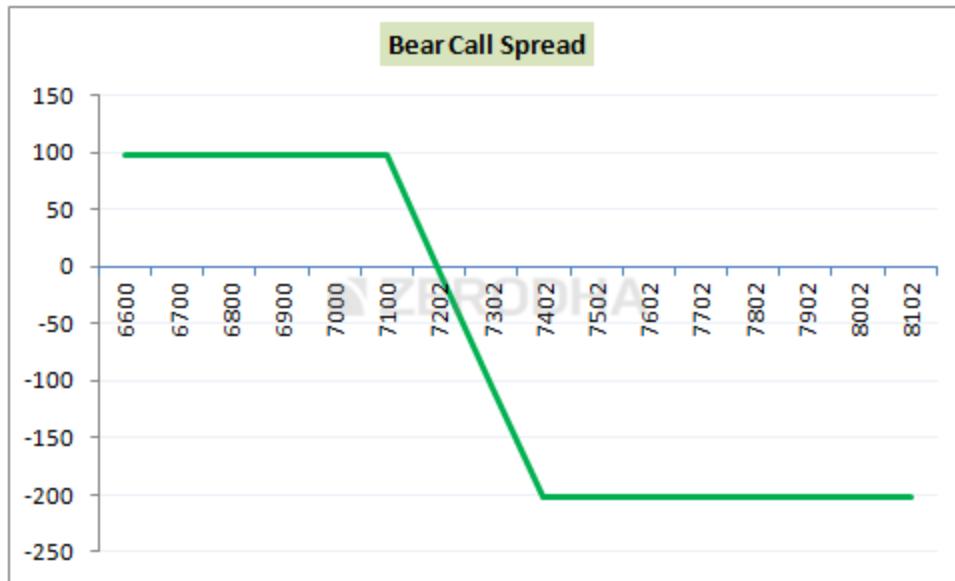
### **Scenario 5 – Market expires at 7000 (below the short call)**

This scenario tests the profitability of the strategy when the market falls further. At 7000, both the call options would expire worthless. While we treat the premium paid for 7400 CE i.e Rs.38 as a loss , we will retain the entire premium received for 7100 CE i.e Rs.136 as a profit. Hence the net profit from the strategy would be  $136-38 = 98$ . Clearly, as and when the market falls, the strategy tends to make money, but it is capped to Rs.98.

Here is the payoff for the strategy at different expiries –

| Market Expiry | Long Call_IV | PP  | Long call payoff | Short call_IV | PR  | Short call payoff | Strategy Payoff |
|---------------|--------------|-----|------------------|---------------|-----|-------------------|-----------------|
| 6600          | 0            | -38 | -38              | 0             | 136 | 136               | 98              |
| 6700          | 0            | -38 | -38              | 0             | 136 | 136               | 98              |
| 6800          | 0            | -38 | -38              | 0             | 136 | 136               | 98              |
| 6900          | 0            | -38 | -38              | 0             | 136 | 136               | 98              |
| 7000          | 0            | -38 | -38              | 0             | 136 | 136               | 98              |
| 7100          | 0            | -38 | -38              | 0             | 136 | 136               | 98              |
| 7202          | 0            | -38 | -38              | 102           | 136 | 34                | -4              |
| 7302          | 0            | -38 | -38              | 202           | 136 | -66               | -104            |
| 7402          | 2            | -38 | -36              | 302           | 136 | -166              | -202            |
| 7502          | 102          | -38 | 64               | 402           | 136 | -266              | -202            |
| 7602          | 202          | -38 | 164              | 502           | 136 | -366              | -202            |
| 7702          | 302          | -38 | 264              | 602           | 136 | -466              | -202            |
| 7802          | 402          | -38 | 364              | 702           | 136 | -566              | -202            |
| 7902          | 502          | -38 | 464              | 802           | 136 | -666              | -202            |
| 8002          | 602          | -38 | 564              | 902           | 136 | -766              | -202            |
| 8102          | 702          | -38 | 664              | 1002          | 136 | -866              | -202            |

These payoffs can be plotted to get the graph of the strategy payoff –



As you can observe, the payoff is similar to a bear put spread where both the profits under best case scenario and losses under worst case scenario is pre defined.

### 8.3 – Strategy Generalization

Going by the above payoff we can generalize the key trigger points for the strategy –

- Spread = Difference between the strikes
  - $7400 - 7100 = 300$
- Net Credit = Premium Received – Premium Paid
  - $136 - 38 = 98$
- Breakeven = Lower strike + Net Credit
  - $7100 + 98 = 7198$
- Max Profit = Net Credit
- Max Loss = Spread – Net Credit
  - $300 - 98 = 202$

At this stage, we can add up the Deltas to get the overall position delta to know the strategy's sensitivity to the directional movement.

From the BS calculator I got the Delta values as follows –

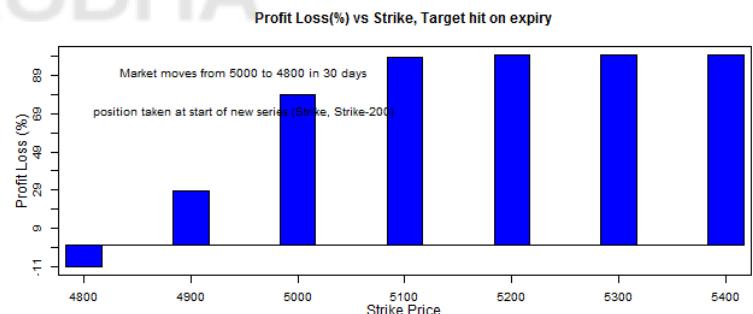
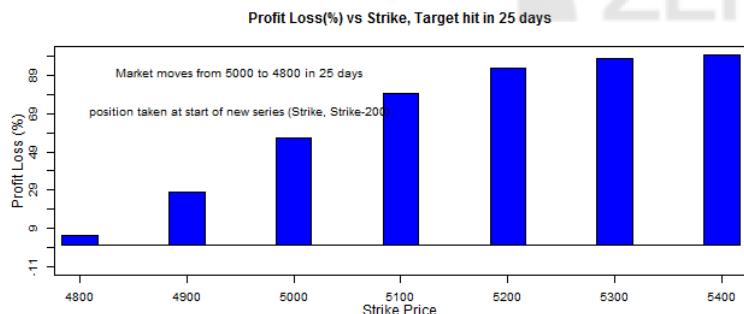
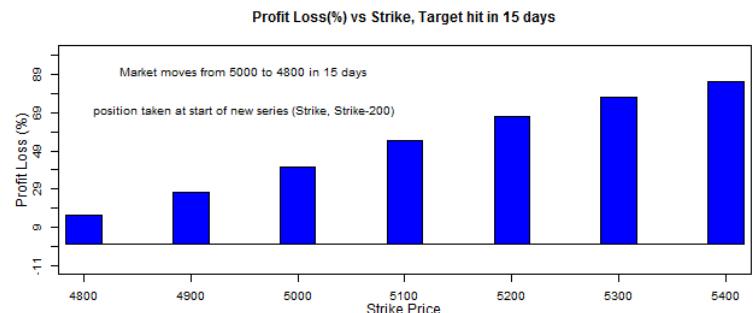
- 7400 CE is OTM option and has a delta of +0.32
- 7100 CE is ITM option and has a delta of +0.89
- Since we are short 7100 CE, the delta is  $-(+0.89) = -0.89$
- Overall position delta is  $= +0.32 + (-0.89) = -0.57$

The delta of the strategy is negative, and it indicates that the strategy makes money when the underlying goes down, and makes a loss when the underlying goes up.

## 8.4 – Strike Selection and impact of Volatility

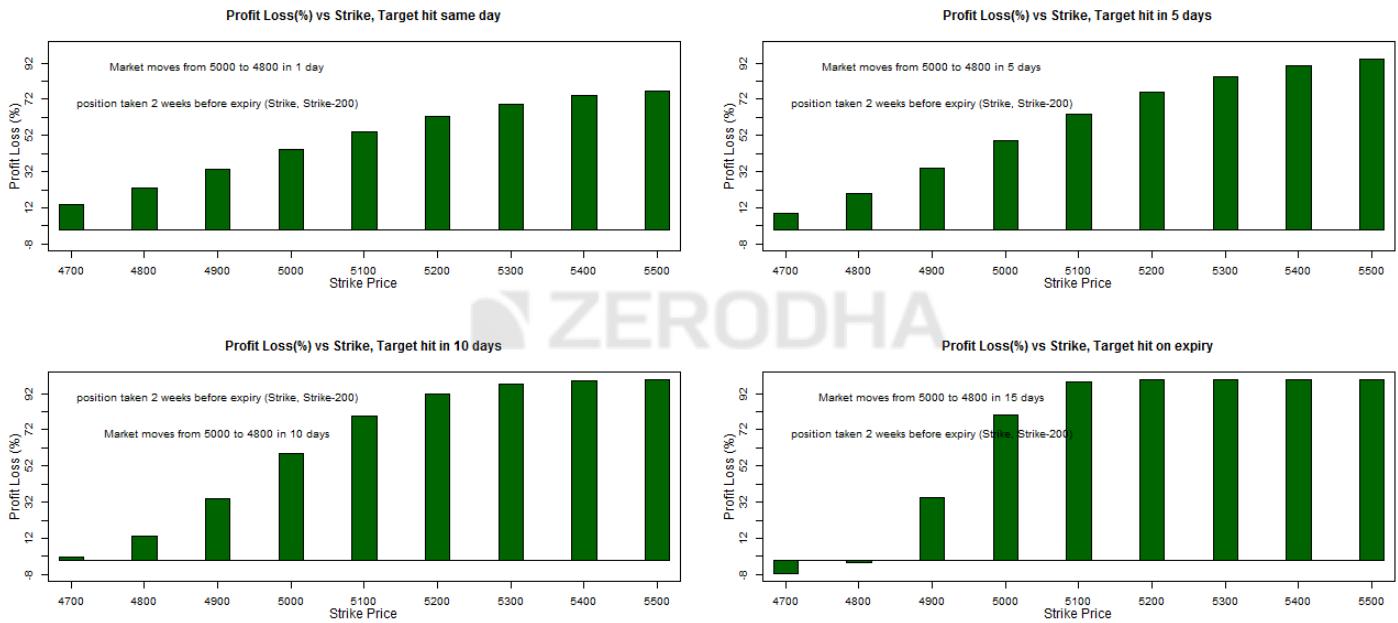
The following images help us identify the best call option strikes to choose, given the time to expiry. We have discussed the split up of time frame (1<sup>st</sup> and 2<sup>nd</sup> half of the series) several times before, hence for this reason I will just post the graphs and the summary table.

Strikes to select when we are in the 1<sup>st</sup> half of the series –



| Expect 4% move to happen within | Higher strike | Lower strike    | Refer graph on |
|---------------------------------|---------------|-----------------|----------------|
| <b>5 days</b>                   | Far OTM       | ATM+2 strikes   | Top left       |
| <b>15 days</b>                  | Far OTM       | ATM + 2 strikes | Top right      |
| <b>25 days</b>                  | OTM           | ATM + 1 strike  | Bottom left    |
| <b>At expiry</b>                | OTM           | ATM             | Bottom right   |

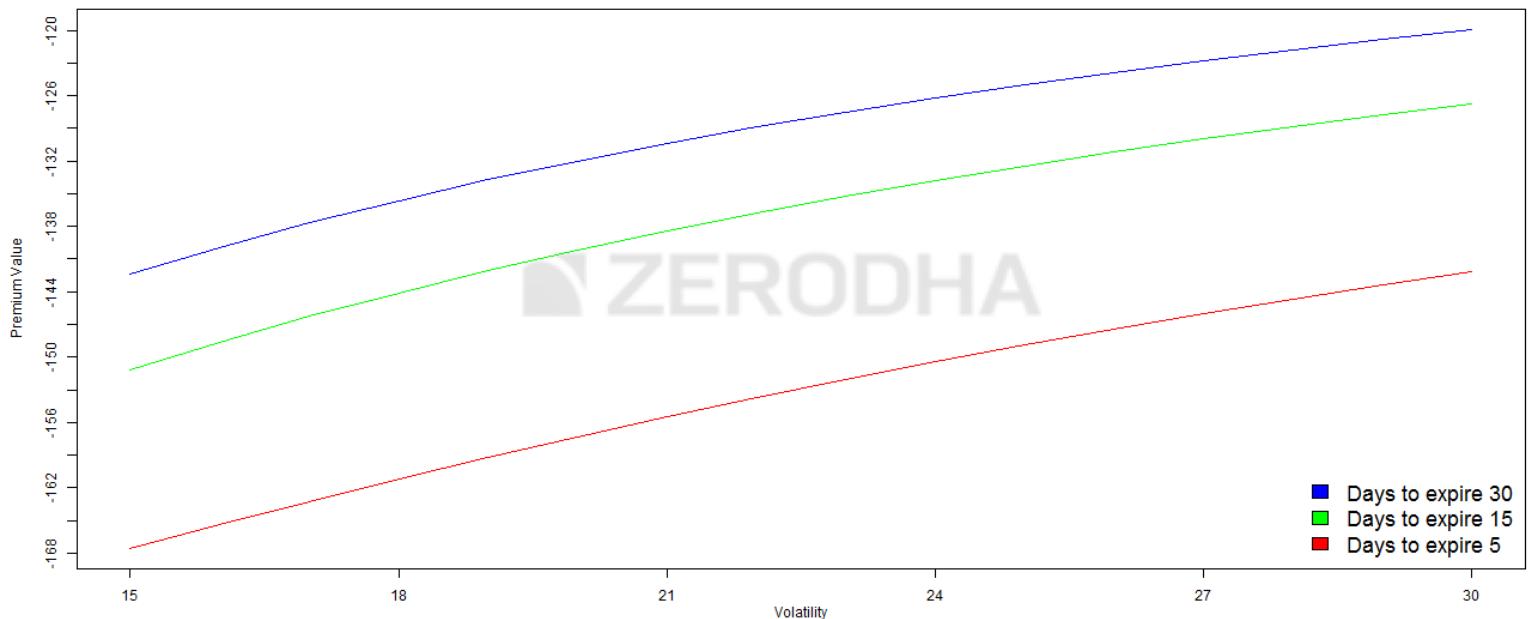
Strikes to select when we are in the 2<sup>nd</sup> half of the series –



| Expect 4% move to happen within | Higher strike | Lower strike | Refer graph on |
|---------------------------------|---------------|--------------|----------------|
| <b>5 days</b>                   | Far OTM       | Far OTM      | Top left       |
| <b>15 days</b>                  | Far OTM       | Slightly OTM | Top right      |
| <b>25 days</b>                  | Slightly OTM  | ATM          | Bottom left    |
| <b>At expiry</b>                | OTM           | ATM/ITM      | Bottom right   |

The following graph talks about the variation in strategy cost with respect to changes in the volatility –

### Strategy Cost vs Volatility



The graph above explains how the premium varies with respect to variation in volatility and time.

- The blue line suggests that the cost of the strategy **does not vary much** with the increase in volatility when there is **ample time to expiry** (30 days)
- The green line suggests that the cost of the strategy **varies moderately** with the increase in volatility when there is about **15 days to expiry**
- The red line suggests that the cost of the strategy **varies significantly** with the increase in volatility when there is about **5 days to expiry**

From these graphs it is clear that one should not really be worried about the changes in the volatility when there is ample time to expiry. However one should have a view on volatility between midway and expiry of the series. It is advisable to take the bear call spread only when the volatility is expected to increase, alternatively if you expect the volatility to decrease, its best to avoid the strategy.

[\*\*Download\*\*](#) the Bear Call Spread excel.

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## **Key takeaways from this chapter**

1. Bear call spread is best invoked when you are moderately bearish on the markets
2. You choose a bear call spread over a bear put spread when the call option premiums are more attractive than put options.
3. Both the profits and losses are capped
4. Classic bear call spread involves simultaneously purchasing OTM call options and selling ITM call options
5. Bear call spread usually results in a net credit, in fact this is another key reason to invoke a bear call spread versus a bear put spread
6. Net Credit = Premium Received – Premium Paid
7. Breakeven = Lower strike + Net Credit
8. Max profit = Net Credit
9. Max Loss = Spread – Net Credit
10. Select strikes based on the time to expiry
11. Implement the strategy only when you expect the volatility to increase (especially in the 2<sup>nd</sup> half of the series)

## CHAPTER 9

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# Put Ratio Back Spread

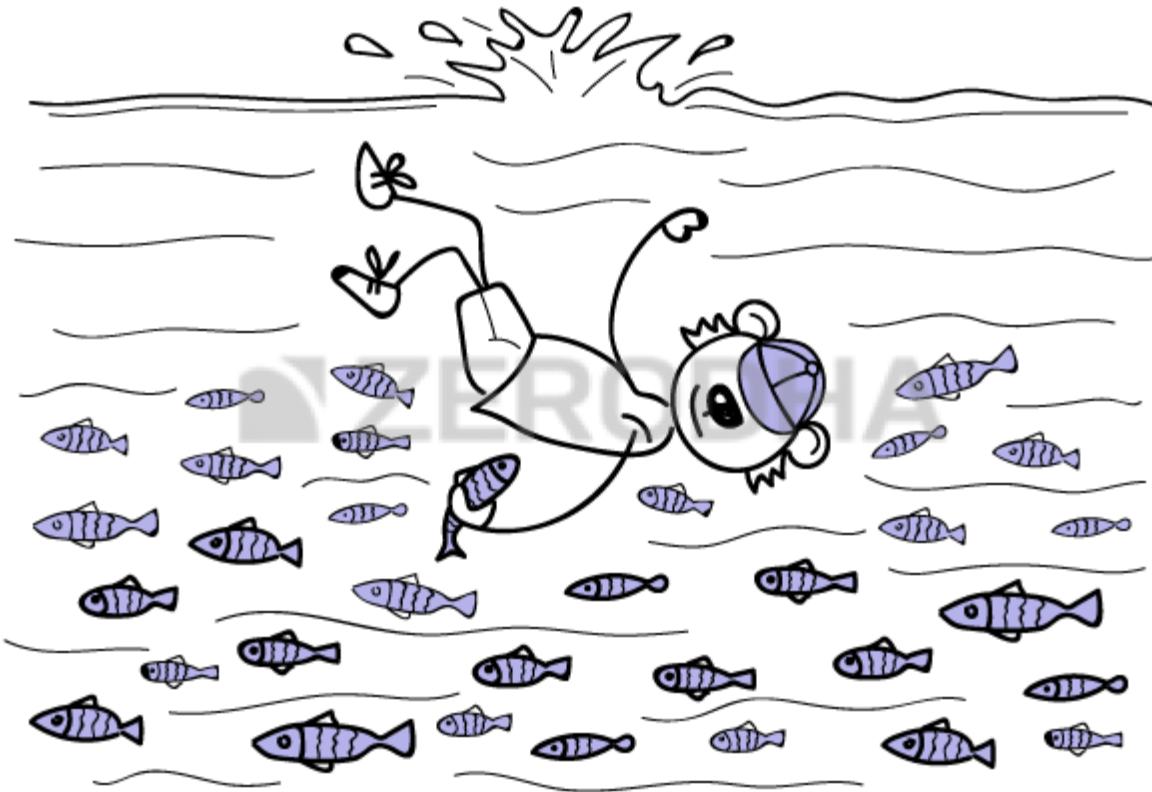
## 9.1 – Background

We discussed the “Call Ratio Back spread” strategy extensively in chapter 4 of this module. The Put ratio back spread is similar except that the trader invokes this when he is bearish on the market or stock.

At a broad level this is what you will experience when you implement the Put Ratio Back Spread

1. Unlimited profit if the market goes down
2. Limited profit if market goes up
3. A predefined loss if the market stays within a range

In simpler words you make money as long as the market moves in either direction, of course the strategy is more favorable if market goes down.



Usually, the Put Ratio Back Spread is deployed for a ‘net credit’, meaning money flows into your account as soon as you execute Put Ratio Back Spread. The ‘net credit’ is what you make if the market goes up, as opposed to your expectation (i.e market going down). On the other hand if the market indeed goes down, then you stand to make an unlimited profit.

I suppose this should also explain why the put ratio back spread is better than buying a plain vanilla put option.

## 9.2 – Strategy Notes

The Put Ratio Back Spread is a 3 leg option strategy as it involves **buying two OTM Put options and selling one ITM Put option**. This is the classic 2:1 combo. In fact the put ratio back spread has to be executed in the 2:1 ratio meaning 2 options bought for every one option sold, or 3 options bought for every 2 options sold, so on and so forth.

Let take an example - Nifty Spot is at 7506 and you expect Nifty to hit 7000 by the end of expiry. This is clearly a bearish expectation. To implement the Put Ratio Back Spread

- 
- 1. Sell **one** lot of 7500 PE (ITM)
- 2. Buy **two** lots of 7200 PE (OTM)

Make sure –

- 1. The Put options belong to the same expiry
- 2. Belong to the same underlying
- 3. The ratio is maintained

The trade set up looks like this –

- 1. 7500 PE, one lot short, the premium received for this is Rs.134/-
- 2. 7200 PE, two lots long, the premium paid is Rs.46/- per lot, so Rs.92/- for 2 lots
- 3. Net Cash flow is = Premium Received – Premium Paid i.e  $134 - 92 = 42$  (Net Credit)

With these trades, the Put ratio back spread is executed. Let us check what would happen to the overall cash flow of the strategies at different levels of expiry.

Do note we need to evaluate the strategy payoff at various levels of expiry, as the strategy payoff is quite versatile.

### **Scenario 1 – Market expires at 7600 (above the ITM option)**

At 7600, both the Put options would expire worthless. The intrinsic value of options and the eventual strategy payoff is as below –

- 7200 PE, would expire worthless, since we are long 2 lots of this option at Rs.46 per lot, we would **lose** the entire premium of Rs.92 paid
- 7500 PE would also expire worthless, but we have written this option and received a premium of Rs.134, which in this case can be retained back
- The net payoff from the strategy is  $134 - 92 = 42$

Do note, the net payoff of the strategy at 7600 (higher than the ITM strike) is equivalent to the net credit.

### **Scenario 2 – Market expires at 7500 (at the higher strike i.e the ITM option)**

At 7500 both the options would have no intrinsic value, hence they both would expire worthless. Hence the payoff would be similar to the payoff we discussed at 7600. Hence the net strategy payoff would be equal to Rs.42 (net credit).

In fact as you may have guessed, the payoff of the strategy at any point above 7500 is equal to the net credit.

### **Scenario 3 – Market expires at 7458 (higher break even)**

Like in the call ratio back spread strategy, the put ratio back spread too has two breakeven points i.e the upper breakeven and the lower breakeven point. 7458 marks the upper breakeven level; of course we will discuss how we arrived at the upper breakeven point a little later in the chapter.

- At 7458, the 7500 PE will have an intrinsic value. As you may recall, the put option intrinsic value can be calculated as  $\text{Max}[\text{Strike} - \text{Spot}, 0]$  i.e  $\text{Max}[7500 - 7458, 0]$  hence 42
- Since we have sold 7500 PE at 134, we will lose a portion of the premium received and retain the rest. Hence the payoff would be  $134 - 42 = 92$
- The 7200 PE will not have any intrinsic value, hence the entire premium paid i.e 92 is lost
- So on one hand we made 92 on the 7500 PE and on the other we would lose 92 on the 7200 PE resulting in no loss, no gain. Thus, 7458 marks as one of the breakeven points.

### **Scenario 4 – Market expires at 7200 (Point of maximum pain)**

This is the point at which the strategy causes maximum pain, let us figure out why.

- At 7200, 7500 PE would have an intrinsic value of 300 ( $7500 - 7200$ ). Since we have sold this option and received a premium of Rs.134, we would lose the entire premium received and more. The payoff on this would be  $134 - 300 = -166$

- 7200 PE would expire worthless as it has no intrinsic value. Hence the entire premium paid of Rs.92 would be lost
- The net strategy payoff would be  $-166 - 92 = -258$
- This is a point where both the options would turn against us, hence is considered as the point of maximum pain

### **Scenario 5 – Market expires at 6942 (lower break even)**

At 6942, both the options would have an intrinsic value; however this is the lower breakeven point. Let's figure out how this works –

- At 6942, 7500 PE will have an intrinsic value equivalent of  $7500 - 6942 = 558$ . Since we have sold this option at 134, the payoff would be  $134 - 558 = -424$
- The 7200 PE will also have an intrinsic value equivalent of  $7200 - 6942 = 258$  per lot, since we are long two lots the intrinsic value adds up to 516. We have initially paid a premium of Rs.92 (both lots included), hence this needs to be deducted to arrive at the payoff would be  $516 - 92 = +424$
- So on one hand we make 424 on the 7200 PE and on the other we would lose 424 on the 7500 PE resulting in no loss, no gain. Thus, 6942 marks as one of the breakeven points.

### **Scenario 6 – Market expires at 6800 (below the lower strike price)**

Remember, the put ratio backspread is a bearish strategy. It is supposed to make money once the market goes below the lower breakeven point. So let's understand how the payoff behaves at a point lower than the lower breakeven point.

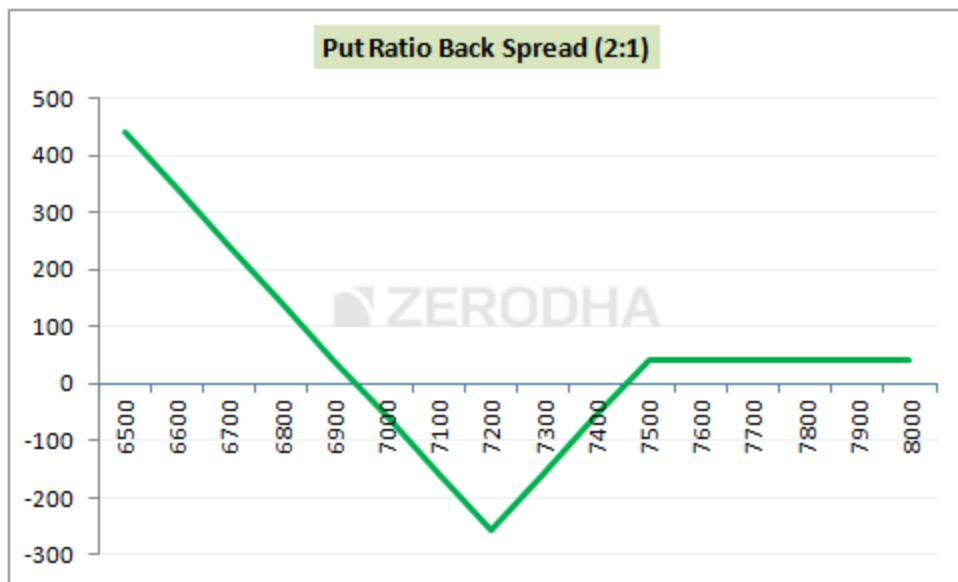
- At 6800, 7500 PE will have an intrinsic value of 700 and since we are short 7500PE at 134, we would lose  $134 - 700 = -566$
- 7200 PE will have an intrinsic value of 400. Since we are long 2 lots, the intrinsic value would be 800. Premium paid for two lots is Rs.92, hence after adjusting for the premium paid, we get to make  $800 - 92 = +708$
- Net strategy payoff would be  $708 - 566 = +142$

Likewise, you can evaluate the strategy payoff at different levels of market expiry and you will realize that the profits are uncapped as long as the market continues to slide. The following table showcases the same –

#### Calculations

| Market Expiry | ITM_IV | PR  | ITM Payoff | OTM_IV | PP | OTM_Payoff | Strategy Payoff |
|---------------|--------|-----|------------|--------|----|------------|-----------------|
| 6500          | 1000   | 134 | -866       | 1400   | 92 | 1308       | 442             |
| 6600          | 900    | 134 | -766       | 1200   | 92 | 1108       | 342             |
| 6700          | 800    | 134 | -666       | 1000   | 92 | 908        | 242             |
| 6800          | 700    | 134 | -566       | 800    | 92 | 708        | 142             |
| 6900          | 600    | 134 | -466       | 600    | 92 | 508        | 42              |
| 7000          | 500    | 134 | -366       | 400    | 92 | 308        | -58             |
| 7100          | 400    | 134 | -266       | 200    | 92 | 108        | -158            |
| 7200          | 300    | 134 | -166       | 0      | 92 | -92        | -258            |
| 7300          | 200    | 134 | -66        | 0      | 92 | -92        | -158            |
| 7400          | 100    | 134 | 34         | 0      | 92 | -92        | -58             |
| 7500          | 0      | 134 | 134        | 0      | 92 | -92        | 42              |
| 7600          | 0      | 134 | 134        | 0      | 92 | -92        | 42              |
| 7700          | 0      | 134 | 134        | 0      | 92 | -92        | 42              |
| 7800          | 0      | 134 | 134        | 0      | 92 | -92        | 42              |
| 7900          | 0      | 134 | 134        | 0      | 92 | -92        | 42              |
| 8000          | 0      | 134 | 134        | 0      | 92 | -92        | 42              |

Plotting the different payoff points, gives us the strategy payoff graph –



Clearly from the graph above, we can conclude –

1. If markets go down, then the profits are unlimited

2. There are two breakeven points
3. The point at which maximum loss occurs is at 7200
4. If markets goes up, then the profits are limited

## 9.3 – Strategy generalization

We can generalize the key strategy levels as below –

1. Spread = Higher Strike – lower strike
  - a.  $7500 - 7200 = 300$
2. Max loss = Spread – Net credit
  - a.  $300 - 42 = 258$
3. Max Loss occurs at = Lower strike price
4. Lower Breakeven point = Lower strike – Max loss
  - a.  $7200 - 258 = 6942$
5. Upper breakeven point = Lower strike + Max loss
  - a.  $7200 + 258 = 7458$

## 9.4 – Delta, strike selection, and effect of volatility

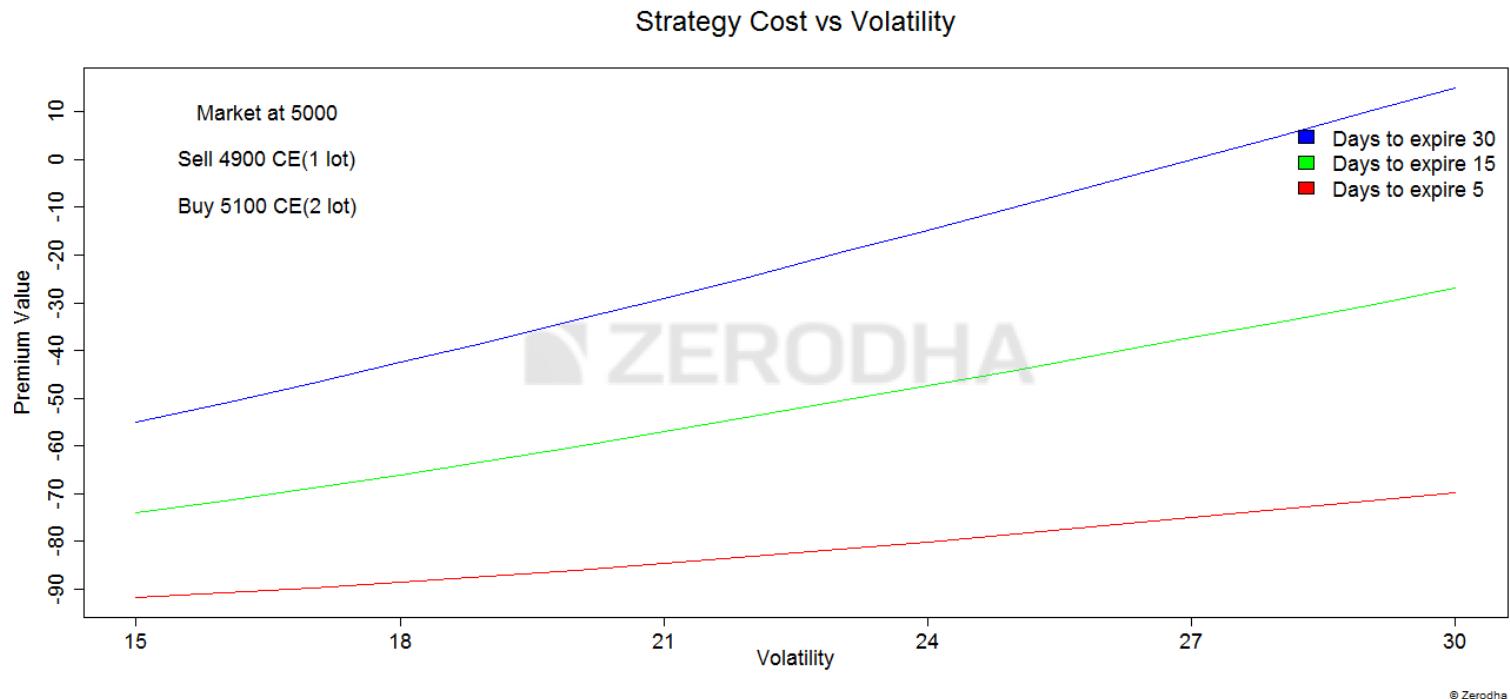
As we know, the strategy gets more profitable as and when the market falls. In other words this is a directional strategy (profitable when markets go down) and therefore the delta at overall strategy level should reflect this. Let us do the math to figure this out –

- 7500 PE is ITM option, delta is - 0.55. However since we have written the option, the delta is  $-(-0.55) = +0.55$
- 7200 PE is OTM, has a delta of - 0.29, remember we are long two lots here
- The overall position delta would be  $+0.55 + (-0.29) + (-0.29) = -0.03$

The non zero Delta value clearly indicates that the strategy is sensitive to the directional movement (although negligible). The negative sign indicates that the strategy makes money when the market goes down.

As far as the strikes are concerned, I'd suggest you stick to the classic combination of ITM and OTM options. Remember the trade needs to be executed for a 'Net Credit'. Do not initiate this strategy if there is a net outflow of cash at the time of execution.

Let's look at the variation in volatility and its effect on the strategy –



There are three colored lines depicting the change of “premium value” versus change in volatility. These lines help us understand the effect of increase in volatility on the strategy keeping time to expiry in perspective.

- Blue Line** – This line suggests that an increase in volatility when there is ample time to expiry (30 days) is beneficial for the Put ratio back spread. As we can see the strategy payoff increases from -57 to +10 when the volatility increase from 15% to 30%. Clearly this means that when there is ample time to expiry, besides being right on the direction of stock/index you also need to have a view on volatility. For this reason, even though I'm bearish on the stock, I would be a bit hesitant to deploy this strategy at the start of the series if the volatility is on the higher side (say more than double of the usual volatility reading)
- Green line** - This line suggests that an increase in volatility when there are about 15 days time to expiry is beneficial, although not as much as in the previous case. As we can see the strategy payoff increases from -77 to -47 when the volatility increase from 15% to 30%.

3. **Red line** – Clearly increase in volatility when we have a few days to expiry does not have much impact on the premium value. This means, when you are close to expiry you only need to worry about the directional movement and need not really worry much about the variation in volatility.

[\*\*Download\*\*](#) the Put Ratio Back spread excel.

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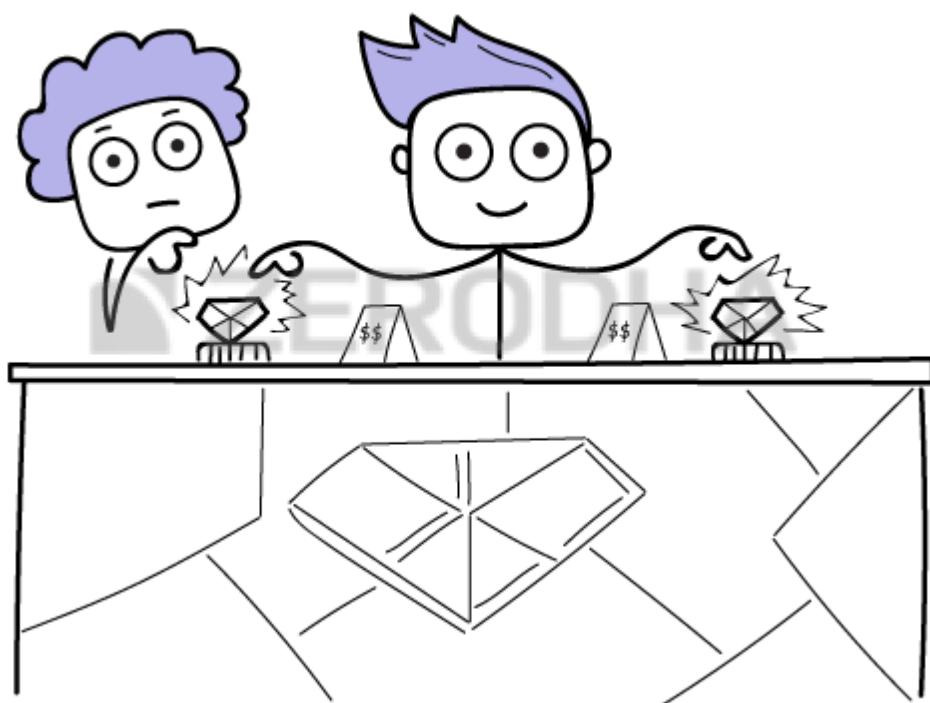
## Key takeaways from this chapter

1. The Put Ratio Back spread is best executed when your outlook on the stock/index is bearish
2. The strategy requires you to sell 1 ITM PE and buy 2 OTM PE, and this is to be executed in the same ratio i.e for every 1 option sold, 2 options have to be purchased
3. The strategy is usually executed for a ‘Net Credit’
4. The strategy makes limited money if the stock price goes up, and unlimited profit when the stock price goes down
5. There are two break even points – lower breakeven and upper breakeven
6. Spread = Higher Strike – Lower Strike
7. Net Credit = Premium Received for Higher strike – 2\*Premium paid for lower strike
8. Max Loss = Spread – Net Credit
9. Max Loss occurs at = Lower Strike
10. The payoff when market goes up = Net Credit
11. Lower Breakeven = Lower Strike – Max Loss
12. Upper Breakeven = Lower Strike + Max Loss
13. Irrespective of the time to expiry opt for ITM and OTM strike combination
14. Increase in volatility is good for this strategy when there is more time to expiry

# The Long Straddle

## 10.1 – The directional dilemma

How many times have you been in a situation wherein you take a trade after much conviction, either long or short and right after you initiate the trade the market moves just the other way round? All your strategy, planning, efforts, and capital go for a toss. I'm certain this is one situation all of us have been in. In fact this is one of the reasons why most professional traders go beyond the regular directional bets and set up strategies which are insulated against the unpredictable market direction. Strategies whose profitability does not really depend on the market direction are called "Market Neutral" or "Delta Neutral" strategies. Over the next few chapters we will understand some of the market neutral strategies and how a regular retail trader can execute such strategies. Let us begin with a 'Long Straddle'.



## 10.2 – Long Straddle

Long straddle is perhaps the simplest market neutral strategy to implement. Once implemented, the P&L is not affected by the direction in which the market moves. The market can move in any direction, but it has to move. As long as the market moves (irrespective of its direction), a positive P&L is generated. To implement a long straddle all one has to do is –

1. Buy a Call option
2. Buy a Put option

Ensure –

1. Both the options belong to the same underlying
2. Both the options belong to the same expiry
3. Belong to the same strike

Here is an example which explains the execution of a long straddle and the eventual strategy payoff. As I write this, the market is trading at 7579, which would make the strike 7600 ‘At the money’. Long straddle would require us to simultaneously purchase

| CALLS     |         |            |        |        |       |          |         |           |           |         |              | PUTS    |           |           |         |          |       |        |          |            |           |       |  |
|-----------|---------|------------|--------|--------|-------|----------|---------|-----------|-----------|---------|--------------|---------|-----------|-----------|---------|----------|-------|--------|----------|------------|-----------|-------|--|
| Chart     | OI      | Chng in OI | Volume | IV     | LTP   | Net Chng | Bid Qty | Bid Price | Ask Price | Ask Qty | Strike Price | Bid Qty | Bid Price | Ask Price | Ask Qty | Net Chng | LTP   | IV     | Volume   | Chng in OI | OI        | Chart |  |
| 225       | -       | -          | -      | -      | -     | -6,225   | 817.20  | 843.10    | 2,625     | 6750.00 | 600          | 2.55    | 3.50      | 600       | -1.00   | 3.00     | 29.43 | 11     | -        | 57,975     | 57,975    |       |  |
| 428,325   | -1,800  | 51         | -      | 784.40 | 53.05 | 75       | 781.40  | 786.75    | 150       | 6800.00 | 22,125       | 3.10    | 3.15      | 75        | -1.20   | 3.10     | 28.07 | 5,037  | 1,725    | 3,249,375  | 3,249,375 |       |  |
| 1,575     | -       | -          | -      | -      | -     | -6,150   | 718.45  | 743.80    | 2,250     | 6850.00 | 1,875        | 3.25    | 3.40      | 525       | -1.00   | 3.35     | 26.74 | 117    | 4,275    | 51,075     | 51,075    |       |  |
| 449,775   | -375    | 51         | -      | 694.50 | 76.05 | 75       | 683.25  | 688.00    | 75        | 6900.00 | 6,525        | 3.60    | 3.65      | 8,925     | -1.55   | 3.65     | 25.50 | 5,375  | 50,925   | 2,500,650  | 2,500,650 |       |  |
| 5,250     | -       | -          | -      | -      | -     | -5,550   | 619.90  | 643.65    | 1,350     | 6950.00 | 75           | 3.65    | 4.00      | 75        | -2.00   | 3.90     | 24.15 | 91     | 2,850    | 84,000     | 84,000    |       |  |
| 1,188,375 | -2,850  | 181        | -      | 586.85 | 59.30 | 375      | 584.35  | 589.25    | 225       | 7000.00 | 1,650        | 4.35    | 4.40      | 7,275     | -2.55   | 4.35     | 23.00 | 9,019  | 225      | 6,112,575  | 6,112,575 |       |  |
| 29,475    | -       | -          | -      | -      | -     | -5,775   | 519.15  | 541.40    | 300       | 7050.00 | 75           | 4.65    | 5.35      | 75        | -3.50   | 5.00     | 21.85 | 117    | 975      | 90,000     | 90,000    |       |  |
| 1,090,500 | 675     | 87         | -      | 490.80 | 60.15 | 150      | 488.75  | 492.20    | 375       | 7100.00 | 6,450        | 5.85    | 5.90      | 9,525     | -4.10   | 5.85     | 20.81 | 8,025  | -50,250  | 3,841,950  | 3,841,950 |       |  |
| 53,025    | -       | 3          | -      | 445.10 | 68.10 | 150      | 430.95  | 441.00    | 75        | 7150.00 | 1,275        | 7.50    | 7.75      | 10,350    | -4.70   | 7.70     | 20.17 | 989    | -5,025   | 167,025    | 167,025   |       |  |
| 3,324,275 | -9,450  | 372        | -      | 392.05 | 52.50 | 150      | 393.00  | 394.95    | 75        | 7200.00 | 2,250        | 9.20    | 9.30      | 750       | -6.80   | 9.30     | 19.18 | 13,896 | -17,625  | 6,343,875  | 6,343,875 |       |  |
| 77,775    | -3,300  | 69         | -      | 344.00 | 50.70 | 150      | 340.00  | 346.75    | 75        | 7250.00 | 2,100        | 11.90   | 12.15     | 75        | -8.55   | 12.15    | 18.53 | 1,051  | -15,675  | 209,475    | 209,475   |       |  |
| 1,785,375 | -7,650  | 526        | 9.83   | 296.50 | 46.80 | 75       | 298.25  | 299.40    | 75        | 7300.00 | 1,875        | 15.75   | 15.85     | 1,050     | -11.40  | 15.75    | 17.88 | 27,791 | -328,425 | 4,707,675  | 4,707,675 |       |  |
| 113,925   | -675    | 36         | 12.42  | 251.90 | 40.15 | 300      | 253.55  | 256.75    | 75        | 7350.00 | 150          | 20.70   | 20.90     | 1,125     | -15.20  | 20.90    | 17.21 | 1,506  | 11,625   | 297,075    | 297,075   |       |  |
| 4,103,100 | -56,175 | 4,029      | 12.02  | 212.20 | 43.10 | 300      | 212.40  | 212.75    | 75        | 7400.00 | 7,200        | 27.90   | 28.10     | 1,950     | -18.00  | 28.10    | 16.65 | 29,385 | 65,325   | 5,999,700  | 5,999,700 |       |  |
| 321,375   | -15,225 | 1,175      | 12.69  | 171.05 | 37.05 | 300      | 172.25  | 172.95    | 75        | 7450.00 | 225          | 36.70   | 36.80     | 600       | -22.20  | 36.80    | 16.02 | 1,992  | 2,025    | 476,025    | 476,025   |       |  |
| 7,100,025 | 53,400  | 21,639     | 12.84  | 136.20 | 32.15 | 450      | 136.15  | 136.50    | 300       | 7500.00 | 1,950        | 49.60   | 49.85     | 150       | -28.05  | 49.90    | 15.59 | 35,368 | 337,000  | 4,658,825  | 4,658,825 |       |  |
| 605,625   | -2,625  | 2,292      | 12.77  | 103.40 | 25.70 | 1,875    | 103.40  | 104.00    | 300       | 7550.00 | 150          | 65.55   | 65.90     | 675       | -32.30  | 66.00    | 15.14 | 3,233  | 135,750  | 615,525    | 615,525   |       |  |
| 6,058,275 | 56,700  | 41,078     | 12.91  | 76.90  | 20.95 | 600      | 76.80   | 76.95     | 375       | 7600.00 | 75           | 88.05   | 88.35     | 525       | -38.90  | 88.25    | 15.08 | 21,004 | 350,325  | 1,593,300  | 1,593,300 |       |  |
| 354,300   | 30,000  | 2,115      | 12.82  | 54.10  | 15.45 | 450      | 54.05   | 54.50     | 225       | 7650.00 | 75           | 114.00  | 116.25    | 75        | -47.15  | 114.40   | 14.74 | 58     | 1,275    | 24,825     | 24,825    |       |  |
| 6,831,225 | -14,550 | 36,560     | 12.83  | 36.80  | 11.10 | 750      | 36.75   | 36.90     | 675       | 7700.00 | 150          | 146.25  | 146.80    | 75        | -49.50  | 147.10   | 15.12 | 3,482  | 33,225   | 788,025    | 788,025   |       |  |
| 273,600   | -8,475  | 1,124      | 12.71  | 23.35  | 6.95  | 450      | 23.50   | 23.60     | 75        | 7750.00 | 150          | 180.40  | 186.70    | 75        | -59.70  | 180.15   | 14.21 | 1      | -        | 17,175     | 17,175    |       |  |
| 4,538,100 | 42,150  | 23,604     | 12.70  | 14.80  | 4.30  | 1,275    | 14.75   | 14.85     | 1,725     | 7800.00 | 75           | 222.80  | 224.00    | 150       | -57.05  | 225.00   | 15.24 | 496    | 11,175   | 496,950    | 496,950   |       |  |
| 113,775   | 15,375  | 689        | 12.63  | 8.60   | 1.70  | 975      | 8.40    | 8.95      | 75        | 7850.00 | 450          | 262.90  | 278.50    | 600       | -       | -        | -     | -      | -        | 375        | 375       |       |  |
| 1,449,075 | 233,025 | 14,064     | 13.13  | 5.80   | 1.20  | 1,275    | 5.80    | 5.85      | 1,875     | 7900.00 | 75           | 314.80  | 316.20    | 75        | -61.35  | 317.00   | 17.89 | 113    | 225      | 163,425    | 163,425   |       |  |
| 79,050    | -       | 49         | 13.88  | 4.25   | 1.05  | 975      | 2.55    | 3.95      | 75        | 7950.00 | 5,925        | 339.75  | 383.65    | 5,925     | -       | -        | -     | -      | -        | -          | 375       |       |  |
| 3,880,100 | 87,375  | 10,261     | 14.12  | 2.70   | 0.25  | 150      | 2.65    | 2.70      | 7,575     | 8000.00 | 300          | 413.00  | 414.10    | 75        | -60.50  | 416.00   | 20.74 | 96     | -3,600   | 635,675    | 635,675   |       |  |
| 525       | -       | -          | -      | -      | -     | -975     | 1.00    | 2.40      | 75        | 8050.00 | 6,000        | 435.35  | 481.85    | 4,875     | -       | -        | -     | -      | -        | -          | 375       |       |  |

the ATM call and put options. As you can see from the snapshot above, 7600CE is trading at 77 and 7600 PE is trading at 88. The simultaneous purchase of both these options would result in a net debit of Rs.165. The idea here is – the trader is long on both the call and put options belonging to the ATM strike. Hence the trader is not really worried about which direction the market would move. If the market goes up, the trader would expect to see gains in Call options far higher than the loss made (read premium paid) on the put option. Similarly, if the market goes down, the gains in the Put option far exceeds the loss on the call option. Hence irrespective of the direction, the gain in one option is good enough to offset the loss in the other and still yield a positive P&L. Hence the market direction here is meaningless. Let us break this down further and evaluate different expiry scenarios. **Scenario 1 – Market expires at 7200, put option makes money** This is a scenario where the gain in the put option not only offsets the loss made in the call option but also yields a positive P&L over and above. At 7200 –

- 7600 CE will expire worthless, hence we lose the premium paid i.e **Rs. 77**
- 7600 PE will have an intrinsic value of 400. After adjusting for the premium paid i.e Rs.88, we get to retain  $400 - 88 = 312$
- The net payoff would be  $312 - 77 = + 235$

As you can see, the gain in put option after adjusting for the premium paid for put option and after adjusting for the premium paid for the call option still yields a positive P&L. **Scenario 2 – Market expires at 7435 (lower breakeven)** This is a situation where the strategy neither makes money nor loses any money.

- 7600 CE would expire worthless; hence the premium paid has to be written off. Loss would be Rs.77
- 7600 PE would have an intrinsic value of 165, hence this is the gain in the put option
- However the net premium paid for the call and put option is Rs.165, which gets adjusted with the gain in the put option

If you think about it, with respect to the ATM strike, market has indeed expired at a lesser value. So therefore the put option makes money. However, the gains made in the put option adjusts itself against the premium paid for both the call and put option, eventually leaving no money on the table. **Scenario 3 – Market expires at 7600 (at**

**the ATM strike)** At 7600, the situation is quite straight forward as both the call and put option would expire worthless and hence the premium paid would be gone. The loss here would be equivalent to the net premium paid i.e Rs.165.

**Scenario 4 – Market expires at 7765 (upper breakeven)** This is similar to the 2<sup>nd</sup> scenario we discussed. This is a point at which the strategy breaks even at a point higher than the ATM strike.

- 7600 CE would have an intrinsic value of 165, hence this is the gain in Call option
- 7600 PE would expire worthless, hence the premium paid towards the option is lost
- The gain made in the 7600 CE is offset against the combined premium paid

Hence the strategy would breakeven at this point. **Scenario 5 – Market expires at 8000, call option makes money** Clearly the market in this scenario is way above the 7600 ATM mark. The call option premiums would swell, so much so that the gains in call option will more than offset the premiums paid. Let us check the numbers –

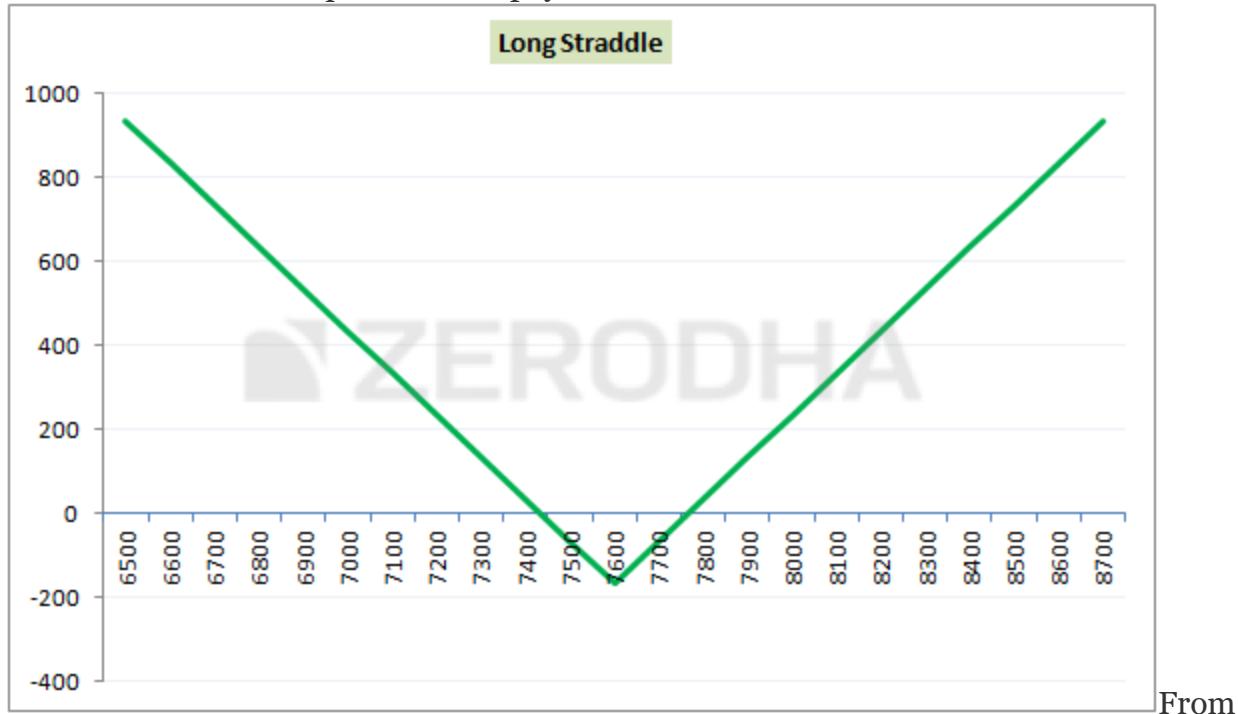
- 7600 PE will expire worthless, hence the premium paid i.e Rs.88 is to be written off
- At 8000, the 7600 CE will have an intrinsic value of 400
- The net payoff here is  $400 - 88 - 77 = +235$

| Market Expiry | CE_IV | PP  | CE Payoff | PE_IV | PP  | PE_Payoff | Strategy Payoff |
|---------------|-------|-----|-----------|-------|-----|-----------|-----------------|
| 6500          | 0     | -77 | -77       | 1100  | -88 | 1012      | 935             |
| 6600          | 0     | -77 | -77       | 1000  | -88 | 912       | 835             |
| 6700          | 0     | -77 | -77       | 900   | -88 | 812       | 735             |
| 6800          | 0     | -77 | -77       | 800   | -88 | 712       | 635             |
| 6900          | 0     | -77 | -77       | 700   | -88 | 612       | 535             |
| 7000          | 0     | -77 | -77       | 600   | -88 | 512       | 435             |
| 7100          | 0     | -77 | -77       | 500   | -88 | 412       | 335             |
| 7200          | 0     | -77 | -77       | 400   | -88 | 312       | 235             |
| 7300          | 0     | -77 | -77       | 300   | -88 | 212       | 135             |
| 7400          | 0     | -77 | -77       | 200   | -88 | 112       | 35              |
| 7500          | 0     | -77 | -77       | 100   | -88 | 12        | -65             |
| 7600          | 0     | -77 | -77       | 0     | -88 | -88       | -165            |
| 7700          | 100   | -77 | 23        | 0     | -88 | -88       | -65             |
| 7800          | 200   | -77 | 123       | 0     | -88 | -88       | 35              |
| 7900          | 300   | -77 | 223       | 0     | -88 | -88       | 135             |
| 8000          | 400   | -77 | 323       | 0     | -88 | -88       | 235             |
| 8100          | 500   | -77 | 423       | 0     | -88 | -88       | 335             |
| 8200          | 600   | -77 | 523       | 0     | -88 | -88       | 435             |
| 8300          | 700   | -77 | 623       | 0     | -88 | -88       | 535             |
| 8400          | 800   | -77 | 723       | 0     | -88 | -88       | 635             |
| 8500          | 900   | -77 | 823       | 0     | -88 | -88       | 735             |
| 8600          | 1000  | -77 | 923       | 0     | -88 | -88       | 835             |
| 8700          | 1100  | -77 | 1023      | 0     | -88 | -88       | 935             |

So as you can see, the gain in call option is significant enough to offset the combined premiums paid. Here is the payoff table at different market expiry levels. As you can observe –

1. The maximum loss (165) occurs at 7600, which is the ATM strike
2. The profits are unlimited in either direction of the market

We can visualize these points in the payoff structure here –



From

the V shaped payoff graph, the following things are quite clear –

1. With reference to the ATM strike, the strategy makes money in either direction
2. Maximum loss is experienced when markets don't move and stay at ATM
  - a. **Max loss = Net premium paid**
3. There are two breakevens – on either side, equidistant from ATM
  - a. **Upper Breakeven = ATM + Net premium**
  - b. **Lower Breakeven = ATM - Net premium**

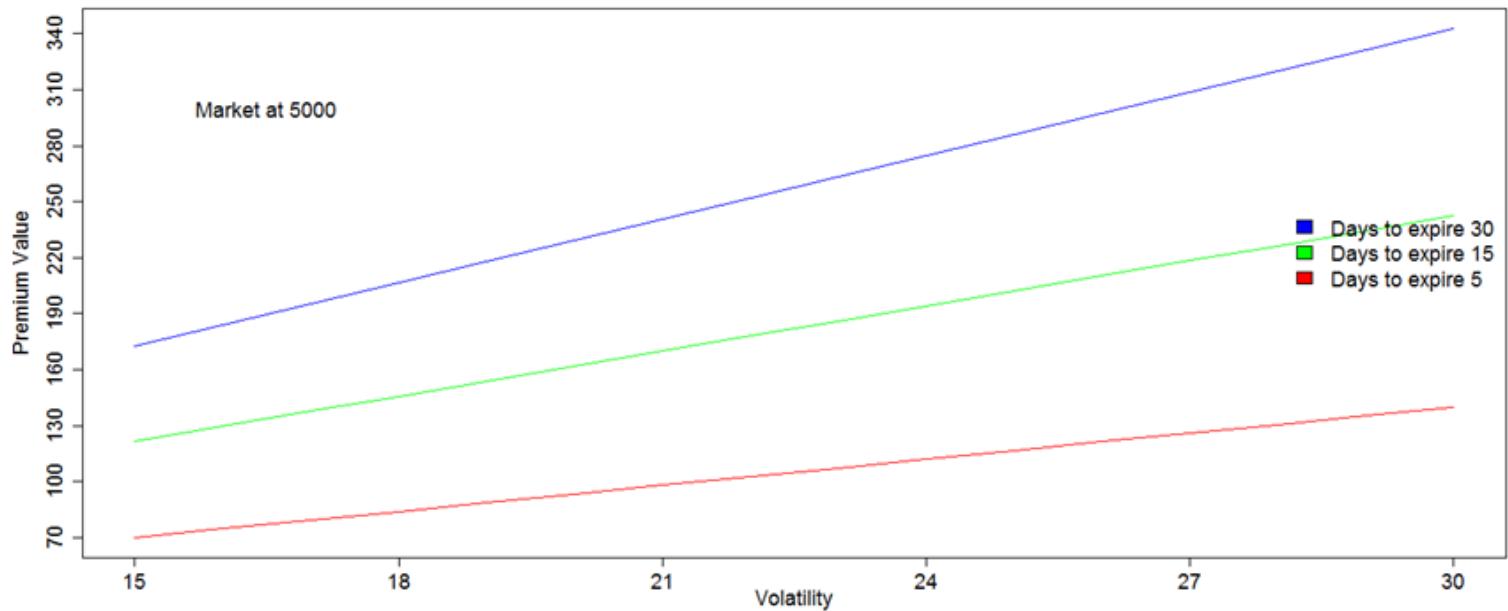
I'm certain, you find this strategy quite straight forward to understand and implement. In summary, you buy calls and puts, each leg has a limited down side, hence the combined position also has a limited downside and an unlimited profit potential. So in essence, a long straddle is like placing a bet on the price action each-way - you make money if the market goes up or down. Hence the direction does not matter here. But let me ask you this – if the direction does not matter, what else matters for this strategy?

## 10.3 – Volatility Matters

Yes, volatility matters quite a bit when you implement the straddle. I would not be exaggerating if I said that volatility makes or breaks the straddle. Hence a fair

assessment on volatility serves as the backbone for the straddle's success. Have a look at this graph below –The y-axis represents the cost of the strategy, which is simply the

**Straddle Premium Price vs Volatility**



combined premium of both the options and the x-axis represents volatility. The blue, green, and red line represents how the premium increases when the volatility increases given that there is 30, 15, and 5 days to expiry respectively. As you can see, this is a linear graph and irrespective of time to expiry, the strategy cost increases as and when the volatility increases. Likewise the strategy costs decreases when the volatility decreases. Have a look at the blue line; it suggests when volatility is 15%, the cost of setting up a long straddle is 160. Remember the cost of a long straddle represents the combined premium required to buy both call and put options. So at 15% volatility it costs Rs.160 to set up the long straddle, however keeping all else equal, when volatility increases to 30% it costs Rs.340 to set up the same long straddle. In other words, you are likely to double your money in the straddle provided –

1. You set up the long straddle at the start of the month
2. The volatility at the time of setting up the long straddle is relatively low
3. After you set up the long straddle, the volatility doubles

You can make similar observations with the green and red line which represents the 'price to volatility' behavior when the time to expiry is 15 and 5 days respectively. Now, this also means you will lose money if you execute the straddle when the volatility is

high which starts to decline after you execute the long straddle. **This is an extremely crucial point to remember.** At this point, let us have a quick discussion on the overall strategy's delta. Since we are long on ATM strike, the delta of both the options is close to 0.5.

- The call option has a delta of + 0.5
- The put option has a delta of - 0.5

The delta of call option offsets the delta of put option thereby resulting in a net '0' overall delta. Recall, delta shows the direction bias of the position. A +ve delta indicates a bullish bias and a -ve delta indicates a bearish bias. Given this, a 0 delta indicates that there is no bias whatsoever to the direction of the market. So all strategies which have zero deltas are called 'Delta Neutral' and Delta Neutral strategies are insulated against the market direction.

## 10.4 – What can go wrong with the straddle?

On the face of it a long straddle looks great. Think about it – you get to make money whichever way the market decides to move. All you need is the right volatility estimate. Therefore, what can really go wrong with a straddle? Well, two things come in between you and the profitability of a long straddle –

1. **Theta Decay** – All else equal, options are depreciating assets and this particularly hurts long positions. The closer you get to expiration, the lesser time value of the option. Time decay accelerates exponentially during the last week before expiration, so you do not want to hold onto out-of-the-money or at-the-money options into the last week and lose premiums rapidly.
2. **Large breakevens** – Recollect, in the example we discussed earlier, the breakeven points were 165 points away from the ATM strike. The lower breakeven point was 7435 and the upper breakeven was 7765, considering the ATM strike was 7600. In percentage terms, the market has to move 2.2% (either ways) to achieve breakeven. This means that from the time you initiate the straddle, the market or the stock has to move atleast 2.2% either ways for you to start making money...and this move has to happen within a maximum of 30 days. Further if you want to make a profit of atleast 1% on this trade, then we are talking about a 1% move over and above 2.2% on the index. Such large move on

the index is quite a challenge in my opinion and I will explain why in the next chapter.

Keeping the above two points plus the impact on volatility in perspective, we can summarize what really needs to work in your favor for the straddle to be profitable -

1. The volatility should be relatively low at the time of strategy execution
2. The volatility should increase during the holding period of the strategy
3. The market should make a large move – the direction of the move does not matter
4. The expected large move is time bound, should happen quickly – well within the expiry

From my experience trading long straddles, they are profitable when setup around major market events and the impact of such events should exceed over and above what the market expects. Let me explain the ‘event and expectation’ part a bit more, please do read the following carefully. Let us take the Infosys results as an example here. **Event** - Quarterly results of Infosys **Expectation** – ‘Muted to flat’ revenue guideline for the coming few quarters. **Actual Outcome** – As expected Infosys announces ‘muted to flat’ revenue guideline for the coming few quarters. If you were to set up a long straddle in the backdrop of such an event (and its expectation), and eventually the expectation is matched, then chances are that the straddle would fall apart. This is because around major events, volatility tends to increase which tends to drive the premium high. So if you are to buy ATM call and put options just around the corner of an event, then you are essentially buying options when the volatility is high. When events are announced and the outcome is known, the volatility drops like a ball, and therefore the premiums. This naturally breaks the straddle down and the trader would lose money owing to the ‘bought at high volatility and sold at low volatility’ phenomena. I’ve noticed this happening over and over again, and unfortunately have seen many traders lose money exactly for this reason. **Favorable Outcome** – However imagine, instead of ‘muted to flat’ guideline they announce an ‘aggressive’ guideline. This would essentially take the market by surprise and drive premiums much higher, resulting in a profitable straddle trade. This means there is another angle to straddles – your assessment of the event’s outcome should be couple of notches better than the general market’s assessment. You cannot setup a straddle with a mediocre assessment of events and its outcome. This may seem like a difficult proposition but you will have to trust me here – few quality years of

trading experience will actually get you to assess situations way better than the rest of the market. So, just for clarity, I'd like to repost all the angles which need to be aligned for the straddle to be profitable –

1. The volatility should be relatively low at the time of strategy execution
2. The volatility should increase during the holding period of the strategy
3. The market should make a large move – the direction of the move does not matter
4. The expected large move is time bound, should happen quickly – well within the expiry
5. Long straddles are to be set around major events, and the outcome of these events to be drastically different from the general market expectation.

You may be wondering there are far too many points that come in between you and the long straddle's profitability. But worry not, I'll share an antidote in the next chapter – The Short Straddle, and why it makes sense. [Download](#) the long straddle excel.

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## Key takeaways from this chapter

1. Strategies which are insulated to market direction are called 'Market Neutral' or 'Delta neutral'
2. Market neutral strategies such as long straddle makes money either which way the market moves
3. Long straddle requires you to simultaneously buy the ATM Call and Put option. The options should belong to the same underlying, same strike, and same expiry
4. By buying the CE and PE – the trader is placing the bet on either direction
5. The maximum loss is equal to the net premium paid, and it occurs at the strike at which the long straddle has been initiated
6. The upper breakeven is 'strike + net premium'. The lower breakeven is 'strike – net premium'
7. The deltas in a long straddle adds up to zero
8. The volatility should be relatively low at the time of strategy execution
9. The volatility should increase during the holding period of the strategy
10. The market should make a large move – the direction of the move does not matter

11. The expected large move is time bound, should happen quickly – well within the expiry
12. Long straddles are to be set around major events, and the outcome of these events to be drastically different from the general market expectation.

# The Short Straddle

## 11.1 – Context

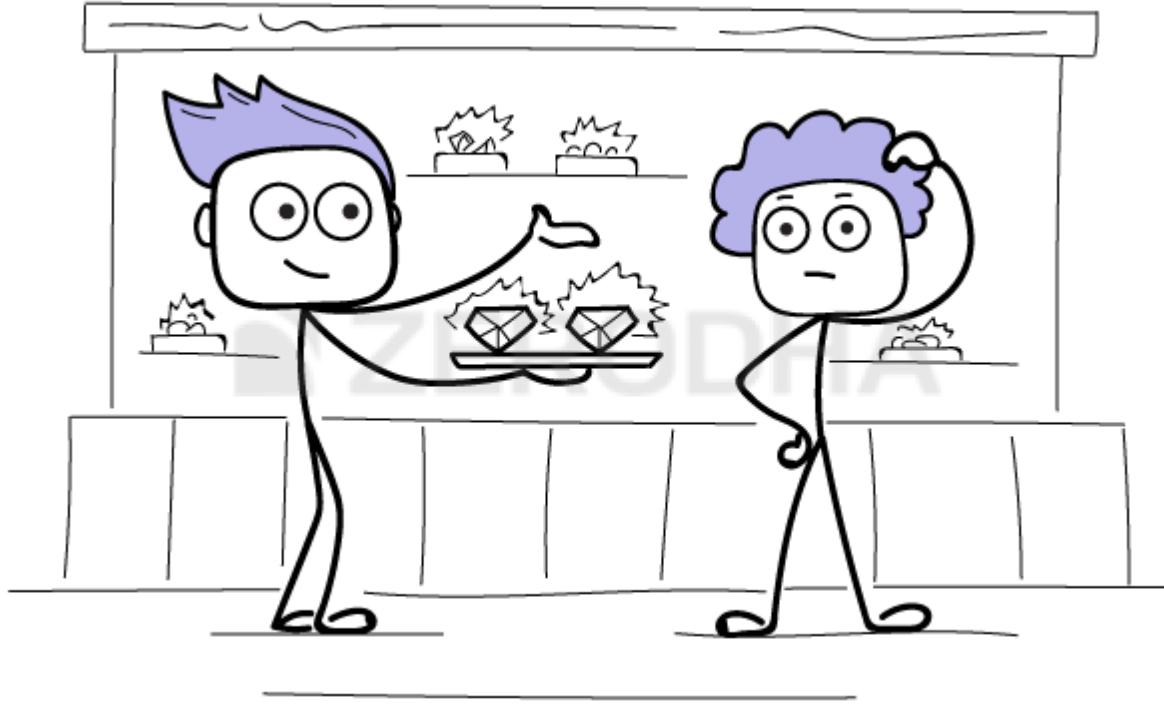
In the previous chapter we understood that for the long straddle to be profitable, we need a set of things to work in our favor, reposting the same for your quick reference –

1. The volatility should be relatively low at the time of strategy execution
2. The volatility should increase during the holding period of the strategy
3. The market should make a large move – the direction of the move does not matter
4. The expected large move is time bound, should happen quickly – well within the expiry
5. Long straddles are to be setup around major events, and the outcome of these events to be drastically different from the general market expectation.

Agreed that the directional movement of the market does not matter in the long straddle, but the bargain here is quite hard. Considering the 5 points list, getting the long straddle to work in you favor is quite a challenge. Do recall, in the previous chapter the breakdown was at 2%, add to this another 1% as desired profits and we are essentially looking for, at least a 3% move on the index. From my experience expecting the market to make such moves regularly is quite a challenge. In fact for this reason alone, I think twice each and every time I need to initiate a long straddle.

I have witnessed many traders recklessly set up long straddles thinking they are insulated to the market's directional movement. But in reality they end up losing money in a long straddle – time delay and the general movement in the market (or the lack of it) works against them. Please note, I'm not trying to discourage you from employing the long straddle, no one denies the simplicity and elegance of a long straddle. It works extremely well when all the 5 points above are aligned. My only issue with long straddle is the probability of these 5 points aligning with each other.

Now think about this – there are quite a few factors which prevent the long straddle to be profitable. So as an extension of this – the same set of factors ‘**should**’ favor the opposite of a long straddle, i.e the ‘Short Straddle’.



## 11.2 – The Short Straddle

Although many traders fear the short straddle (as losses are uncapped), I personally prefer trading the short straddle on certain occasions over its peer strategies. Anyway let us quickly understand the set up of a short straddle, and how its P&L behaves across various scenarios.

Setting up a short straddle is quite straight forward – as opposed to buying the ATM Call and Put options (like in long straddle) you just have to sell the ATM Call and Put option. Obviously the short strategy is set up for a net credit, as when you sell the ATM options, you receive the premium in your account.

Here is any example, consider Nifty is at 7589, so this would make the 7600 strike ATM. The option premiums are as follows –

- 7600 CE is trading at 77
- 7600 PE is trading at 88

So the short straddle will require us to sell both these options and collect the net premium of  $77 + 88 = 165$ .

Please do note – the options should belong to the same underlying, same expiry, and of course same strike. So assuming you have executed this short straddle, let's figure out the P&L at various market expiry scenarios.

### **Scenario 1 – Market expires at 7200 (we lose money on put option)**

This is a scenario where the loss in the put option is so large that it eats away the premium collected by both the CE and PE, resulting in an overall loss. At 7200 –

- 7600 CE will expire worthless, hence we get to retain the premium received i.e 77
- 7600 PE will have an intrinsic value of 400. After adjusting for the premium received i.e Rs.88, we lose  $400 - 88 = -312$
- The net loss would be  $312 - 77 = -235$

As you can see, the gain in call option is offset by the loss in the put option.

### **Scenario 2 – Market expires at 7435 (lower breakdown)**

This is a situation where the strategy neither makes money nor loses any money.

- 7600 CE would expire worthless; hence the premium received is retained. Profit here is Rs.77
- 7600 PE would have an intrinsic value of 165, out of which we have received Rs.88 as premium, hence our loss would be  $165 - 88 = -77$
- The gain in the call option is completely offset by the loss in the put option. Hence we neither make money nor lose money at 7435.

### **Scenario 3 – Market expires at 7600 (at the ATM strike, maximum profit)**

This is the most favorable outcome for a short straddle. At 7600, the situation is quite straight forward as both the call and put option would expire worthless and hence the

premium received from both the call and put option will be retained. The gain here would be equivalent to the net premium received i.e Rs.165.

So this means, in a short straddle you make maximum money when the markets don't move!

#### **Scenario 4 – Market expires at 7765 (upper breakdown)**

This is similar to the 2<sup>nd</sup> scenario we discussed. This is a point at which the strategy breaks even at a point higher than the ATM strike.

- 7600 CE would have an intrinsic value of 165, hence after adjusting for the premium received of Rs. 77, we stand to lose Rs.88 ( $165 - 77$ )
- 7600 PE would expire worthless, hence the premium received i.e Rs.88 is retained
- The gain made in the 7600 PE is offset against the loss on the 7600 CE, hence we neither make money nor lose money.

Clearly this is the upper breakdown point.

#### **Scenario 5 – Market expires at 8000 (we lose money on call option)**

Clearly the market in this scenario is way above the 7600 ATM mark. The call option premium would swell, so would the loss –

- 7600 PE will expire worthless, hence the premium received i.e Rs.88 is retained
- At 8000, the 7600 CE will have an intrinsic value of 400, hence after adjusting for the premium received of Rs. 77, we stand to lose Rs. 323( $400 - 77$ )
- We have received Rs.88 as premium for the Put option, therefore the loss would be  $88 - 323 = \textcolor{red}{-235}$

So as you can see, the loss in the call option is significant enough to offset the combined premiums received.

Here is the payoff table at different market expiry levels.

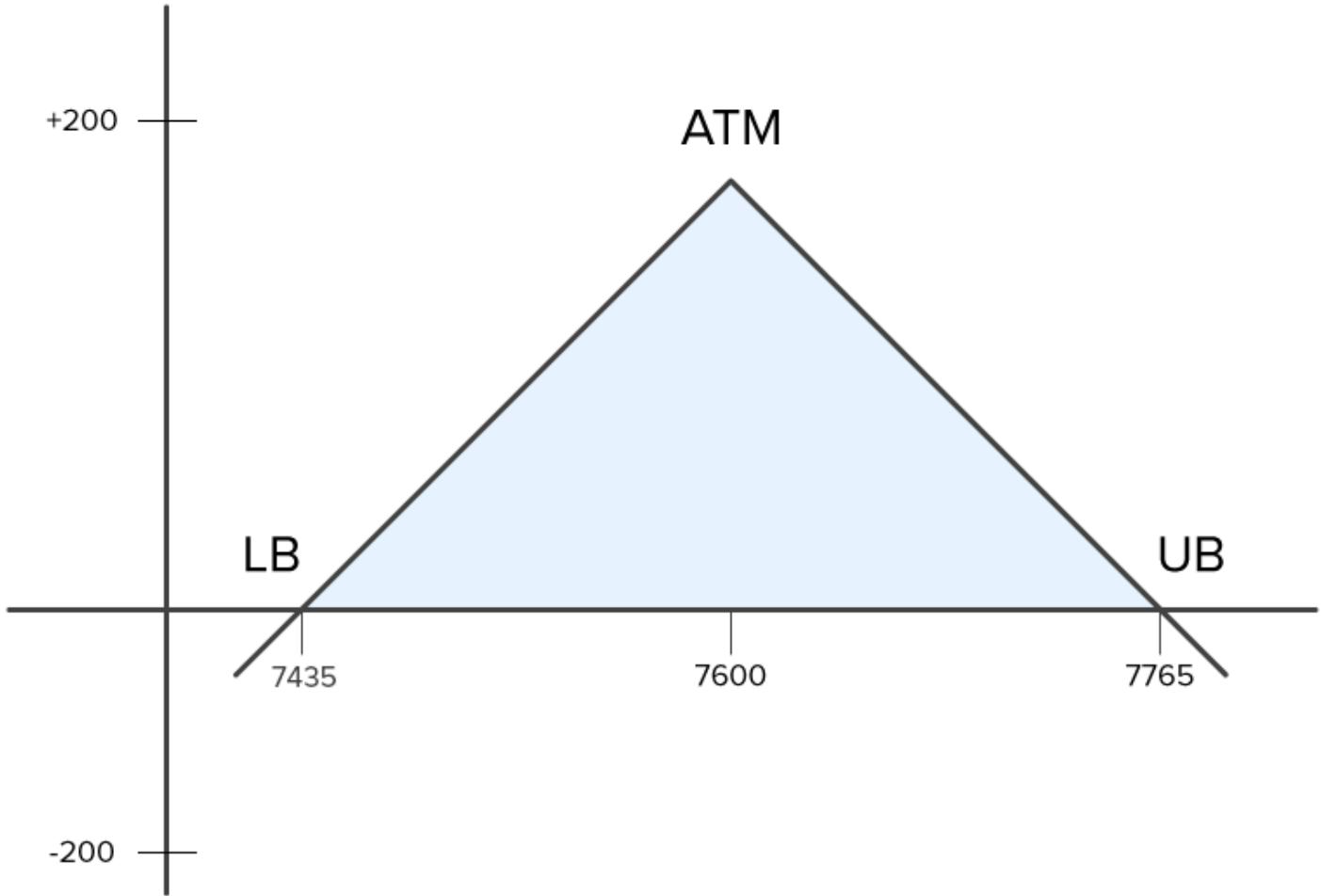
| Market Expiry | CE_IV | PR | CE Payoff | PE_IV | PR | PE_Payoff | Strategy Payoff |
|---------------|-------|----|-----------|-------|----|-----------|-----------------|
| 6500          | 0     | 77 | 77        | 1100  | 88 | -1012     | -935            |
| 6600          | 0     | 77 | 77        | 1000  | 88 | -912      | -835            |
| 6700          | 0     | 77 | 77        | 900   | 88 | -812      | -735            |
| 6800          | 0     | 77 | 77        | 800   | 88 | -712      | -635            |
| 6900          | 0     | 77 | 77        | 700   | 88 | -612      | -535            |
| 7000          | 0     | 77 | 77        | 600   | 88 | -512      | -435            |
| 7100          | 0     | 77 | 77        | 500   | 88 | -412      | -335            |
| 7200          | 0     | 77 | 77        | 400   | 88 | -312      | -235            |
| 7300          | 0     | 77 | 77        | 300   | 88 | -212      | -135            |
| 7400          | 0     | 77 | 77        | 200   | 88 | -112      | -35             |
| 7500          | 0     | 77 | 77        | 100   | 88 | -12       | 65              |
| 7600          | 0     | 77 | 77        | 0     | 88 | 88        | 165             |
| 7700          | 100   | 77 | -23       | 0     | 88 | 88        | 65              |
| 7800          | 200   | 77 | -123      | 0     | 88 | 88        | -35             |
| 7900          | 300   | 77 | -223      | 0     | 88 | 88        | -135            |
| 8000          | 400   | 77 | -323      | 0     | 88 | 88        | -235            |
| 8100          | 500   | 77 | -423      | 0     | 88 | 88        | -335            |
| 8200          | 600   | 77 | -523      | 0     | 88 | 88        | -435            |
| 8300          | 700   | 77 | -623      | 0     | 88 | 88        | -535            |
| 8400          | 800   | 77 | -723      | 0     | 88 | 88        | -635            |
| 8500          | 900   | 77 | -823      | 0     | 88 | 88        | -735            |

As you can observe –

1. The maximum profit 165 occurs at 7600, which is the ATM strike
2. The strategy remains profitable only between the lower and higher breakdown numbers
3. The losses are unlimited in either direction of the market

We can visualize these points in the payoff structure here –

From the inverted V shaped payoff graph, the following things are quite clear –



1. The point at which you can experience maximum profits is at ATM, the profits shrink as you move away from the ATM mark
2. The strategy is profitable as long as the market stays within the breakdown points
3. Maximum loss is experienced when markets move further away from the breakdown point. The further away the market moves from the breakdown point, higher the loss
  - a. Max loss = Unlimited
4. There are two breakdown points – on either side, equidistant from ATM
  - a. Upper Breakdown = ATM + Net premium
  - b. Lower Breakdown = ATM – Net premium

As you may have realized by now, the short straddle works exactly opposite to the long straddle. Short straddle works best when markets are expected to be in a range and not really expected to make a large move.

Many traders fear short straddle considering the fact that short straddles have unlimited losses on either side. However from my experience, short straddles work really well if you know how exactly to deploy this. In fact in the last chapter of the previous module, I had posted a case study involving short straddle. Probably that was one of the best examples of when to implement the short straddle.

I will repost the same again here and I hope you will be able to appreciate the case study better.

### **11.3 – Case Study (repost from previous module)**

The following case study was a part of [\*\*Module 5, Chapter 23\*\*](#). I'm reposting the same here as I assume you would appreciate the example better at this stage. To get the complete context, I'd request you to read the chapter.

Infosys was expected to announce their Q2 results on 12<sup>th</sup> October. The idea was simple – news drives volatility up, so short options with an expectation that you can buy it back when the volatility cools off. The trade was well planned and the position was initiated on 8<sup>th</sup> Oct - 4 days prior to the event.

Infosys was trading close to Rs.1142/- per share, so he decided to go ahead with the 1140 strike (ATM).

Here is the snapshot at the time of initiating the trade -

## Option Chain (Equity Derivatives)

Underlying Stock: INFY 1142.60 As on Oct 08, 2015 10:36:06 IST 

| View Options Contracts for: |                  |            | Select Index ▾ | OR    | Search for an underlying stock: | GO       | Filter by: | Expiry Date | 29OCT2015 ▾ | Futures contracts |              |         |           |           |         |          |       |       |        |            |                  |              |
|-----------------------------|------------------|------------|----------------|-------|---------------------------------|----------|------------|-------------|-------------|-------------------|--------------|---------|-----------|-----------|---------|----------|-------|-------|--------|------------|------------------|--------------|
| CALLS                       |                  |            |                |       |                                 |          |            |             |             |                   | PUTS         |         |           |           |         |          |       |       |        |            |                  |              |
| Chart                       | OI               | Chng in OI | Volume         | IV    | LTP                             | Net Chng | Bid Qty    | Bid Price   | Ask Price   | Ask Qty           | Strike Price | Bid Qty | Bid Price | Ask Price | Ask Qty | Net Chng | LTP   | IV    | Volume | Chng in OI | OI               | Chart        |
|                             | -                | -          | -              | -     | -                               | -        | 1,250      | 273.00      | -           | -                 | 760.00       | -       | -         | -         | -       | -        | -     | -     | -      | -          | -                |              |
|                             | -                | -          | -              | -     | -                               | -        | 1,250      | 252.50      | -           | -                 | 780.00       | -       | -         | -         | -       | -        | -     | -     | -      | -          | -                |              |
| 3,500                       | -                | -          | -              | -     | -                               | -        | 1,500      | 233.00      | -           | -                 | 800.00       | 3,250   | 0.05      | 1.95      | 250     | -        | -     | -     | -      | -          | -                | 250          |
|                             | -                | -          | -              | -     | -                               | -        | 1,500      | 213.00      | -           | -                 | 820.00       | -       | -         | -         | -       | -        | -     | -     | -      | -          | -                |              |
|                             | -                | -          | -              | -     | -                               | -        | 1,500      | 193.00      | -           | -                 | 840.00       | -       | -         | -         | -       | -        | -     | -     | -      | -          | -                |              |
|                             | -                | -          | -              | -     | -                               | -        | 1,500      | 173.00      | -           | -                 | 860.00       | -       | -         | 3.00      | 250     | -        | -     | -     | -      | -          | -                |              |
|                             | -                | -          | -              | -     | -                               | -        | 1,500      | 153.50      | -           | -                 | 880.00       | -       | -         | -         | -       | -        | -     | -     | -      | -          | -                |              |
|                             | -                | -          | -              | -     | -                               | -        | 1,500      | 233.80      | 243.25      | 1,500             | 900.00       | 1,000   | 2.00      | 3.00      | 2,250   | -        | -     | -     | -      | -          | -                | 15,250       |
|                             | -                | -          | -              | -     | -                               | -        | 1,500      | 214.55      | 223.90      | 1,500             | 920.00       | 3,500   | 1.15      | 4.85      | 3,000   | -        | -     | -     | -      | -          | -                | 750          |
|                             | -                | -          | -              | -     | -                               | -        | 1,500      | 195.80      | 206.30      | 1,500             | 940.00       | 500     | 2.50      | 4.45      | 3,000   | -        | -     | -     | -      | -          | -                | 10,000       |
| 5,250                       | -                | -          | -              | -     | -                               | -        | 1,500      | 175.55      | -           | -                 | 960.00       | 250     | 3.50      | 3.85      | 1,750   | -0.40    | 3.70  | 50.35 | 8      | 250        | 46,250           |              |
| 750                         | -                | -          | -              | -     | -                               | -        | 2,250      | 59.00       | -           | -                 | 980.00       | 500     | 4.90      | 5.10      | 1,250   | -1.30    | 5.10  | 49.11 | 43     | 2,000      | 28,000           |              |
| 13,500                      | -                | -          | -              | -     | -                               | -        | 2,250      | 142.25      | -           | -                 | 1000.00      | 20,750  | 6.90      | 7.15      | 3,250   | -0.95    | 7.15  | 48.75 | 366    | 6,000      | 228,250          |              |
| 12,500                      | -                | -          | -              | -     | -                               | -        | 2,250      | 124.50      | -           | -                 | 1020.00      | 250     | 9.35      | 9.70      | 3,000   | -1.70    | 9.60  | 48.51 | 93     | 2,000      | 56,000           |              |
| 2,750                       | -                | -          | -              | -     | -                               | -        | 4,500      | 105.50      | 114.45      | 500               | 1040.00      | 250     | 12.70     | 12.90     | 500     | -2.30    | 12.95 | 47.66 | 348    | 28,250     | 233,500          |              |
| 8,500                       | -                | -          | -              | -     | -                               | -        | 5,250      | 91.00       | 99.15       | 3,000             | 1060.00      | 750     | 17.05     | 17.35     | 500     | -3.35    | 17.00 | 47.59 | 139    | -          | 209,500          |              |
| 7,250                       | 250              | 2,41,28    | 87.50          | 11.50 | 4,250                           | 80.05    | 85.10      | 5,500       | 1080.00     | 750               | 22.75        | 23.10   | 500       | -3.75     | 22.85   | 47.59    | 110   | 6,250 | 90,250 |            |                  |              |
| 113,750                     | -10,250          | 91         | 38.38          | 70.10 | 3,55                            | 3,000    | 69.15      | 71.70       | 4,750       | 1100.00           | 500          | 29.75   | 30.00     | 2,500     | -4.25   | 29.75    | 47.91 | 586   | 3,000  | 292,250    |                  |              |
| 192,250                     | -                | 165        | 39.94          | 59.05 | 3.05                            | 250      | 58.45      | 59.05       | 750         | 1120.00           | 250          | 37.85   | 38.15     | 750       | -5.35   | 37.95    | 47.96 | 325   | 1,750  | 379,250    |                  |              |
| 602,500                     | 52,750           | 1,103      | 40.26          | 48.00 | 3.55                            | 750      | 47.70      | 48.20       | 250         | 1140.00           | 2,250        | 46.95   | 47.45     | 250       | -5.40   | 47.00    | 48.00 | 823   | 67,250 | 497,500    |                  |              |
| 255,000                     | 35,500           | 609        | 41.18          | 39.95 | 3.15                            | 1,500    | 39.30      | 40.00       | 750         | 1160.00           | 2,750        | 58.40   | 59.80     | 250       | -6.00   | 58.40    | 49.13 | 36    | -      | 121,250    |                  |              |
| 173,750                     | 20,250           | 263        | 41.85          | 33.00 | 2.60                            | 250      | 32.50      | 32.80       | 750         | 1180.00           | 4,000        | 70.85   | 74.45     | 5,000     | -6.35   | 70.50    | 49.29 | 5     | -      | 47,000     |                  |              |
| 1,021,250                   | 57,500           | 1,170      | 42.88          | 26.90 | 1.65                            | 250      | 26.70      | 26.95       | 750         | 1200.00           | 500          | 84.50   | 86.40     | 4,000     | -6.00   | 85.00    | 51.66 | 6     | -      | 500        | 40,000           |              |
| 382,500                     | 3,250            | 150        | 43.46          | 21.35 | 1.25                            | 1,500    | 21.25      | 21.70       | 3,000       | 1220.00           | 4,500        | 94.85   | 105.55    | 1,750     | -       | -        | -     | -     | -      | -          | 750              |              |
| 195,750                     | 19,750           | 308        | 43.65          | 16.50 | 0.15                            | 750      | 16.60      | 16.80       | 250         | 1240.00           | 4,250        | 108.75  | 127.55    | 2,000     | -       | -        | -     | -     | -      | -          | 500              |              |
| 222,500                     | 7,000            | 203        | 43.99          | 13.10 | 0.30                            | 750      | 12.90      | 13.10       | 1,000       | 1260.00           | -            | -       | -         | -         | -       | -        | -     | -     | -      | -          | 500              |              |
| 130,750                     | 16,000           | 152        | 44.37          | 10.00 | -0.10                           | 1,750    | 10.00      | 10.25       | 250         | 1280.00           | 2,500        | 144.00  | -         | -         | -       | -        | -     | -     | -      | -          | -                | 250          |
| 500,250                     | 26,250           | 539        | 44.67          | 7.85  | -0.30                           | 2,000    | 7.80       | 8.15        | 6,000       | 1300.00           | 500          | 68.00   | 167.35    | 500       | -       | -        | -     | -     | -      | -          | 11,250           |              |
| 75,000                      | 9,000            | 70         | 45.06          | 6.10  | -0.15                           | 1,750    | 5.95       | 6.20        | 500         | 1320.00           | 1,500        | 178.25  | 190.00    | 1,500     | -       | -        | -     | -     | -      | -          | -                |              |
| 49,750                      | 2,000            | 23         | 45.56          | 5.00  | 0.15                            | 750      | 4.60       | 4.85        | 750         | 1340.00           | 2,250        | 194.65  | -         | -         | -       | -        | -     | -     | -      | -          | 250              |              |
| 33,250                      | 4,250            | 46         | 45.93          | 3.50  | -0.50                           | 1,500    | 3.55       | 3.70        | 250         | 1360.00           | 1,500        | 215.80  | 225.35    | 1,500     | -       | -        | -     | -     | -      | -          | 250              |              |
| 64,000                      | 4,000            | 21         | 46.44          | 3.00  | -0.30                           | 1,500    | 2.65       | 2.85        | 2,250       | 1380.00           | 750          | 233.80  | 243.95    | 750       | -       | -        | -     | -     | -      | -          | -                |              |
| <b>Total</b>                | <b>4,066,250</b> |            |                |       |                                 |          |            |             |             |                   |              |         |           |           |         |          |       |       |        |            | <b>2,309,000</b> | <b>Total</b> |

On 8<sup>th</sup> October around 10:35 AM the 1140 CE was trading at 48/- and the implied volatility was at 40.26%. The 1140 PE was trading at 47/- and the implied volatility was at 48%. The combined premium received was 95 per lot.

Market's expectation was that Infosys would announce fairly decent set of numbers. In fact the numbers were better than expected, here are the details -

"For the July-September quarter, Infosys posted a net profit of \$519 million, compared with \$511 million in the year-ago period. Revenue jumped 8.7 % to \$2.39 billion. On a sequential basis, revenue grew 6%, comfortably eclipsing market expectations of 4- 4.5% growth.

In rupee terms, net profit rose 9.8% to Rs.3398 crore on revenue of Rs. 15,635 crore, which was up 17.2% from last year". Source: *Economic Times*.

The announcement came in around 9:18 AM, 3 minutes after the market opened, and this trader did manage to close the trade around the same time.

Here is the snapshot -

### Option Chain (Equity Derivatives)

Underlying Stock: INFY 1187.15 As on Oct 12, 2015 09:21:04 IST 

| View Options Contracts for:   |            |            | Select Index ▾ | OR    | Search for an underlying stock: | GO       | Filter by: | Expiry Date | 29OCT2015 ▾ | Futures contracts |              |         |           |           |         |          |        |       |        |            |           |   |   |
|---|------------|------------|----------------|-------|---------------------------------|----------|------------|-------------|-------------|-------------------|--------------|---------|-----------|-----------|---------|----------|--------|-------|--------|------------|-----------|---|---|
| CALLS   |            |            |                |       |                                 |          |            |             |             |                   | PUTS         |         |           |           |         |          |        |       |        |            |           |   |   |
| Chart   | OI         | Chng in OI | Volume         | IV    | LTP                             | Net Chng | Bid Qty    | Bid Price   | Ask Price   | Ask Qty           | Strike Price | Bid Qty | Bid Price | Ask Price | Ask Qty | Net Chng | LTP    | IV    | Volume | Chng in OI | OI        | Chart   |   |
|    | 3,500      | -          | -              | -     | -                               | -        | -1,250     | 245.50      | -           | -                 | 800.00       | 4,000   | 0.20      | -         | -       | -        | -      | -     | -      | -          | 500       |    |   |
|    | -          | -          | -              | -     | -                               | -        | -1,000     | 241.00      | -           | -                 | 820.00       | -       | -         | -         | -       | -        | -      | -     | -      | -          | -         |    |   |
|    | -          | -          | -              | -     | -                               | -        | -1,250     | 221.00      | -           | -                 | 840.00       | -       | -         | -         | -       | -        | -      | -     | -      | -          | -         |    |   |
|    | -          | -          | -              | -     | -                               | -        | -1,000     | 201.00      | -           | -                 | 860.00       | -       | -         | -         | -       | -        | -      | -     | -      | -          | -         |    |   |
|    | -          | -          | -              | -     | -                               | -        | -1,250     | 181.00      | -           | -                 | 880.00       | -       | -         | -3.00     | 1,250   | -        | -      | -     | -      | -          | -         |    |   |
|    | 750        | -          | -              | -     | -                               | -        | -1,500     | 140.00      | -           | -                 | 900.00       | 1,000   | 1.20      | 1.30      | 8,500   | -1.35    | 1.25   | 64.84 | 175    | -2,750     | 389,250   |    |   |
|    | 250        | -          | -              | -     | -                               | -        | -1,250     | 159.05      | -           | -                 | 920.00       | 250     | 1.15      | 1.30      | 2,750   | -1.70    | 1.15   | 61.87 | 13     | -500       | 5,500     |    |   |
|    | -          | -          | -              | -     | -                               | -        | -1,500     | 127.60      | -           | -                 | 940.00       | 750     | 1.35      | 1.45      | 250     | -1.70    | 1.40   | 59.07 | 39     | -1,000     | 23,250    |    |   |
|    | 5,250      | -          | -              | -     | -                               | -        | -1,500     | 107.00      | -           | -                 | 960.00       | 250     | 1.50      | 1.75      | 500     | -2.15    | 1.75   | 55.73 | 39     | 1,750      | 69,750    |    |   |
|    | 750        | -          | -              | -     | -                               | -        | -1,500     | 87.00       | -           | -                 | 980.00       | 250     | 1.80      | 1.95      | 500     | -2.70    | 1.90   | 52.26 | 73     | 1,000      | 62,250    |    |   |
|    | 13,250     | -          | -              | -     | -                               | -        | -250       | 178.60      | 196.90      | 250               | 1000.00      | 1,500   | 2.30      | 2.50      | 4,250   | -3.60    | 2.35   | 50.59 | 717    | 23,500     | 675,250   |    |   |
|  | 12,500     | -          | -              | -     | -                               | -        | -1,750     | 51.00       | -           | -                 | 1020.00      | 250     | 2.65      | 2.85      | 1,250   | -5.00    | 2.60   | 47.90 | 210    | 5,000      | 131,250   |  |   |
|  | 3,250      | -          | -              | -     | -                               | -        | -1,250     | 24.00       | -           | -                 | 1040.00      | 1,250   | 3.65      | 3.90      | 500     | -6.20    | 3.75   | 46.26 | 744    | -17,250    | 426,000   |  |   |
|  | 8,750      | -          | 1              | -     | 125.40                          | 7.20     | 250        | 131.05      | 199.00      | 500               | 1060.00      | 250     | 4.90      | 5.35      | 750     | -7.85    | 5.35   | 43.50 | 1,219  | -6,750     | 960,000   |  |   |
|  | 9,250      | 1,750      | 10             | -     | 111.05                          | 4.15     | 2,500      | 112.10      | 121.80      | 500               | 1080.00      | 750     | 6.70      | 7.00      | 5,250   | -10.95   | 7.00   | 43.24 | 561    | -7,000     | 266,500   |  |   |
|  | 157,250    | -500       | 95             | -     | 96.90                           | 7.10     | 250        | 95.10       | 97.55       | 250               | 1100.00      | 250     | 9.95      | 10.15     | 250     | -14.20   | 10.00  | 42.59 | 2,384  | 107,000    | 1,054,000 |  |   |
|  | 336,250    | -5,750     | 66             | 24.09 | 81.45                           | 5.45     | 250        | 78.45       | 81.30       | 250               | 1120.00      | 1,000   | 13.90     | 13.95     | 250     | -17.40   | 13.90  | 41.30 | 1,082  | 41,000     | 614,500   |  |   |
|  | 1,012,500  | -27,750    | 607            | 28.18 | 55.00                           | -10.65   | 250        | 53.50       | 57.35       | 250               | 1140.00      | 500     | 20.00     | 20.40     | 750     | -19.00   | 20.35  | 40.44 | 1,748  | 20,750     | 846,500   |  |   |
|  | 775,250    | -49,250    | 1,256          | 29.97 | 46.05                           | -8.90    | 250        | 44.55       | 45.95       | 250               | 1160.00      | 500     | 26.65     | 27.50     | 500     | -21.50   | 27.50  | 40.48 | 1,382  | 10,000     | 360,750   |  |   |
|  | 446,500    | 5,500      | 1,149          | 30.65 | 32.00                           | -13.80   | 250        | 31.80       | 33.65       | 250               | 1180.00      | 500     | 33.10     | 33.35     | 250     | -25.80   | 33.30  | 40.36 | 722    | 46,500     | 105,500   |  |   |
|  | 2,635,000  | 71,250     | 6,776          | 31.26 | 26.10                           | -11.45   | 500        | 25.15       | 26.10       | 250               | 1200.00      | 500     | 43.05     | 44.00     | 2,000   | -27.30   | 43.75  | 40.86 | 1,122  | 99,750     | 167,500   |  |   |
|  | 823,000    | 23,500     | 1,567          | 31.60 | 18.10                           | -11.10   | 250        | 18.00       | 18.70       | 1,250             | 1220.00      | 1,000   | 55.20     | 56.50     | 1,250   | -45.20   | 54.70  | 40.58 | 42     | 3,500      | 5,250     |  |   |
|  | 1,285,500  | -26,750    | 2,212          | 32.54 | 14.20                           | -8.75    | 250        | 13.70       | 14.10       | 250               | 1240.00      | 500     | 59.40     | 71.20     | 750     | -58.75   | 65.85  | 45.36 | 2      | -          | 750       |  |   |
|  | 633,000    | -6,000     | 1,817          | 33.10 | 9.70                            | -8.40    | 500        | 9.55        | 9.80        | 750               | 1260.00      | 750     | 60.15     | 114.05    | 750     | -        | -      | -     | -      | -          | 750       |  |   |
|  | 397,000    | 14,500     | 909            | 33.83 | 7.00                            | -7.00    | 500        | 7.00        | 7.65        | 1,250             | 1280.00      | 250     | 45.05     | 231.95    | 250     | -        | -      | -     | -      | -          | 500       |  |   |
|  | 1,259,000  | 77,250     | 2,422          | 35.31 | 6.10                            | -4.55    | 3,000      | 6.00        | 6.25        | 1,000             | 1300.00      | 250     | 78.05     | -         | -       | -26.85   | 118.15 | 51.87 | 15     | 1,500      | 13,000    |  |   |
|  | 216,500    | 11,750     | 446            | 34.90 | 4.40                            | -3.80    | 1,500      | 4.25        | 4.50        | 250               | 1320.00      | -       | -         | -         | -       | -        | -      | -     | -      | -          | -         |  |   |
|  | 165,000    | 44,250     | 476            | 36.41 | 4.00                            | -2.10    | 2,250      | 3.70        | 4.25        | 1,750             | 1340.00      | -       | -         | -         | -       | -        | -      | -     | -      | -          | 250       |  |   |
|  | 516,750    | 6,250      | 791            | 37.95 | 3.00                            | -1.95    | 250        | 2.90        | 3.00        | 2,750             | 1360.00      | -       | -         | 288.00    | 250     | -        | -      | -     | -      | -          | -         | 250   |  |
|  | 181,500    | 14,250     | 268            | 37.37 | 1.80                            | -1.75    | 1,000      | 1.75        | 1.90        | 250               | 1380.00      | -       | -         | -         | -       | -        | -      | -     | -      | -          | -         |  |   |
| Total   | 10,897,500 |            |                |       |                                 |          |            |             |             |                   |              |         |           |           |         |          |        |       |        | 6,179,000  | Total     |   |   |

The 1140 CE was trading at 55/- and the implied volatility had dropped to 28%. The 1140 PE was trading at 20/- and the implied volatility had dropped to 40%.

**Do pay attention to this - the speed at which the call option shot up was lesser than the speed at which the Put option dropped its value. The combined premium was 75 per lot, and he made a 20 point profit per lot.**

## 11.4 – The Greeks

Since we are dealing with ATM options, the delta of both CE and PE would be around 0.5. We could add the deltas of each option and get a sense of how the overall position deltas behave.

- 7600 CE Delta @ 0.5, since we are short, the delta would be -0.5
- 7600 PE Delta @ - 0.5, since we are short, the delta would be + 0.5
- Combined delta would be  $-0.5 + 0.5 = 0$

The combined delta indicates that the strategy is directional neutral. Remember both long and short straddle is delta neutral. In case of long straddle, delta neutral suggests that the profits are uncapped and in case of short straddle, the losses are uncapped.

Now here is something for you to think about – When you initiate a straddle you are obviously delta neutral. But as the markets move, will your position still remain delta neutral? If yes, why do you think so? If no, then is there a way to keep the position delta neutral?

If you can build your thoughts around these points, then I can guarantee you that your options knowledge is far greater than 90% of the market participants. To answer these simple questions, you will need to step a little deeper and get into 2<sup>nd</sup> level of thinking.

Do post your comments below.

You can [\*\*download\*\*](#) the Short straddle excel.

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## Key takeaways from this chapter

1. Short straddle requires you to simultaneously Sell the ATM Call and Put option. The options should belong to the same underlying, same strike, and same expiry
2. By selling the CE and PE – the trader is placing the bet that the market wont move and would essentially stay in a range
3. The maximum profit is equal to the net premium paid, and it occurs at the strike at which the long straddle has been initiated

4. The upper breakdown is ‘strike + net premium’. The lower breakdown is ‘strike – net premium’
5. The deltas in a short straddle adds up to zero
6. The volatility should be relatively high at the time of strategy execution
7. The volatility should decrease during the holding period of the strategy
8. Short straddles can be set around major events, wherein before the event, the volatility would drive the premiums up and just after the announcement, the volatility would cool off, and so would the premiums.

# The Long & Short Straddle

## 12.1 – Background

If you have understood the straddle, then understanding the ‘Strangle’ is quite straightforward. For all practical purposes, the thought process behind the straddle and strangle is quite similar. Strangle is an improvisation over the straddle, mainly to reduce the cost of implementation. Let me explain this further.

Consider this – Nifty is trading at 5921, which would make 5900 the ATM strike. If you were to set up the long straddle here, you would be required to buy the 5900 CE and 5900 PE. The premiums for both these options are 66 and 57 respectively.

Net cash outlay =  $66 + 57 = 123$

Upper breakeven =  $5921 + 123 = 6044$

Lower breakeven =  $5921 - 123 = 5798$

Therefore to set up a straddle, you spend 123 and the breakeven on either side is 2.07% away. As you know the straddle is delta neutral, meaning the strategy is insulated to the directional movement of the market. The idea here is that you know that the market will move to a large extent, but the direction is unknown.

Consider this – from your research you know that the market will move (direction unknown) hence you have set up the straddle. However the straddle requires you to make an upfront payment of 123.

How would it be if you were to set up a market neutral strategy - similar to the straddle, but at a much lower cost?

Well, the ‘Strangle’ does just that.



## 12.2 – Strategy Notes

The strangle is an improvisation over the straddle. The improvisation mainly helps in terms of reduction of the strategy cost, however as a tradeoff the points required to breakeven increases.

In a straddle you are required to buy call and put options of the ATM strike. However the strangle requires you to buy OTM call and put options. Remember when compared to the ATM strike, the OTM will always trade cheap, therefore this implies setting up a strangle is cheaper than setting up a straddle.

Let's take an example to explain this better –

Nifty is trading at 7921, to set up a strangle we need to buy OTM Call and Put options. Do note, both the options should belong to the same expiry and same underlying. Also the execution should happen in the same ratio (missed this point while discussing straddle).

Same ratio here means – one should buy the same number of call option as that of put option. For instance it can be 1:1 ratio meaning 1 lot of call, 1 lot of put option. Or it can be 5:5, meaning buy 5 lots of call and 5 lots of put option. Something like 2:3 is not considered strangle (or straddle) as in this case you would be buying 2 lots of call options and 3 lots of put options.

Going back to the example, considering Nifty is at 5921, we need to buy OTM Call and Put options. I'd prefer to buy strikes which are 200 points either way (note, there is no particular reason for choosing strikes 200 points away). So this would mean I would buy 7700 Put option and 8100 Call option. These options are trading at 28 and 32 respectively.

The combined premium paid to execute the ‘strangle’ is 60. Let’s figure out how the strategies behave under various scenarios. I’ll keep this discussion brief as I do believe you are now comfortable accessing the P&L across various market scenarios.

### **Scenario 1 – Market expires at 7500 (much below the PE strike)**

At 7500, the premium paid for the call option i.e. 32 will go worthless. However the put option will have an intrinsic value of 200 points. The premium paid for the Put option is 28, hence the total profit from the put option will be  $200 - 28 = +172$

We can further deduct for the premium paid for call option i.e. 32 from the profits of Put option and arrive at the overall profitability i.e.  $172 - 32 = +140$

### **Scenario 2 – Market expires at 7640 (lower breakeven)**

At 7640, the 7700 put option will have an intrinsic value of 60. The put option’s intrinsic value offsets the combined premium paid towards both the call and put option i.e.  $32+28 = 60$ . Hence at 7640, the strangle neither makes money nor losses money.

### **Scenario 3 – Market expires at 7700 (at PE strike)**

At 7700, both the call and put options would expire worthless, hence we would lose the entire premium paid i.e.  $32 + 28 = 60$ . Do note, this also happens to be the maximum loss the strategy would suffer.

### **Scenario 4 – Market expires at 7900, 8100 (ATM and CE strike respectively)**

Both the options expire worthless at 7900 and 8100. Hence we would lose the entire premium paid i.e. 60.

### **Scenarios 5 – Market expires at 8160 (upper breakeven)**

At 8160, the 8100 Call option has an intrinsic value of 60, the gains in the call option would offset the loss incurred against the premium paid towards the call and put options.

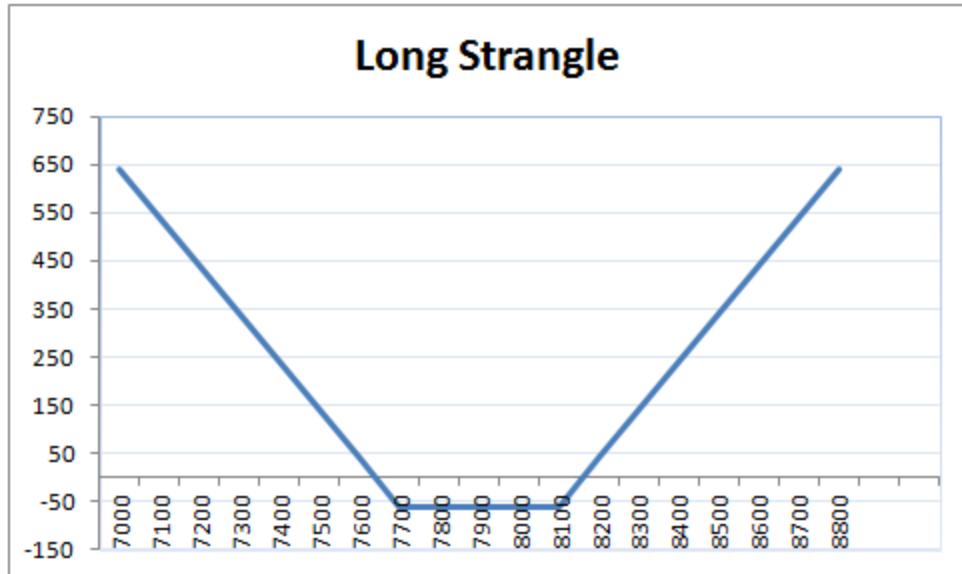
### **Scenarios 6 – Market expires at 8300 (much higher than the CE strike)**

Clearly at 8300, the 8100 call option would have an intrinsic value of 200 points; therefore the option would make 200 points. After adjusting for the combined premium paid of 60 points, we would be left with 140 points profit. Notice the symmetry of payoff above the upper and below the lower breakeven points.

Here is a table which contains various other market expiry scenarios and the eventual payoff at these expiry levels –

| Market Expiry | CE_IV | PP  | CE Payoff | PE_IV | PP  | PE_Payoff | Strategy Payoff |
|---------------|-------|-----|-----------|-------|-----|-----------|-----------------|
| 7000          | 0     | -32 | -32       | 700   | -28 | 672       | 640             |
| 7100          | 0     | -32 | -32       | 600   | -28 | 572       | 540             |
| 7200          | 0     | -32 | -32       | 500   | -28 | 472       | 440             |
| 7300          | 0     | -32 | -32       | 400   | -28 | 372       | 340             |
| 7400          | 0     | -32 | -32       | 300   | -28 | 272       | 240             |
| 7500          | 0     | -32 | -32       | 200   | -28 | 172       | 140             |
| 7600          | 0     | -32 | -32       | 100   | -28 | 72        | 40              |
| 7700          | 0     | -32 | -32       | 0     | -28 | -28       | -60             |
| 7800          | 0     | -32 | -32       | 0     | -28 | -28       | -60             |
| 7900          | 0     | -32 | -32       | 0     | -28 | -28       | -60             |
| 8000          | 0     | -32 | -32       | 0     | -28 | -28       | -60             |
| 8100          | 0     | -32 | -32       | 0     | -28 | -28       | -60             |
| 8200          | 100   | -32 | 68        | 0     | -28 | -28       | 40              |
| 8300          | 200   | -32 | 168       | 0     | -28 | -28       | 140             |
| 8400          | 300   | -32 | 268       | 0     | -28 | -28       | 240             |
| 8500          | 400   | -32 | 368       | 0     | -28 | -28       | 340             |
| 8600          | 500   | -32 | 468       | 0     | -28 | -28       | 440             |
| 8700          | 600   | -32 | 568       | 0     | -28 | -28       | 540             |
| 8800          | 700   | -32 | 668       | 0     | -28 | -28       | 640             |

We can plot the strategy payoff to visualize the payoff diagram of the strangle –



We can generalize a few things about the ‘Strangle’ –

1. The maximum loss is restricted to the net premium paid
2. The loss would be maximum between the two strike prices
3. Upper Breakeven point = CE strike + net premium paid
4. Lower Breakeven point = PE strike – net premium paid
5. Profit potentially is unlimited

So as long as the market moves (irrespective of the direction) the profits are expected to follow.

## 12.3 – Delta and Vega

Both straddles and strangles are similar strategies, therefore the Greeks have a similar effect on strangle and straddles.

Since we are dealing with OTM options (remember we chose strikes that are equidistant from ATM), the delta of both CE and PE would be around 0.3, or lesser. We could add the deltas of each option and get a sense of how the overall position deltas behave.

- 7700 PE Delta @ - 0.3
- 8100 CE Delta @ + 0.3
- Combined delta would be  $-0.3 + 0.3 = 0$

Of course, I've just assumed 0.3 for both the options for convenience; however both the deltas could be slightly different, hence we could not be delta neutral in a strict sense. But then the deltas will certainly not be too high such that it renders a directional bias on the strategy. Anyway, the combined delta indicates that the strategy is directional neutral.

The volatility has similar effect on both straddles and strangles. I'd suggest you refer [Chapter 10, section 10.3](#) to get a sense of how the volatility impacts the strangles.

To summarize the effect of Greeks on strangles -

1. The volatility should be relatively low at the time of strategy execution
2. The volatility should increase during the holding period of the strategy
3. The market should make a large move – the direction of the move does not matter
4. The expected large move is time bound, should happen quickly – well within the expiry
5. Long strangle is to be setup around major events, and the outcome of these events have to be drastically different from the general market expectation

I suppose you understand why long strangles have to be set up around major market events; we have discussed this point earlier as well. If you are confused, I'd request you to read Chapter 10.

## 12.4 – Short Strangle

The execution of a short strangle is the exact opposite of the long strangle. One needs to sell OTM Call and Put options which are equidistant from the ATM strike. In fact you would short the 'strangle' for the exact opposite reasons as to why you go long strangle. I will skip discussing the different expiry scenarios as I assume you are fairly comfortable with establishing the payoff by now.

I've used the same strikes (the one used in long strangle example) for the short strangle example. Instead of buying these options, you would sell these OTM options to set up a short strangle. Here is the payoff table of the short strangle –

| Market Expiry | CE_IV | PP | CE Payoff | PE_IV | PP | PE_Payoff | Strategy Payoff |
|---------------|-------|----|-----------|-------|----|-----------|-----------------|
| 7000          | 0     | 32 | 32        | 700   | 28 | -672      | -640            |
| 7100          | 0     | 32 | 32        | 600   | 28 | -572      | -540            |
| 7200          | 0     | 32 | 32        | 500   | 28 | -472      | -440            |
| 7300          | 0     | 32 | 32        | 400   | 28 | -372      | -340            |
| 7400          | 0     | 32 | 32        | 300   | 28 | -272      | -240            |
| 7500          | 0     | 32 | 32        | 200   | 28 | -172      | -140            |
| 7600          | 0     | 32 | 32        | 100   | 28 | -72       | -40             |
| 7700          | 0     | 32 | 32        | 0     | 28 | 28        | 60              |
| 7800          | 0     | 32 | 32        | 0     | 28 | 28        | 60              |
| 7900          | 0     | 32 | 32        | 0     | 28 | 28        | 60              |
| 8000          | 0     | 32 | 32        | 0     | 28 | 28        | 60              |
| 8100          | 0     | 32 | 32        | 0     | 28 | 28        | 60              |
| 8200          | 100   | 32 | -68       | 0     | 28 | 28        | -40             |
| 8300          | 200   | 32 | -168      | 0     | 28 | 28        | -140            |
| 8400          | 300   | 32 | -268      | 0     | 28 | 28        | -240            |
| 8500          | 400   | 32 | -368      | 0     | 28 | 28        | -340            |
| 8600          | 500   | 32 | -468      | 0     | 28 | 28        | -440            |
| 8700          | 600   | 32 | -568      | 0     | 28 | 28        | -540            |
| 8800          | 700   | 32 | -668      | 0     | 28 | 28        | -640            |

As you can notice, the strategy results in a loss as and when the market moves in any particular direction. However the strategy remains profitable between the lower and upper breakeven points. Recall –

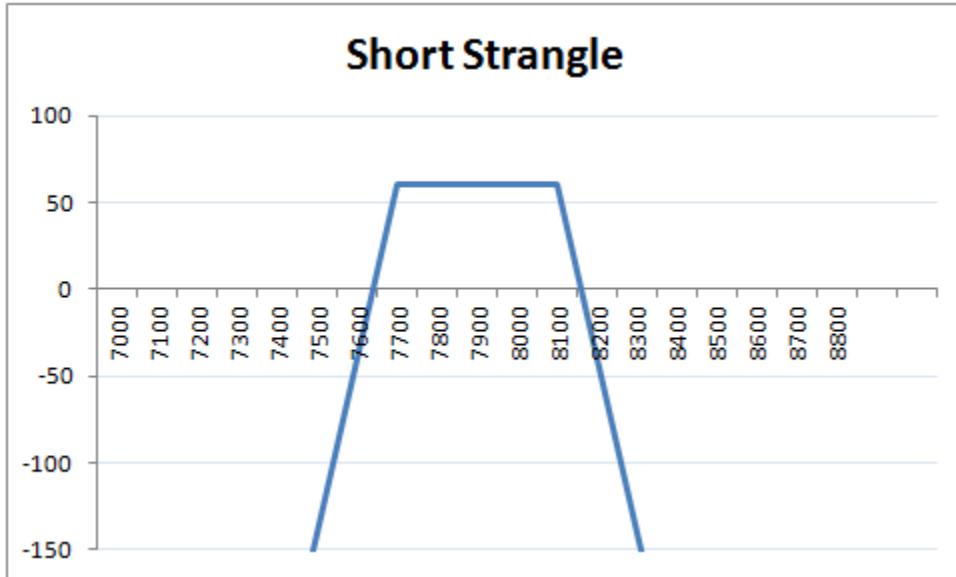
- Upper breakeven point is at 8160
- Lower breakeven point is at 7640
- Max profit is net premium received, which is 60 points

In other words you get to take home 60 points as long as the market stays within 7640 and 8160. In my opinion this is a fantastic proposition. More often than not market stays within certain trading ranges and therefore the market presents such beautiful trading opportunities.

So here is something for you to think about – identify stocks which are in a trading range, typically stocks in a trading range form double/triple tops and bottom. Setup the ‘strangle’ by writing strikes which are outside the upper and lower range. When you write strangles in this backdrop make sure you watch closely for breakouts or breakdowns.

I remember setting up this trade over and over again in Reliance couple of years ago - Reliance was stuck between 850 and 1000 for the longest time.

Anyway, here is the payoff graph of the short strangle –



As you can notice –

1. The payoff of the short strangle looks exactly opposite of the long strangle
2. The profits are restricted to the extent of the net premium received
3. The profits are maximum as long as the stock stays within the two strike prices
4. The losses are potentially unlimited

The breakeven point calculation is the same as the breakeven points of a long strangle, which we have discussed earlier.

You can [download](#) the long and short strangle excel here.

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## Key takeaways from this chapter

1. The strangle is an improvisation over the straddle, the improvisation helps in the strategy cost reduction
2. Strangles are delta neutral and is insulated against any directional risk
3. To set up a long strangle one needs to buy OTM Call and Put option
4. The maximum loss in a long strangle is restricted to the extent of the premium received
5. The profit potential is virtually unlimited in the long strangle

6. The short strangle is the exact opposite of the long strangle. You are required to sell the OTM call and put option in a short strangle
7. The Greeks have the same effect on strangles and straddles

# Max Pain & PCR

## 13.1 – My experience with Option Pain theory

In the never ending list of controversial market theories, the theory of ‘Option Pain’ certainly finds a spot. Option Pain, or sometimes referred to as ‘Max Pain’ has a significant fan following and probably an equal number of people who despise it. I’ll be honest; I’ve been in both camps! In the initial days of following Option Pain, I was never able to make money consistently. However, overtime I found methods to improvise on this theory to suit my own risk appetite, and that yielded a decent result. Later in the chapter I will discuss this as well.

Anyway, now this is my attempt to present you the Option Pain theory and talk to you about what I like and what I don’t about Max Pain. You can take cues from this chapter and decide for yourself which camp you want to be in.

Option Pain theory requires you to be familiar with the concept of **‘Open Interest’**.

So, let’s get started.

## 13.2 – Max Pain Theory

The origins of Option Pain dates back to 2004. So, in a sense, this is still a very young theory. As far as I know there are no academic/scholastic papers on it, which makes one wonder why the academia has ignored this concept.

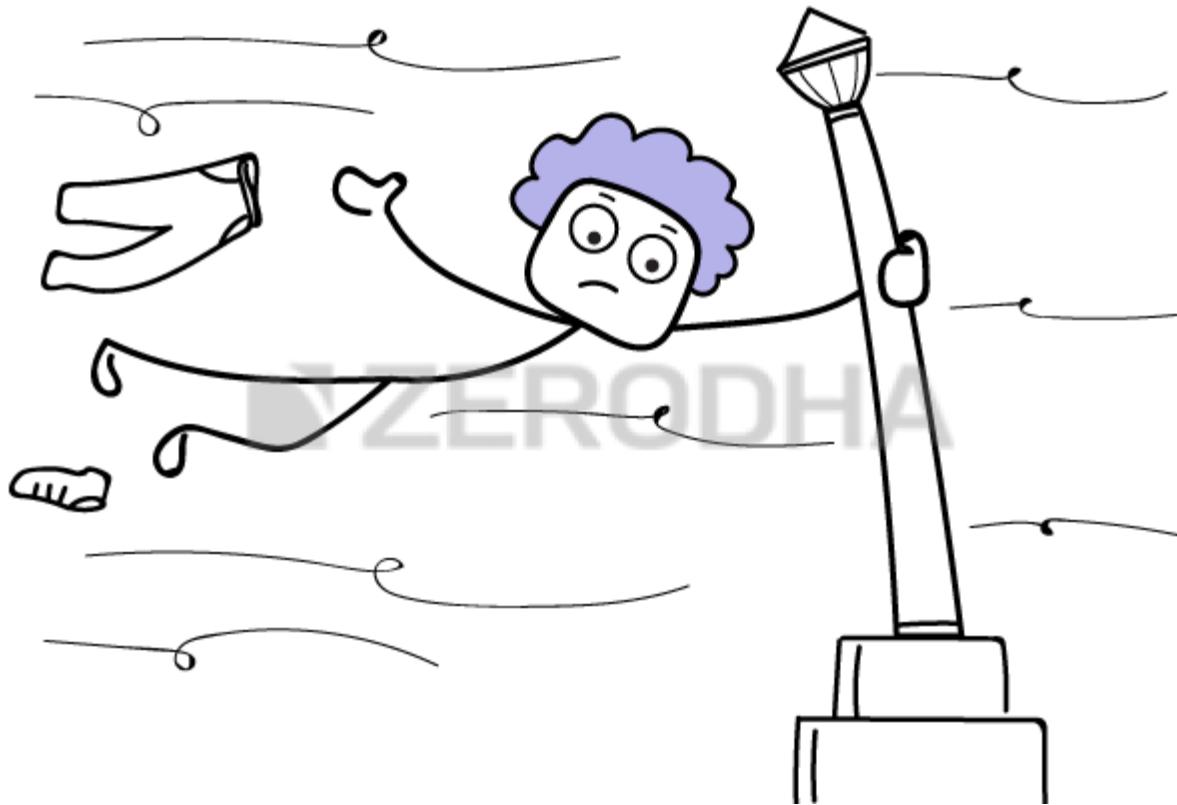
The theory of options pain stems as a corollary to the belief - “90% of the options expire worthless, hence option writers/sellers tend to make money more often, more consistently than the option buyers”.

Now if this statement is true, then we can make a bunch of logical deductions -

1. At any point only one party can make money i.e either the option buyers or option sellers, but not both. From the above statement, it is clear that the sellers are the ones making money.
2. If option sellers tend to make maximum money, then it also means that the price of the option on expiry day should be driven to a point where it would cause least amount of loss to option writers.
3. If point 2 is true, then it further implies that option prices can be manipulated, at least on the day of expiry.
4. If point 3 is true, then it further implies that there exists a group of traders who can manipulate the option prices, at least on the day of expiry.
5. If such a group exists then it must be the option writers/sellers since it is believed that they are the ones who make maximum money/consistently make money trading options.

Now considering all the above points, there must exist a single price point at which, if the market expires, then it would cause least amount of pain to the option writers (or cause maximum amount of pain to option buyers).

If one can identify this price point, then it's most likely that this is the point at which markets will expire. The 'Option Pain' theory does just this – identify the price at which the market is likely to expire considering least amount of pain is caused to option writers.



Here is how optionspain.com formally defines Option Pain – “*In the options market, wealth transfer between option buyers and sellers is a zero sum game. On option expiration days, the underlying stock price often moves toward a point that brings maximum loss to option buyers. This specific price, calculated based on all outstanding options in the markets, is called Option Pain. Option Pain is a proxy for the stock price manipulation target by the option selling group*”.

### 13.3 – Max Pain Calculation

Here is a step by step guide to calculate the Max Pain value. At this stage, you may find this a bit confusing, but I recommend you read through it all the same. Things will get clearer once we take up an example –

**Step 1** – List down the various strikes on the exchange and note down the open interest of both calls and puts for these strikes.

**Step 2** – For each of the strike price that you have noted, assume that the market expires at that strike.

**Step 3** – Calculate how much money is lost by option writers (both call option and put option writers) assuming the market expires as per the assumption in step 2.

**Step 4** – Add up the money lost by call and put option writers.

**Step 5** – Identify the strike at which the money lost by option writers is least.

This level, at which least amount of money is lost by option writers is the point at which maximum pain is caused to option buyers. Therefore this is the price at which the market is most likely to expire.

Let us take up a very simple example to understand this. For the sake of this example, I'll assume there are only 3 Nifty strikes available in the market. I have made a note of the open interest for both call and put options for the respective strike.

| Strike | Call Option OI | Put option OI |
|--------|----------------|---------------|
| 7700   | 1823400        | 5783025       |
| 7800   | 3448575        | 4864125       |
| 7900   | 5367450        | 2559375       |

### **Scenario 1 – Assume markets expires at 7700**

Remember when you write a **Call** option, you will lose money only if the market moves above the strike. Likewise, when you write a **Put** option you will lose money only when the market moves below the strike price.

Therefore if the market expires at 7700, none of the call option writers will lose money. Which means call option writers of 7700, 7800, and 7900 strikes will retain the premiums received.

However, the put option writers will be in trouble. Let's start with the 7900 PE writers –

At 7700 expiry, 7900 PE writers would lose 200 points. Since the OI is 2559375, the Rupee value of loss would be –

$$= 200 * 2559375 = \text{Rs.} 5,11,875,000/-$$

7800 PE writers would lose 100 points, the Rupee value would be

$$= 100 * 4864125 = \text{Rs.}4,864,125,000/-$$

7700 PE writers will not lose any money.

So the combined money lost by option writers if the markets expire at 7700 would be –

Total money lost by Call Option writers + Total money lost by Put Option writers

$$= 0 + \text{Rs.}511875000 + 4,864125000 = \textbf{Rs.}9,98,287,500/-$$

Keep in mind that total money lost by Call Option writers = money lost by 7700 CE writer + money lost by 7800 CE + money lost by 7900 CE

Likewise the Total money lost by Put Option writers = money lost by 7700 PE writer + money lost by 7800 PE + money lost by 7900 PE

### **Scenario 2 – Assume markets expires at 7800**

At 7800, the following call option writers would lose money –

7700 CE writers would lose 100 points, multiplying with its Open Interest we get the Rupee value of the loss.

$$100 * 1823400 = \text{Rs.}1,82,340,000/-$$

Both 7800 CE and 7900 CE seller would not lose money.

The 7700 and 7800 PE seller wouldn't lose money

The 7900 PE would lose 100 points, multiplying with the Open Interest, we get the Rupee value of the loss.

$$100 * 2559375 = \text{Rs.}2,55,937,500/-$$

So the combined loss for Options writers when market expires at 7800 would be –

$$= 182340000 + 255937500$$

$$= \textbf{Rs.}4,38,277,500/-$$

### **Scenario 3 – Assume markets expires at 7900**

At 7900, the following call option writers would lose money –

7700 CE writer would lose 200 points, the Rupee value of this loss would be –

$$200 * 1823400 = \text{Rs.} 3,646,800,000/-$$

7800 CE writer would lose 100 points, the Rupee value of this loss would be –

$$100 * 3448575 = \text{Rs.} 3,44,857,500/-$$

7900 CE writers would retain the premiums received.

Since market expires at 7900, all the put option writers would retain the premiums received.

So therefore the combined loss of option writers would be –

$$= 3646800000 + 344857500 = \text{Rs.} 7,095,375,000/-$$

So at this stage, we have calculated the total Rupee value loss for option writers at every possible expiry level. Let me tabulated the same for you –

| Strike | Call Option OI | Put option OI | Loss value of calls | Loss value of Puts | Total loss |
|--------|----------------|---------------|---------------------|--------------------|------------|
| 7700   | 1823400        | 5783025       | 0                   | 998287500          | 998287500  |
| 7800   | 3448575        | 4864125       | 182340000           | 255937500          | 438277500  |
| 7900   | 5367450        | 2559375       | 7095375000          | 0                  | 7095375000 |

Now that we have identified the combined loss the option writers would experience at various expiry level, we can easily identify the point at which the market is likely to expire.

As per the option pain theory, the market will expire at such a point where there is least amount of pain (read it as least amount of loss) to Option **sellers**.

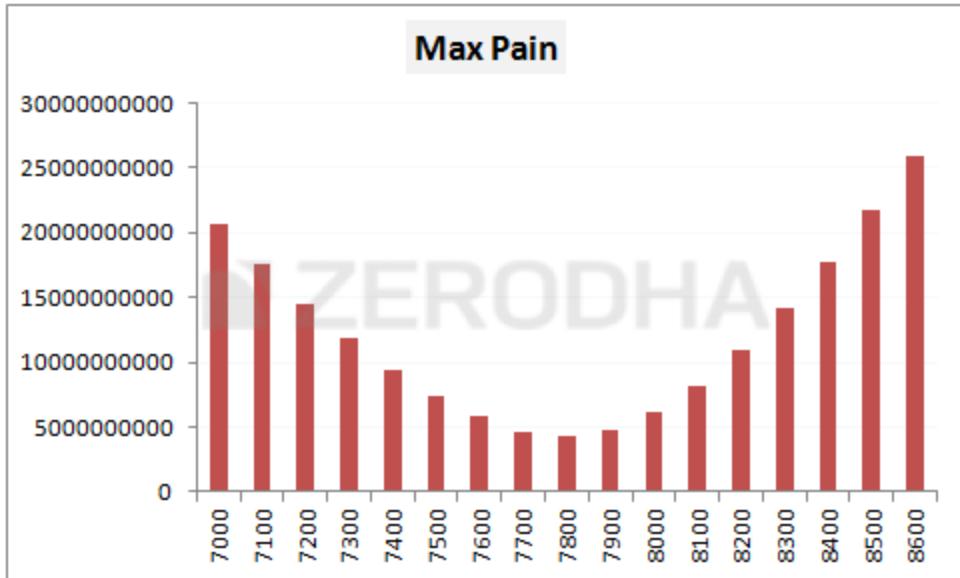
Clearly, from the table above, this point happens to be 7800, where the combined loss is around **438277500** or about 43.82 Crores, which is much lesser compared to the combined loss at 7700 and 7900.

The calculation is as simple as that. However, I've used only 3 strikes in the example for simplicity. But in reality there are many strikes for a given underlying, especially Nifty. Calculations become a bit cumbersome and confusing, hence one would have to resort to a tool like excel.

I've calculated the option pain value as of today (10<sup>th</sup> May 2016) on excel, have a look at the image –

| Strike | Call OI | Put OI  | Cumulative Call | Cumulative Put | Total Value |
|--------|---------|---------|-----------------|----------------|-------------|
| 7000   | 1404300 | 4087050 | 0               | 20691180000    | 20691180000 |
| 7100   | 335700  | 1029150 | 140430000       | 17398192500    | 17538622500 |
| 7200   | 482100  | 2977875 | 314430000       | 14208120000    | 14522550000 |
| 7300   | 422475  | 1975650 | 536640000       | 11315835000    | 11852475000 |
| 7400   | 963900  | 2336700 | 801097500       | 8621115000     | 9422212500  |
| 7500   | 999975  | 4548450 | 1161945000      | 6160065000     | 7322010000  |
| 7600   | 785550  | 3690900 | 1622790000      | 4153860000     | 5776650000  |
| 7700   | 1823400 | 5783025 | 2162190000      | 2516745000     | 4678935000  |
| 7800   | 3448575 | 4864125 | 2883930000      | 1457932500     | 4341862500  |
| 7900   | 5367450 | 2559375 | 3950527500      | 885532500      | 4836060000  |
| 8000   | 6510975 | 1447125 | 5553870000      | 569070000      | 6122940000  |
| 8100   | 5900325 | 310500  | 7808310000      | 397320000      | 8205630000  |
| 8200   | 5113350 | 248775  | 10652782500     | 256620000      | 10909402500 |
| 8300   | 3844500 | 355725  | 14008590000     | 140797500      | 14149387500 |
| 8400   | 2135625 | 255525  | 17748847500     | 60547500       | 17809395000 |
| 8500   | 2252250 | 488475  | 21702667500     | 5850000        | 21708517500 |
| 8600   | 1083750 | 58500   | 25881712500     | 0              | 25881712500 |

For all the available strikes, we assume market would expire at that point and then compute the Rupee value of the loss for CE and PE option writers. This value is shown in the last column titled "Total Value". Once you calculate the total value, we simply have to identify the point at which the least amount of money is lost by the option writer. You can identify this by plotting the 'bar graph' of the total value. The bar graph would look like this –



As you can see, the 7800 strike is the point at which option writers would lose the least amount of money, so as per the option pain theory, 7800 is where the market is likely to expire for the May series.

Now that you have established the expiry level, how can you use this information? Well, there are multiple ways you can use this information.

Most traders use this max pain level to identify the strikes which they can write. In this case, since 7800 is the expected expiry level, one can choose to write call options above 7800 or put options below 7800 and collect all the premiums.

## 13.4 – A Few Modifications

In the initial days, I was very eager to learn about Option Pain. Everything about it made absolute sense. I remember crunching numbers, identifying the expiry level, and writing options to glory. But shockingly the market would expire at some other point leaving me booking a loss and I wondering if I was wrong with my calculations or if the entire theory is flawed!

So I eventually improvised on the classic option pain theory to suit my risk appetite. Here is what I did –

1. The OI values change every day. This means the option pain could suggest 7800 as the expiry level on 10<sup>th</sup> of May and may very well suggest 8000 on 20<sup>th</sup> of May.

I froze on a particular day of the month to run this computation. I preferred doing this when there were 15 days to expiry.

2. I identified the expiry value as per the regular option pain method.
3. I would add a 5% ‘safety buffer’. So at 15 days to expiry, the theory suggest 7800 as expiry, then I’d add a 5% safety buffer. This would make the expiry value as  $7800 + 5\% \text{ of } 7800 = 8190$  or 8200 strike.
4. I would expect the market to expire at any point between 7800 to 8200.
5. I would set up strategies keeping this expiry range in mind, my most favorite being to write call options beyond 8200.
6. I would avoid writing Put option for this simple belief – panic spreads faster than greed. This means markets can fall faster than it can go up.
7. I would hold the options sold up to expiry, and would usually avoid averaging during this period.

The results were much better when I followed this method. Unfortunately, I never tabulated the results, hence I cannot quantify my gains. However if you come from a programming background, you can easily back test this logic and share the results with the rest of community here. Anyway, at a much later stage I realized the 5% buffer was essentially taking to strikes which were approximately 1.5 to 2% standard deviations away, which meant the probability of markets moving beyond the expected expiry level was about 34%.

If you are not sure what this means, I’d suggest you read this chapter on [\*\*standard deviation and distribution of returns\*\*](#).

You can [\*\*download\*\*](#) the Option Pain computation excel.

## **13.5 – The Put Call Ratio**

The Put Call Ratio is a fairly simple ratio to calculate. The ratio helps us identify extreme bullishness or bearishness in the market. PCR is usually considered a contrarian indicator. Meaning, if the PCR indicates extreme bearishness, then we expect the market to reverse, hence the trader turns bullish. Likewise if PCR indicates extreme bullishness, then traders expect markets to reverse and decline.

To calculate PCR, all one needs to do is divide the total open interest of Puts by the total open interest of the Calls. The resulting value usually varies in and around one. Have a look at the image below –

| <b>Strike</b> | <b>Call OI</b>  | <b>Put OI</b>   |
|---------------|-----------------|-----------------|
| 7000          | 1404300         | 4087050         |
| 7100          | 335700          | 1029150         |
| 7200          | 482100          | 2977875         |
| 7300          | 422475          | 1975650         |
| 7400          | 963900          | 2336700         |
| 7500          | 999975          | 4548450         |
| 7600          | 785550          | 3690900         |
| 7700          | 1823400         | 5783025         |
| 7800          | 3448575         | 4864125         |
| 7900          | 5367450         | 2559375         |
| 8000          | 6510975         | 1447125         |
| 8100          | 5900325         | 310500          |
| 8200          | 5113350         | 248775          |
| 8300          | 3844500         | 355725          |
| 8400          | 2135625         | 255525          |
| 8500          | 2252250         | 488475          |
| 8600          | 1083750         | 58500           |
| <b>Total</b>  | <b>42874200</b> | <b>37016925</b> |

As on 10<sup>th</sup> May, the total OI of both Calls and Puts has been calculated. Dividing the Put OI by Call OI gives us the PCR ratio –

$$37016925 / 42874200 = \mathbf{0.863385}$$

The interpretation is as follows –

- If the PCR value is above 1, say 1.3 – then it suggests that there are more Puts being bought compared to Calls. This suggests that the markets have turned extremely bearish, and therefore sort of oversold. One can look for reversals and expect the markets to go up.
- Low PCR values such as 0.5 and below indicates that there are more calls being bought compared to puts. This suggests that the markets have turned extremely bullish, and therefore sort of overbought. Once can look for reversals and expect the markets to go down.

- All values between 0.5 and 1 can be attributed to regular trading activity and can be ignored.

Needless to say, this is a generic approach to PCR. What would really make sense is to historically plot the daily PCR values for say 1 or 2 years and identify these extreme values. For example for Nifty value such as 1.3 can indicate extreme bearishness, but for say Infy something like 1.2 could be extreme bearishness. So you need to be clear about this, hence back testing helps.

You may wonder why the PCR is used as a contrarian indicator. Well, the explanation to this is rather tricky, but the general opinion is this – if the traders are bearish/bullish, then most of them have already taken their respective position (hence a high/low PCR) and therefore there aren't many other players who can come in and drive the positions in the desired direction. Hence the position will eventually be squared off which would drive the stock/index in the opposite direction.

So that's PCR for you. You may come across many variants of this – some prefer to take the total traded value instead of OI, some even prefer to take the volumes. But I personally don't think it is required to over-think PCR.

## **13.6 – Final thoughts**

And with this, I'd like to end this module on Options, which has spread across 2 modules and 36 chapters!

We have discussed close to 15 different option strategies in this module, which I personally think is more than sufficient for retail traders to trade options professionally. Yes, going forward you will encounter many fancy option strategies, perhaps your friend will suggest a fancy option strategy and show off the technicalities of the strategy, but do remember – 'fancy' does not really translate to profit. Some of the best strategies are simple , elegant and easy to implement.

The content we have presented in both, Module 5 and Module 6, is written with an intention of giving you a clear picture on options trading - what is possible to be achieve with options trading and what is not possible. We have thought through and discussed what is required and what isn't. Frankly these two modules are more than sufficient to answer most of your concerns/doubts related to options.

So please do take some time to read through the contents here, at your own pace, and I'm certain you will start trading options the way it is supposed to be done.

Finally, I hope you will enjoy reading this as much as I enjoyed writing this for you.

Good luck and stay profitable!

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## **Key takeaways from this chapter**

1. Option Pain theory assumes that the option writers tend to make more money consistently compared to option buyers.
2. Option pain assumes that option writers can influence the price of options on the day of expiry.
3. One can use the theory of option pain to identify the price at which the stock/index is likely to expiry.
4. The strike at which the option writers would experience least amount of loss is the strike at which the stock/index likely to expire.
5. The PCR is calculated by dividing the total open interest of Puts by the total open interest of the Calls.
6. The PCR is considered as a contrarian indicator.
7. Generally a PCR value of over 1.3 is considered bearish and a PCR value of less than 0.5 is considered bullish.

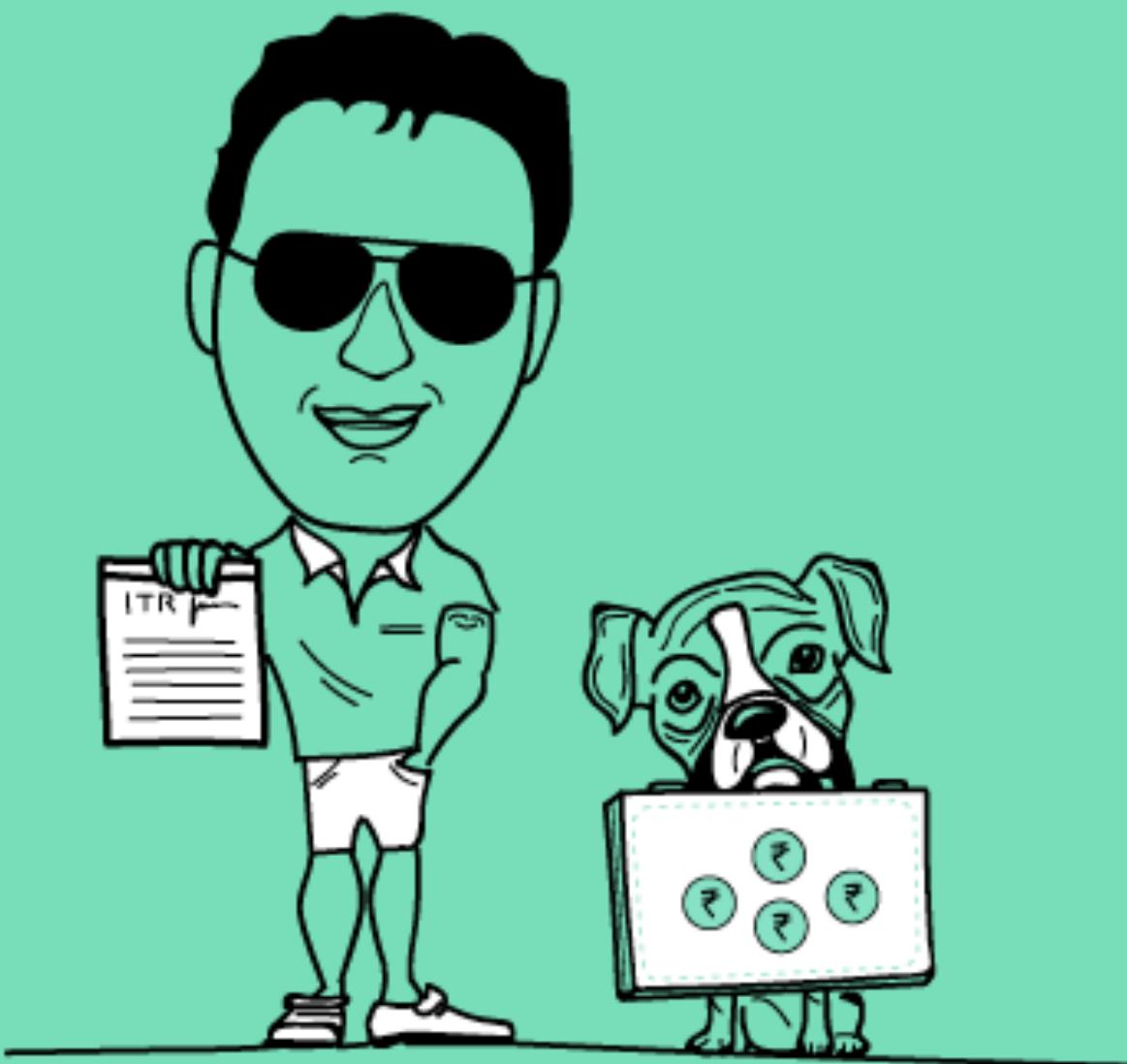
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# Markets and Taxation

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# Introduction(Setting the Context)

I remember a time (maybe about 6 years ago) I had the opportunity to meet one of those hard to find Chartered Accountants who knew both taxation and markets quite well. It was at a friend's party that I got introduced to him. He asked me what I do for a living, to which I promptly replied that I trade for a living. We immediately struck a chord and had a great conversation going. Somewhere during that engaging conversation he asked me a few questions –

- How would I declare my Profits and/or Losses from my market activity?
- Do I bifurcate between speculative business income and non-speculative business income?
- Also, he asked me about the books of accounts that I'm supposed to maintain.

Thanks to my ignorance I had no answers to give him.

I was an eager learner, as I spent all my time learning about the markets and trading strategies but spent very little time learning about taxation and its relevance to market participants.

Probably the reason why I consciously ignored learning about taxation was because I always feared the heavy usage of jargon, random references to sections, subsections, circulars, and whatnot. To my defense – I once did honestly try to learn about taxation. I paid a visit to my broker's office and met my dealer and questioned him on taxation. This is what he had to say – “Arre, why are you so worried? Long-term capital tax is 0% and short-term capital gains tax is 10%, that's it, it is a simple matter.”

I for sure knew it was not just that, I insisted to meet someone more knowledgeable to understand the topic in greater detail. To my luck I got to meet the Regional Head of the stock broking company, enthusiastically I picked his brains about taxation for market participants; unfortunately even he reiterated the same thing that my dealer had told me. It seemed even worse as the regional manager had a sense of pride while he gave me that sloppy answer.

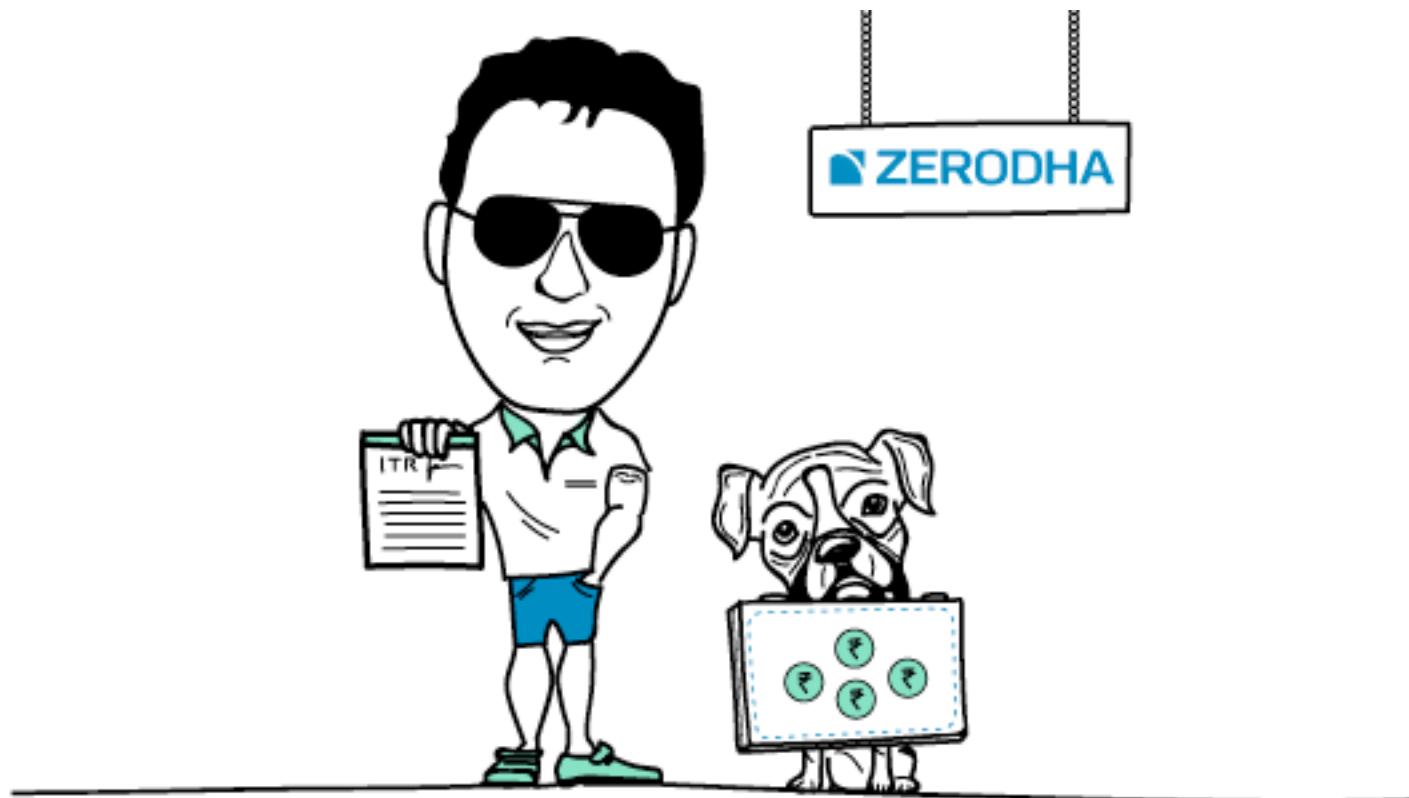
Frustrated, I visited a CA and he essentially said the same thing that my dealer said, but he used fancy jargon and complicated the whole matter to no end. At that point in time nobody had blogged about it online, no good articles were written on the topic and thus my quest to learn taxation related to markets got squashed like a bug.

In retrospect, had I known more about this topic, had I got more information – I would have clearly benefited in multiple ways.

I'm certain there are many traders and investors in a similar situation as I was few years ago. In fact this is true considering that our blog on taxation (which was put up a few years ago) has received over 2000 questions! This number is besides the numerous emails received and queries asked on Trading Q&A.

Keeping this in perspective, we are happy to introduce our new module on Zerodha Varsity aptly titled “Markets & Taxation”. The module deals with literally everything that you need to know about taxation related to markets – be it short term capital gains, or treating your intraday trades as speculative business income, or about Section 44AD – we have it all on Zerodha Varsity – in one place, concise, and simplified.

Now here is the best part – the whole module is authored by Nithin himself, which means that we get to learn about taxation from a trader/investor's perspective and not really from the CA's perspective. This makes a huge difference in terms of topic narrative. With a seasoned trader discussing taxation, we get to learn about the essential topics without digressing into the taxation wilderness.



Lastly, if I look back in time, I could not imagine brokers giving out such valuable information to clients. In fact, stock brokers were always known to hoard information and pass it only to select clients. I'm sure you would agree with me on this, especially if you have been trading the Indian

markets for a while now. Stock Brokers in India have always been snobby, expensive, and full of unwanted attitude.

However the stock broking industry is slowly waking up to the fact that the customer, irrespective of his size deserves the best. This change in attitude is leading to a revolution of sorts in the industry – and I do believe Zerodha is the epicenter of this revolution – changing the way the Indian broking industry functions. Be it providing you high quality tools to trade, better trader education, or ready to use tax friendly reports – Zerodha has it all for you.

So please do go ahead and explore this unique module on Markets & Taxation. I can assure you that the content presented here will make you more confident about matters related to taxation, and with that new-found confidence you will never have to fear the taxman!

Stay connected, stay profitable.

**– Karthik Rangappa**

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# Basics

## 2.1 – Overview

India needs help from all of us countrymen in developing a tax culture. The fear about income tax department can be removed only by gaining knowledge on all the basic rules and regulations. Income tax rates in India have drastically reduced from over 90% in the early seventies to now (2015) where no tax has to be paid on annual income upto Rs 2.5lks. But the apathy of taxpayers towards filing income tax returns and paying taxes continues till today.

With the systems used by the IT department becoming sophisticated every year, the chances of repercussions in terms of notices and penalties due to non-filing, mis-filing, and hiding information while filing your income tax returns (ITR) is going up significantly. Similar to how Income tax (IT) department has access to all your bank account details, they can also check upon all your capital market activity easily through the exchanges as they are all mapped to your PAN (Permanent account number).

Even if the intent is there to be compliant, most people including many Chartered Accountants (CAs) don't understand the subject of taxation when investing & trading very well. We had put up blog post, "**Taxation Simplified**" on Z-Connect a few years back simplifying key aspects of taxation for market participants. Over the last 2 years we have received a few thousand queries on the post. Answering all of them it was obvious that we had to do a lot more to simplify all aspects around taxation while trading or investing in the markets, hence this module.

If you only invest into stocks or mutual funds filing returns is quite simple, but can get tricky if trading intraday stocks or financial derivatives (futures and options).

We will in this module break all the concepts down into small easy to understand chapters without any of those jargons typically used by CA's or tax consultant's. Here is a sneak peak into what you can expect going forward in this module –

- 1. Introduction (Setting the Context)**
- 2. Basics**
- 3. Classify your Market Activity**
- 4. Taxation for Investors**

- 5. Taxation for Traders**
- 6. Turnover, Balance Sheet, and P&L**
- 7. ITR Forms (The Finale)**



## 2.2 – What is income tax?

It is a tax levied by the Government of India on the income of every person. The provisions governing the Income-tax Law are given in the Income-tax Act, 1961. In simpler words, Income Tax is a portion of money that you earn paid to the government of India.

### **Why should I pay tax?**

Yes India does not offer social security and free medical facilities as being provided in some developed countries, but the government needs funds collected as taxes to discharge number of responsibilities like Government hospitals, Education, National defense, Infrastructure development just to name a few.

### **Who is supposed to pay income tax?**

Income-tax is to be paid by every person who earns more than the minimum income slab set by the government. The term ‘person’ as defined under the Income-tax Act covers in its ambit natural as well as artificial persons (including corporate).

Only 2.9 percent of over 121 crore population are taxpayers in India compared to over 45% in a developed economy like U.S.A. Part of the reason for such an abysmally low number is also because many Indians don't earn enough to qualify to pay income tax, but the larger factor has got to do with lack of tax culture.

Taxes have to be paid based on how much income you earn every financial year. Financial year in India starts from April 1st and ends on 31st March. Do note that year can be specified either as financial year (FY) or assessment Year (AY).

FY is used to denote the actual year the income was earned for which you are filing taxes. So FY 2014/15 is the financial year starting April 1st 2014 and ending 31st March 2015.

AY is used to denote the year in which you are supposed to file your taxes. So AY 2015/16 is the year when you file the returns for income earned in FY 2014/15. So AY 2015/16 and FY 2014/15 are one and the same. So you will use ITR with AY 2015/16 on it to file your taxes for the income earned in financial year starting April 1st 2014 and ending 31st March 2015.

## 2.3 – Income tax slabs in India for financial year 2014/15

All Indians have to pay taxes on the total income earned every year as per the below tax slabs they belong to. If you are salaried, your employer would already be paying taxes on your behalf to the government and issuing you a 'Form 16' as an acknowledgement for having paid the taxes. Your employer will not have access to all your sources of income, like bank interest, capital gains, rental income, and others. You are supposed to use the form 16, add all your other income, calculate and pay any additional tax, and file your income tax returns before due date every year. The tax slab for individuals (FY 14/15) is as below –

### Individual (age upto 60 years)

| Income slabs        | Tax Rates  |
|---------------------|--|
| 0 – Rs 2.5 lks      | NIL  |
| Rs 2.5lks – Rs 5lks | 10% of amount by which income exceeds Rs 2.5lks.                 |
| Rs 5lks – Rs 10lks  | Rs. 25,000 + 20% of the amount by which income exceeds Rs 5lks   |
| 10lks and above     | Rs. 125,000 + 30% of the amount by which income exceeds Rs 10lks |

### **Senior citizen (age 60 to 80 years)**

| Income slabs       | Tax Rates  |
|--------------------|--|
| 0 – Rs 3 lks       | NIL  |
| Rs 3lks – Rs 5lks  | 10% of amount by which income exceeds Rs 3lks.                   |
| Rs 5lks – Rs 10lks | Rs. 20,000 + 20% of the amount by which income exceeds Rs 5lks   |
| 10lks and above    | Rs. 120,000 + 30% of the amount by which income exceeds Rs 10lks |

### **Super senior citizen (age 80 years and above)**

| Income slabs       | Tax Rates  |
|--------------------|--|
| 0 – Rs 5 lks       | NIL  |
| Rs 5lks – Rs 10lks | 20% of the amount by which income exceeds Rs 5lks                |
| 10lks and above    | Rs. 100,000 + 30% of the amount by which income exceeds Rs 10lks |

From the next chapter we will start focusing in detail on all aspects of taxation when trading and investing in the markets.

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## Key takeaways from this chapter

1. Filing correct Income tax returns is the duty of every Indian resident
2. The Income tax department has access to your market activity
3. Only 2.9 % of Indians are tax payers
4. Financial year (FY) is the year income was earned, Assessment year (AY) is the year you file your taxes on the income earned
5. Financial year is between 1st of April of the current year and 31st March of the following year
6. The income tax applicable to you depends on the income tax slab you belong to
7. The income tax slabs vary based on your age group

**Disclaimer** – Do consult a chartered accountant (CA) before filing your returns. The content above is for your general knowledge only. Content meant for Individual retail investors/traders in India.

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# Classifying Your Market Activity

## 3.1 – Are you a trader or investor or both?

Identifying yourself as a trader or an investor is the first step to file your income tax returns. This may seem like an easy task, but here is what this **circular from CBDT** (Central board of direct taxes) says:

“If you buy shares with the intent of earning income through dividends you are an investor, and if you buy and sell shares with the intent to profit, you are a trader”:) .

Yes, that is how vague it is, and this is a circular dated 2007, released after 18 years of the original circular. Numerous judicial pronouncements and government was still unable to clear this highly debatable issue. Thanks to the vagueness of this circular, it has given too much power in the hands of the assessing Income tax officer (AO) especially considering the fact that most of the stock purchases are done intending to profit from the price appreciation.

So before filing income tax returns, you will have to first classify yourself as an investor, trader, or both. We will in this chapter help you figure this out in line with what most AO's would be expecting. By income I mean **both** profits and losses.

When trading or investing you need to classify your income under one of these heads, broadly speaking they are –

- 1.** Long term capital gain (LTCG)
- 2.** Short term capital gain (STCG)
- 3.** Speculative business income
- 4.** Non-speculative business income

Let us understand what each of these mean.

### **Long term capital (LTCG)**

Assume you buy stocks or Mutual Funds today for Rs.50,000/- and sell the same after 365 days at Rs.55,000/-, then the profit or gain of Rs.5,000/- is considered as Long term capital gain. Generally speaking, gain or profit earned by investing into stocks or equity mutual funds, and selling after 1 year from date of purchase can be categorized under LTCG. Currently in India any gains realized and categorized as LTCG (equity & equity MF) is completely exempt from taxes. In other words, tax on LTCG is at 0%. Do note – the purchase and sale of shares has to be conducted via a recognized exchange.

Just to reemphasize – if you had bought Infosys shares worth Rs.1,00,000/- 10 years ago, and sold the same today for Rs 1 crore, you don't have to pay any taxes on your gain or profit of Rs 99,00,000.

So, taxes on long term capital gain of Rs 99,00,000 = 0 (Zero) or exempt

If the investment and the consequent sale were done via an off-market transaction,

- ➡ Non listed stocks – Tax on LTCG is 20% (for example purchase and sale of shares belonging to startup companies by Venture Capitalists)
- ➡ Listed stocks – Tax on LTCG 10%

### **Short term gain (STCG)**

Assume you buy stocks or Mutual Funds today for Rs.50,000/- and sell the same within the completion of 365 days, say at Rs.55,000/-, then the profit or gain of Rs.5,000/- is considered as a Short term capital gain(STCG) .

Generally speaking, gain or profit earned by investing into stocks or equity mutual funds holding for more than 1 day (also called delivery based) and selling them within 1 year from date of purchase can be categorized under STCG.

Currently tax on STCG in India is flat 15% on the gain or profit.

Therefore, if you buy Infosys shares worth Rs 100,000/- today and sell the same 10 days later for Rs.120,000/-, then you are liable to pay 15% on Rs 20,000 (STCG) or Rs 3000/- as taxes.

So, tax on short term capital gain = flat 15% of the gain/profit.

## Speculative Business income

As per section 43(5) of the Income Tax Act, 1961, profits earned by trading equity or stocks for intraday or non-delivery is categorized under speculative **business income**.

There is no fixed rate like capital gains tax rate when you have a business income. If you have a business income, it has to be added to the rest of your other income and tax has to be paid as per the tax slab you fall in.

For example, assume for the financial year my profit from trading intraday stocks was Rs. 100,000/-, and my salary for the year was Rs.400,000/-. So my total income for the year is Rs 5,00,000, and I have to pay taxes on this as per my tax slab, Rs 25000 in this case as shown below.

| SL No.                      | Slab                | Taxable Amount | Tax Rate | Tax Amount        |
|-----------------------------|---------------------|----------------|----------|-------------------|
| 1                           | 0 to Rs.250,000     | 2,50,000       | 0%       | Nil               |
| 2                           | 250,000 to 5,00,000 | 2,50,000       | 10%      | 25000             |
| <b>Total Tax applicable</b> |                     |                |          | <b>Rs. 25,000</b> |

So the point here is that, one needs to club the speculative business income with other income source and identify the taxable amount. Once this is done, tax has to be paid based on the tax slab one belongs to.

## Non – speculative Business income

Income from trading futures & options on recognized exchanges (equity, commodity, & currency) is categorized under non-speculative business income as per section 43(5) of the Income Tax Act, 1961.

Like discussed earlier, business income has no fixed tax rate, you are required to add the non-speculative business income to all your other income, and pay taxes according to the slab applicable to you.

For example, assume a trader cum hotelier earns Rs, 500,000 by trading F&O. Besides this assume he also earns Rs.20,00,000/- from his hotel business. Therefore his total income for the year is Rs 25,00,000/- (Rs.500,000 + Rs.20,00,000) and therefore his tax obligation is as follows

| SL No.                      | Slab                   | Taxable Amount | Tax Rate | Tax Amount        |
|-----------------------------|------------------------|----------------|----------|-------------------|
| 1                           | 0 to Rs.250,000        | 2,50,000       | 0%       | Nil               |
| 2                           | 250,000 to 5,00,000    | 2,50,000       | 10%      | 25000             |
| 3                           | 500,000 to 1,000,000   | 5,00,000       | 20%      | 1,00,000          |
| 4                           | 10,00,000 to 25,00,000 | 15,00,000      | 30%      | 4,50,000          |
| <b>Total Tax applicable</b> |                        |                |          | <b>Rs.575,000</b> |

Effectively the business man here is paying 30% of his F&O profits as taxes.

You would be wondering why trading equity intraday is considered ‘speculative’ but trading F&O is considered ‘non speculative’?

When trading intraday there is no intention of taking delivery, and hence it is considered speculative business. F&O is defined as non-speculative by the government, maybe as they can be used for hedging and also for taking/giving delivery of the underlying contract (even though currently equity and currency derivatives in India are all cash settled, but by definition they give rise to giving/taking delivery. Certain commodity F&O contracts like gold have delivery option to it).

### 3.2 – Pros and cons of declaring trading as a business income

Let us look at the bright side first; here is a list of advantages of declaring trading as a business income

- 1. Low tax** – If the total income (trading + any other) is less than Rs.250,000/-, then there is no tax implication and if less than Rs.500,000/- effectively one has to pay less than 10% of income as tax.
- 2. Claim expense** – One can claim benefit of all expenses incurred for the business of trading (while for capital gains only charges on your contract note other than STT can be claimed). For example, brokerage charges, STT, other statutory taxes while trading, internet, phone, newspapers, depreciation of computers and electronics, research reports, books, advisory, etc.
- 3. Offset the loss with gains** – If one incurs any non-speculative F&O trading loss, this can be set-off against any income other than salary. For example, if I incur Rs 5,00,000 loss in trading F&O and my other income (like rent & interest, excluding salary) is Rs 10,00,000 , I will have to now pay tax only on Rs 5,00,000.

**4. Carry forward the F&O loss** – If there is net loss any year (non-speculative F&O + any income other than salary), and if income tax returns are filed before due date, loss can be carried forward for the next 8 years. During the next 8 years, this loss can be set-off against any other business gain (non-speculative business income). For example, if you had net loss of Rs 5,00,000 this year trading F&O which was declared on time, you can carry forward this loss next year and assuming you made a profit of Rs 20,00,000 next year, you can set-off the previous year's Rs 5,00,000 loss and pay taxes only on Rs 15,00,000.

**5. Carry forward your intraday equity loss** – Any speculative or intraday equity trading loss can be set-off only against any other speculative gain (note: you cannot set-off intraday equity trading loss which is considered speculative with F&O trading which is considered non-speculative). Speculative losses can be carried forward for 4 years if the returns are filed on time. So assume an equity intraday trader makes a loss of Rs.100,000/- this year, he cannot offset this against any other business income. However, he can carry it forward to the next year (upto 4 years). Assume the next year he makes a profit of Rs.50,000/- by trading equity intraday, then in that case he can use the previous year's Rs.100,000/- loss to offset the complete gains of this year (Rs.50,000). The balance loss of Rs.50,000/- can still be carried forward to the next 3 years. So do note, partial offset of losses is possible.

The following table summarizes the above points –

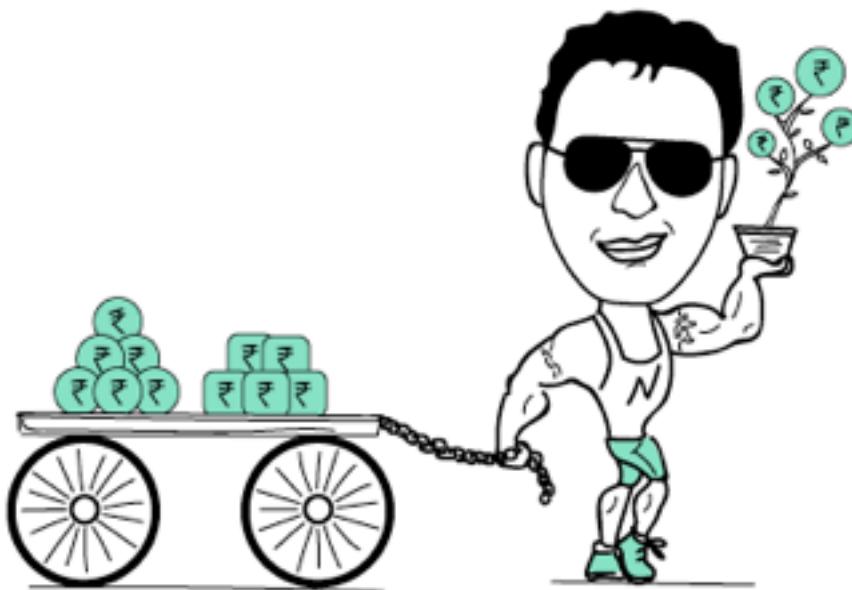
| Head of income under which Loss is incurred | Whether loss can be set- off within the same year |                      | Whether Losses can be carried forward and set-off in subsequent years |                      | Time limit for carry forward and set-off of losses |
|---|---|----------------------|---|----------------------|--|
|   | Under the same head                               | Under any other Head | Under the same head   | Under any other Head |  |
| Losses of F&O as a Trader                   | Yes   | Yes                  | Yes   | No                   | 8 years  |
| Speculation Business                        | Yes   | No                   | Yes   | No                   | 4 years  |
| Capital Gain (Short-Term)                   | Yes   | No                   | Yes   | No                   | 8 years  |

Now, here is a set of drawbacks for declaring your business income –

**1. Potentially high taxes** – If you fall under the 30% tax slab, you will effectively pay 30% of all your trading profits as taxes

**2. ITR Forms** – Declaring business income would mean having to use an ITR4 or 4S, which would mean needing help of a CA to file your IT returns. This can be an added effort and cost especially for those salaried people who might have been using the very easy ITR 1 or ITR 2 (we will discuss more on this topic in the chapter on ITR forms)

**3. Audit** – Having to maintain the book of accounts which will need to be audited if your turnover goes above Rs 1 crore for a year or if your profit is less than 8% of your turnover (we will discuss more on this topic in the chapter on Turnover)



### 3.3 – What are you? Trader, Investor, or Both?

Coming back to our original discussion, according to CBDT

Investor: anyone who invests with the intention of earning through dividends

Trader: anyone who buys and sells with the intention of profiting from the price rise.

As an investor, you can claim all your delivery based equity gains/profit to be capital gains. But as a trader, it becomes your business income which has its own pros and cons as discussed above.

The rule is very clear with **respect to F&O trading, and intraday equity trading**. F&O trading has to be considered as a non-speculative business, and intraday equity as a speculative business. So if you trade these instruments, you have to use ITR 4 for filing IT returns. So even if you are salaried, you have to compulsorily use ITR4 and declare this income (profit or loss) from trading as a business.

Unlike what most people think, losses also have to be **declared compulsorily**. Hiding trading activity on the exchange from the IT department could mean trouble, especially in case of any IT scrutiny (IT scrutiny is when the assessing income tax officer (AO) demands you to meet him and give an explanation on your IT returns). The chances of getting a call for scrutiny is higher when the IT department systems/algorithms pick up trading activity on your PAN, but the same not declared on your ITR.

For **equity delivery based investments**, if you are holding stocks for more than a year, you would have received some kind of dividend and even if you didn't, you can show them all as investments and claim exemption under the long term capital gain. If you are **buying and selling stocks frequently** (yes it is an open statement, but there is no rule which quantifies 'frequent') for shorter terms, it is best to declare that as non-speculative business income instead of STCG.

Another thing to keep in mind is that if investing/trading on the markets is your only source of income, and even if your trading activity is moderate, it is best to classify income from all your equity trades as a business income instead of capital gains. On the other hand, if you are salaried or have some other business as your primary source of business, it becomes easier to show your equity trades as capital gains even if the frequency is slightly higher.

Thankfully one thing **that the circular** clarified was that you can be a trader and investor both at the same time. So you can have stocks meant as investment for long term, and stocks meant for shorter term trades. Just because you indulge in a lot of shorter term trades, wouldn't necessarily convert all your longer term holdings or investments into trades and therefore bring those long term gains under business income. But it is important to clearly demarcate your trading and investment portfolio while filing returns.

Similarly, if you are trading F&O or intraday equity trading, you compulsorily have to classify yourself as a trader, but you can still show your long term investments under the capital gains head to get the benefit of LTCG being exempt from taxes.

So, you can be an investor, trader, or both, but make sure to keep the above points in mind, and **do consult a chartered accountant before filing returns.**

Even though this might seem confusing, rules are made for 1% of the population that is trying to break them. As long as your intent is right, you know the basic concerns of the IT department and keep those in mind while filing IT returns, it is quite simple. But stay consistent with the way you classify yourself, don't keep switching between being an investor or trader to declare your equity short term trades.

If you follow these simple rules, let me assure you – there is no need to fear the taxman.

Before we wrap this chapter, here are some interesting links that you should read through.

[CBDT circular on distinction between trades and investments.](#)

[Business Standard – Is your return from stocks capital gains or business income?](#)

[Economic Times – Are you a stock trader or an investor?](#)

[Taxguru – Income from share trading – Business or capital gain?](#)

[Moneycontrol- Investor or trader: The argument continues](#)

[Economic Times – Budget 2014 clarifies that commodity trading on recognized exchanges is non-speculative](#)

[Economic times – New data mining tool may access PAN-based information of taxpayers, help check evasion](#)

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## Key takeaways from this chapter

1. Trading F&O (Equity, currency, commodity) is considered non-speculative business
2. Trading intraday equity is considered speculative business
3. Equity holdings for more than 1 year is considered Long term capital gain (LTCG)
4. Equity holdings between 1 day to 1 year with low frequency of trades is considered Short term capital gain (STCG), else in case of high frequency of trades it should be considered as non-speculative business income

**Disclaimer** – Do consult a chartered accountant (CA) before filing your returns. The content above is in the context of taxation for retail individual investors/traders only.

# Taxation for Investors

## 4.1 – Quick recap

In continuation of previous chapter: **Classifying your market activity**

You can consider yourself an **investor** when –

- Buying and selling stocks after taking delivery to your DEMAT account not frequently or
- Equity holdings were purchased with an idea to earn dividends or with a plan of holding it for long term.

If the frequency of transactions (buy/sells) is high, it is best to consider them as trades and not investments. If considered as trades, any income is **non-speculative business income**, whereas if these are investments, then it falls under **capital gains**.

Keeping this in perspective, you may have few questions –

- What is long term?
- What is considered high frequency of transactions (buy/sells)?

We discussed this in the previous chapter, but just to refresh your memory – there is no set rule from the IT department to quantify ‘frequency’ or determine ‘long term’.

As long as your intent is right, and you are consistent across financial years in the way you identify long term or high frequency, there is nothing to worry.

Do note, if you are indulging in equity delivery based trades as frequent as a **few times every week**, it would be best to consider all of them as ‘trades’ and classifying income from them as business income instead of capital gains.

Reiterating again that if investing/trading on the markets is the only source of income, and even if you are trading with moderate frequency, it is best to classify income from all your equity trades as a business income instead of capital gains.

On the other hand, if you are salaried or have some other business as your primary source of business, it becomes easier to show your equity trades as capital gains even if the frequency of trades is slightly higher.

So essentially,

1. Stocks that you hold for more than 1 year can be considered as investments as you would have most likely received some dividends and also held for longish time
2. Shorter term equity delivery buy/sells can be considered as investments as long as frequency of such buy/sells is low
3. Shorter term equity delivery buy/sells ideally has to be considered as trades (trading/business income) if your frequency of such trades is as high as few times every week

The focus of this chapter is on investing; hence we will keep the discussion limited to just points 1 and 2. We will talk about taxation when trading/business income in the next chapter.

## 4.2 – Long term capital gain (LTCG)

When you buy & sell (long trades) or sell & buy (short trades) stocks within a single trading day then such transactions are called intraday equity/stock trades.

Alternatively if you are buying stocks/equity and wait till it gets delivered to your DEMAT account before selling it, then it is called ‘equity delivery based’ transactions.

Any gain or profit earned through equity delivery based trades or mutual funds can be categorized under capital gains, which can be subdivided into:

- **Long term capital gain (LTCG):** equity delivery based investments where the holding period is more than 1 year
- **Short term capital gain (STCG):** equity delivery based investments where the holding period is lesser than 1 year

Taxes on long term capital gains for equity and mutual funds are discussed below –

### For stocks/equity – 0% or NIL tax

It is NIL only if the transactions (buy/sells) are executed on recognized stock exchanges where STT (Security transaction tax) is paid. As discussed above, LTCG is for holding period more than 1 year.

If the transactions (buy/sells) are executed through off-market transfer where shares are transferred from one person to another via delivery instruction booklet and not via a recognized exchange then LTCG is 20% in case of non-listed stocks, and 10% on listed stocks. (Listed are those which trade on recognized exchanges). Do note that when you carry an off-market transaction Security Transaction Tax (STT) is not paid, but you end up paying higher capital gains tax. A typical

example of an off-market transaction could be a father transferring equity holdings to his son via a ‘delivery instruction booklet’.

### **For equity mutual funds (MF) – 0% or NIL tax**

Similar to equity delivery based trades, any gain in investment in equity oriented mutual funds for more than 1 year is considered as LTCG and exempt from taxes. A mutual fund is considered as equity oriented if at least 65% of the investible funds are deployed into equity or shares of domestic companies.

### **For non-equity oriented/Debt MF – flat 20% on the gain with indexation benefit**

Union budget 2014 brought in a major change to non-equity mutual funds. As opposed to 1 year in equity based funds, you have to stay invested for 3 years in non-equity/debt funds for the investment to be considered as long term capital gain. If you sell the funds within 3 years to realize a gain, then that gain is considered as STCG.

## **4.3 – Indexation**

When calculating capital gains in case of non-equity oriented mutual funds, property, gold, and others where you are taxed on LTCG, you get the indexation benefit to determine your **net capital gain**.

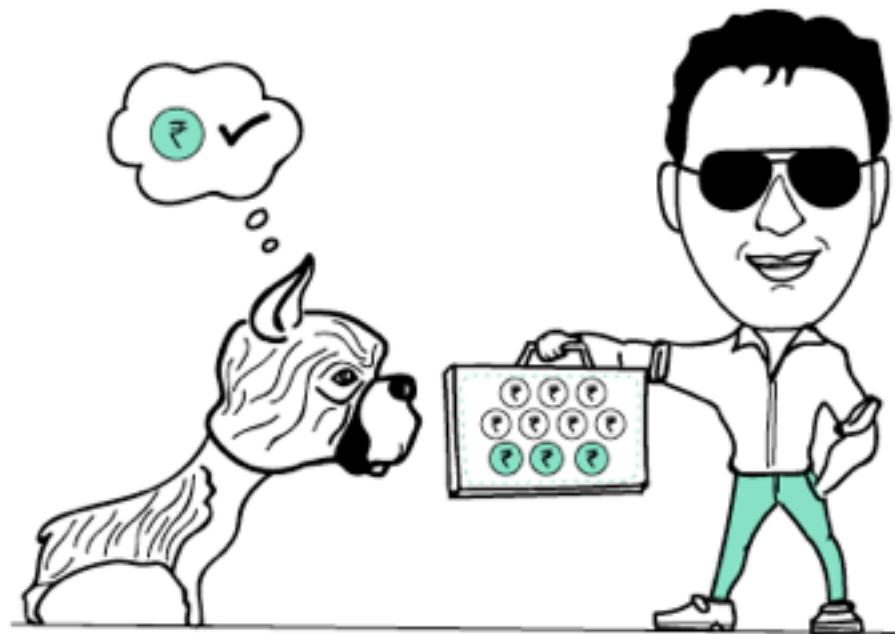
I guess we would all agree that inflation eats into most of what is earned as profits by investing into capital assets such as the ones mentioned above.

For someone wondering what that inflation is, here is a simple example to help you understand the same –

All else equal, if a box of sweets priced at Rs.100 last year, chances are the same could cost Rs.110 this year. The price differential is attributable to Inflation, which in this example is 10%. Inflation is the % by which purchasing value of your money diminishes.

Assuming the average inflation rate in India of around 6.5%, if you had invested into a debt fund, wouldn’t a big portion of your long term capital gain at the end of 3 years get eaten away by inflation?

For example assume you had invested Rs.100,000/- into a debt fund, and you got back Rs 130,000/- at the end of 3 years. You have a long term capital gain of Rs.30,000/-. But in the same period assume purchasing value of money is dropped by 18k because of inflation. Should you still pay long term capital gain on the entire 30k? Clearly this does not make sense right?



Indexation is a simple method to determine the true value from sale of an **asset after considering the effect of inflation**. This can be done with help of **Cost inflation index (CII)** which can be found on the [income tax website](#).

Let me explain this with an example of a purchase/sale of a debt mutual fund.

Purchase value: Rs.100,000/-

Year of purchase: 2005

Sale value: Rs 300,000

Year of sale: 2015

Long term capital gain: Rs 200,000/-

Without indexation I would have to pay tax of 20% on the capital gains of Rs 200,000/-, which works out to Rs 40,000/-.

But we can reduce the LTCG by considering indexation.

To calculate indexed purchase value, we need to use the cost inflation index (CII). Find below the cost inflation index from the income tax website until 2014/15.

| <b>Financial Year</b> | <b>CII</b> |
|-----------------------|------------|
| Before 1/4/1981       | 100        |
| 1981-82               | 100        |
| 1982-83               | 109        |
| 1983-84               | 116        |
| 1984-85               | 125        |
| 1985-86               | 133        |
| 1986-87               | 140        |
| 1987-88               | 150        |
| 1988-89               | 161        |
| 1989-90               | 172        |
| 1990-91               | 182        |
| 1991-92               | 199        |
| 1992-93               | 223        |
| 1993-94               | 244        |
| 1994-95               | 259        |
| 1995-96               | 281        |
| 1996-97               | 305        |
| 1997-98               | 331        |
| 1998-99               | 351        |
| 1999-00               | 389        |
| 2000-01               | 406        |
| 2001-02               | 426        |

| <b>Financial Year</b> | <b>CII</b> |
|-----------------------|------------|
| 2002-03               | 447        |
| 2003-04               | 463        |
| 2004-05               | 480        |
| 2005-06               | 497        |
| 2006-07               | 519        |
| 2007-08               | 551        |
| 2008-09               | 582        |
| 2009-10               | 632        |
| 2010-11               | 711        |
| 2011-12               | 785        |
| 2012-13               | 852        |
| 2013-14               | 939        |
| 2014-15               | 1024       |

Going back to the above example,

CII in the year of purchase (2005): 497

CII in the year of sale (2015): 1024

**Indexed purchase value = Purchase value \* (CII for year of sale/ CII for year of purchase)**

So –

Indexed purchase value = Rs 100000 \* (1024/497)

= Rs 206036

**Long term capital gain = Sale value - Indexed purchase value**

Therefore, in our example

$$\text{LTCG} = \text{Rs } 300,000 - \text{Rs } 206,036$$

$$= \text{Rs } 93,964/-$$

So the tax now would be 20% of Rs 93,964 = Rs 18,792, much lesser than Rs 40,000/- you would have had to pay without the indexation benefit.

Like I had said earlier, the indexed purchase value can be calculated using the above method for all long term capital gains which are taxable like debt funds, real estate, gold, FD, among others. You could use the IT department's **Cost inflation index utility** to check on indexed purchase value of your capital assets instead of having to calculate manually.

Interesting thing to note in regards to 20% after indexation for non-equity oriented or debt funds: Most of these funds return between 8 to 10% and typically inflation in India has been around that for the last many years. So with the indexation benefit, you typically won't have to pay any tax on LTCG of non-equity oriented funds.

## 4.4 – Short term capital gain (STCG)

**Tax on short** term capital gains for equity and mutual funds are discussed below –

### **For stocks/equity: 15% of the gain**

It is 15% of the gain if the transactions (buy/sells) are executed on recognized stock exchanges where STT (Security transaction tax) is paid. STCG is applicable for holding period less than 1 year (365 days) and more than 1 day.

If the transactions (buy/sells) are executed via off-market transfer (where shares are transferred from one person to another via delivery instruction booklet and not on the exchange) where STT is not paid, STCG will be taxable as per your applicable tax slab rate. For example, if you are earning over Rs.10,00,000/- per year in salary, you will fall in the 30% slab, and hence STCG will also be taxed at 30%.

### **For equity mutual funds (MF): 15% of the gain**

Similar to STCG for equity delivery based trades, any gain in investment in equity oriented mutual funds held for lesser than 1 year is considered as STCG and taxed at 15% of the gain. Do note a fund is considered Equity based if 65% of the funds are invested in domestic companies.

## For non-equity oriented/Debt MF: As per your individual tax slab

Union budget 2014 brought in a major change to non-equity mutual funds. You have to now stay invested for 3 years for the investment to be considered as long term capital gain. All gains made on investments in such funds held for less than 3 years are now considered as STCG. STCG in this case has to be added to your other business income and tax paid according to your income tax slab.

For example, if you are earning around Rs 800,000/- per year in your normal business/salary and you had STCG of Rs 100,000/- from debt funds, you will fall in the 20% slab as your total income is Rs 9,00,000/-. So effectively in this example you will pay 20% of STCG as taxes.

## 4.5 – Days of holding

For an investor, the taxation difference between LTCG and STCG is quite huge. If you sold stocks 360 days from when you had bought, you would have to pay 15% of all gains as taxes on STCG. The same stock if held for 5 days more (1 year or 365 days), the entire gain would be exempt from taxation as it would be LTCG now.

It becomes imperative that you as an investor keep a tab on the number of days since you purchased your stock holdings. If you have purchased the same stock multiple times during the holding period, then the period will be determined using FIFO (First in First out) method.

Let me explain –

Assume on 10th April 2014, you bought 100 shares of Reliance at Rs.800 per share, and on June 1st 2014 another 100 shares were bought at Rs.820 per share.

A year later, on May 1st 2015, you sold 150 shares at 920.

Following FIFO guidelines, 100 shares bought on 10th April 2014 and 50 shares from the 100 bought on June 1st 2014 should be considered as being sold.

Hence, for shares bought on 10th April 2014 gains = Rs 120 (920-800) x 100 = Rs 12,000/- (LTCG and hence 0 tax).

For shares bought on June 1st, Gain = Rs 100 (920-820) x 50 = Rs 5,000/- (STCG and hence 15% tax).

Small little sales pitch here – if you are trading at Zerodha the holdings page in our back office assistant Q will keep a tab for you on number of days since your holdings were purchased, and even a breakdown if bought in multiple trades.

Here is a snapshot of the same –

|    |            |              |            |         |            |         |            |   |
|----|------------|--------------|------------|---------|------------|---------|------------|---|
| 12 | BHEL       | INE257A01026 | 35         | ₹276.90 | ₹9,691.50  | ₹230.95 | ₹8,083.25  | ₹-1,608.25 (-16.59%)  |
|    | Symbol     |              | Date       |         | Qty        |         | Days       |   |
|    | BHEL       |              | 24-02-2015 |         | 35         |         | 63         | 1    |
|    |            |              |            |         |            |         |            | signifies long term holding.  |
| 13 | HINDUNILVR | INE030A01027 | 25         | ₹470.50 | ₹11,762.50 | ₹045.15 | ₹11,120.75 | ₹9,366.25 (79.63%)  |
|    | Symbol     |              | Date       |         | Qty        |         | Days       |   |
|    | HINDUNILVR |              | 26-03-2013 |         | 25         |         | 783        | 2    |
|    |            |              |            |         |            |         |            | signifies long term holding.  |
| 14 | ACROPETAL  | INE055L01013 | 1          | ₹5.45   | ₹5.45      | ₹3.00   | ₹3.00      | ₹-2.45 (-44.95%)  |
| 15 | WONDERLA   | INE066O01014 | 84         | ₹283.60 | ₹23,822.40 | ₹270.55 | ₹22,726.20 | ₹-1,096.20 (-4.6%)  |
|    | Symbol     |              | Date       |         | Qty        |         | Days       |   |
|    | WONDERLA   |              | 06-05-2015 |         | 4          |         | 12         | 3  |
|    |            |              | 12-03-2015 |         | 80         |         | 67         |   |
|    |            |              |            |         |            |         |            | signifies long term holding.  |

The highlights shows –

1. Day counter
2. A green arrow signifying holdings more than 365 days, selling which won't attract any taxes.
3. If you have bought the same holdings in multiple trades, the split up showing the same.

Besides Zerodha Q, equity tax P&L is probably the only report offered by an Indian brokerage which gives you a complete breakdown of speculative income, STCG and LTCG.

## 4.6 – Quick note on STT, Advance Tax, and more

STT (Securities Transaction Tax) is a tax payable to the government of India on trades executed on recognized stock exchanges. The tax is not applicable on off-market transactions which is when shares are transferred from one DEMAT to another through delivery instruction slips instead of routing the trades via exchange. But off market transactions attracts higher capital gains

tax as explained previously. Current rate of STT for equity delivery based trades is 0.1% of the trade value.

When calculating taxes on capital gains, STT can't be added to the cost of acquisition or sale of shares/stocks/equity. Whereas brokerage and all other charges (which includes exchange charges, SEBI charges, stamp duty, service tax) that you pay when buying/selling shares on the exchange can be added to the cost of share, hence indirectly taking benefit of these expenses that you incur.

### **Advance tax when you have realized capital gains (STCG)**

Every tax payer with business income or with realized (profit booked) short term capital gains is required to pay advance tax on 15th Sept, 15th December, and 15th March. Advance tax is paid keeping in mind an approximate income and taxes that you would have to pay on your business and capital gain income by the end of the year. You as an individual are required to pay 30% of the expected annual tax that you are likely to pay for that financial year by 15th Sept, 60% by 15th Dec, and 100% by 15th March. Not paying would entail a penalty of annualized interest of around 12% for the period by which it was delayed.

When you are investing in the stock markets, it is very tough to extrapolate the capital gain (STCG) or profit that will be earned by selling shares for an entire year just based on STCG earned for a small period of time. So if you have sold shares and are sitting on profits (STCG), it is best to pay advance tax only on that profit which is booked until now. Even if you eventually end up making a profit for the entire year which is lesser than for what you had paid advance tax, you can claim for a tax refund. Tax refunds are processed in quick time by the IT department now.

You can make your advance tax payments online by clicking on **Challan No./ITNS 280** on <https://incometaxindiaefiling.gov.in/>.

### **Which ITR form to use**

You can declare capital gains either on ITR 2 or ITR4

ITR 4: When you have business income and capital gains

ITR 2: When you have salary and capital gains or just capital gains

## 4.7 – Short and long term capital losses

We pay 15% tax on short term capital gains and 0% on long term capital gains, what if these were not gains but net losses for the year.

Short term capital losses if filed within time can be carried forward for 8 consecutive years, and set off against any gains made in those years. For example if the net short term capital loss for this year is Rs.100,000/-, this can be carried forward to next year, and if net short term capital gain next year is say Rs.50,000/- then 15% of this gain need not be paid as taxes because this gain can be set off against the loss which was carried forward. We will still be left with Rs.50,000 ( $\text{Rs.}100,000 - \text{Rs.}50,000$ ) loss which be carried forward for another 7 years.

Long term capital losses can't be used to set off against long term gains as in the first place long term capital gains is exempt from any tax. So long term capital loss is a dead loss, and can't be set off or carried forward.

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## Key takeaways:

1. LTCG : Equity: 0%, Equity MF: 0%, Debt MF: 20% after indexation benefit
2. STCG: Equity: 15%, Equity MF: 15%, Debt MF: as per individual tax slab
3. You can use cost inflation index to determine and get the benefit from the indexed purchase value
4. Index purchase price = Indexed purchase value = Purchase value \* (CII for year of sale/ CII for year of purchase)
5. If you have bought and sold the same shares multiple times then use FIFO methodology to calculate holding period and Capital gains
6. STT is payable to the Govt and cannot be claimed as expense when investing

Interesting reads:

Livemint: If you pay STT STCG is 15% otherwise as per tax slab

Income tax India website – Cost inflation index utility

Taxguru – Taxation of income & capital gains for mutual funds

HDFC- Debt mutual funds scenario post finance bill (no2), 2014

**Disclaimer** – Do consult a chartered accountant (CA) before filing your returns. The content above is in the context of taxation for retail individual investors/traders only.

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# Taxation for Traders

## 5.1 – Quick Recap

Reiterating from the previous chapter –

You can classify yourself as an Investor if you hold equity investments for more than 1 year and show income as long term capital gain (LTCG). You can also consider yourself an investor and gains as short term capital gains (STCG) if your holding period is more than 1 day and less than 1 year. We also discussed on how it is best to show your capital gains as a business income if frequency of trades is higher or if investing/trading is your primary source of income.

In this chapter we will discuss on all aspects of taxation when trading is declared as a business income, which can be categorized either as:

1. **Speculative business income** – Income from intraday equity trading is considered as speculative. It is considered as speculative as you would be trading without the intention of taking delivery of the contract.
2. **Non-speculative business income** – Income from trading F&O (both intraday and overnight) on all the exchanges is considered as non-speculative business income as it has been specifically defined this way. F&O is also considered as non-speculative as these instruments are used for hedging and also for taking/giving delivery of underlying contract. Even though currently almost all equity, currency, & commodity contracts in India are cash settled, but by definition they give rise to giving/taking delivery (there are a few commodity future contracts like gold and almost all agri-commodity contracts with delivery option to it). Income from shorter term equity delivery based trades (held for between 1 day to 1 year) are also best to be considered as non-speculative business income if frequency of such trades executed by you is high or if investing/trading in the markets is your main source of income.

## 5.2 – Taxation of trading/business income

Unlike capital gains there is no fixed taxation rate when you have a business income. Speculative and non-speculative business income has to be added to all your other income (salary, other business income, bank interest, rental income, and others), and taxes paid according to the tax slab you fall in. You can refer to chapter 1 for tax slabs as applicable for FY 2015-16.

Let me explain this with an example:

- My salary – Rs.1,000,000/-
- Short term capital gains from deliver based equity – Rs.100,000/-
- Profits from F&O trading – Rs.100,000/-
- Intraday equity trading – Rs.100,000/-

Gives these incomes for the year, what is my tax liability?

In order to find out my tax liability, I need to calculate my total income by summing up salary, and all business income (speculative and non-speculative). The reason capital gains is not added is because capital gains have fixed taxation rates unlike salary, or business income.

**Total income (salary + business)** = Rs.1,000,000 (salary income) + Rs.100,000 (Profits from F&O trading) + Rs.100,000 (Intraday equity trading) = Rs 12,000,000/-

I now have to pay tax on Rs 12,000,000/- based on the tax slab –

- 0 – Rs.250,000 : 0% – Nil
- 250,000 – Rs.500,000 : 10% – Rs.25,000/-
- 500,000 – Rs.1,000,000 : 20% – Rs.100,000/-,
- 1,000,000 – 1,200,000: 30% – Rs.60,000/-
- Hence total tax : 25,000 + Rs.100,000 + Rs.60,000 = **Rs.185,000/-**

Now, I also have an additional income of Rs.100,000/- classified under short term capital gains from deliver based equity. The tax rate on this is flat 15%.

STCG: Rs 100,000/-, so at 15%, tax liability is **Rs.15,000/-**

**Total tax** = Rs.185,000 + Rs.15,000 = **Rs.200,000/-**

I hope this example gives you a basic orientation of how to treat your income and evaluate your tax liability.

We will now proceed to find a list of important factors that have to be kept in mind when declaring trading as a business income for taxation.

### 5.3 – Carry forward business loss

If you file your income tax returns on time (July 31st for non-audit case – extended to Aug 31st this year (2015), and Sept 30th for audit case) you can carry forward any business loss that is incurred.

Speculative losses can be carried forward for 4 years, and can be set-off only against any speculative gains you make in that period.

Non-speculative losses can be set-off against any other business income except salary income **the same year**. So they can be set-off against bank interest income, rental income, capital gains, but only in **the same year**.

You carry forward non-speculative losses to the next 8 years; however do remember carried forward non-speculative losses can be set-off only against any non-speculative gains made in that period.

For example consider this – my hotel business income is Rs 1,500,000/-, my interest income for the year is Rs.200,000/-, and I make a non-speculative loss of Rs 700,000. In such case my tax liability for the year would be –

My gain is Rs 1,500,000/ from business and Rs.200,000/- from interest, so total of Rs.1,700,000/-.

I have a non speculative business loss of Rs.700,000/-, which I can use to offset my business gains, and therefore lower my tax liability. Hence

$$\text{Tax liability} = \text{Rs.1,700,000} - 700,000 = \text{Rs.1,000,000/-}$$

So I pay tax on Rs.1,000,000/- as per the tax slab I belong to, which would be –

- 0 – Rs.250,000 : 0% – Nil
- 250,000 – Rs.500,000 : 10% – Rs.25,000/-
- 500,000 – Rs.1,000,000 : 20% – Rs.100,000/-,

Hence, Rs.125,000/- goes out as tax.

## 5.4 – Offsetting Speculative and non-speculative business income

Speculative (Intraday equity) loss can't be offset with non-speculative (F&O) gains, but speculative gains can be offset with non-speculative losses.

If you incur speculative (intraday equity) loss of Rs. 100,000/- for a year, and non-speculative profit of Rs. 100,000/-, then you cannot net-off each other and say zero profits. You would still have to pay taxes on Rs. 100,000/- from non-speculative profit, and carry forward the speculative loss.

For example consider this –

- Income from Salary = Rs. 500,000/-
- Non Speculative profit = Rs. 100,000/-
- Speculative loss = Rs. 100,000/-,

I calculate my tax liability as –

Total income = Income from Salary + Gains from Non Speculative Business income  
= Rs.500,000 + Rs.100,000 = **Rs. 600,000/-**

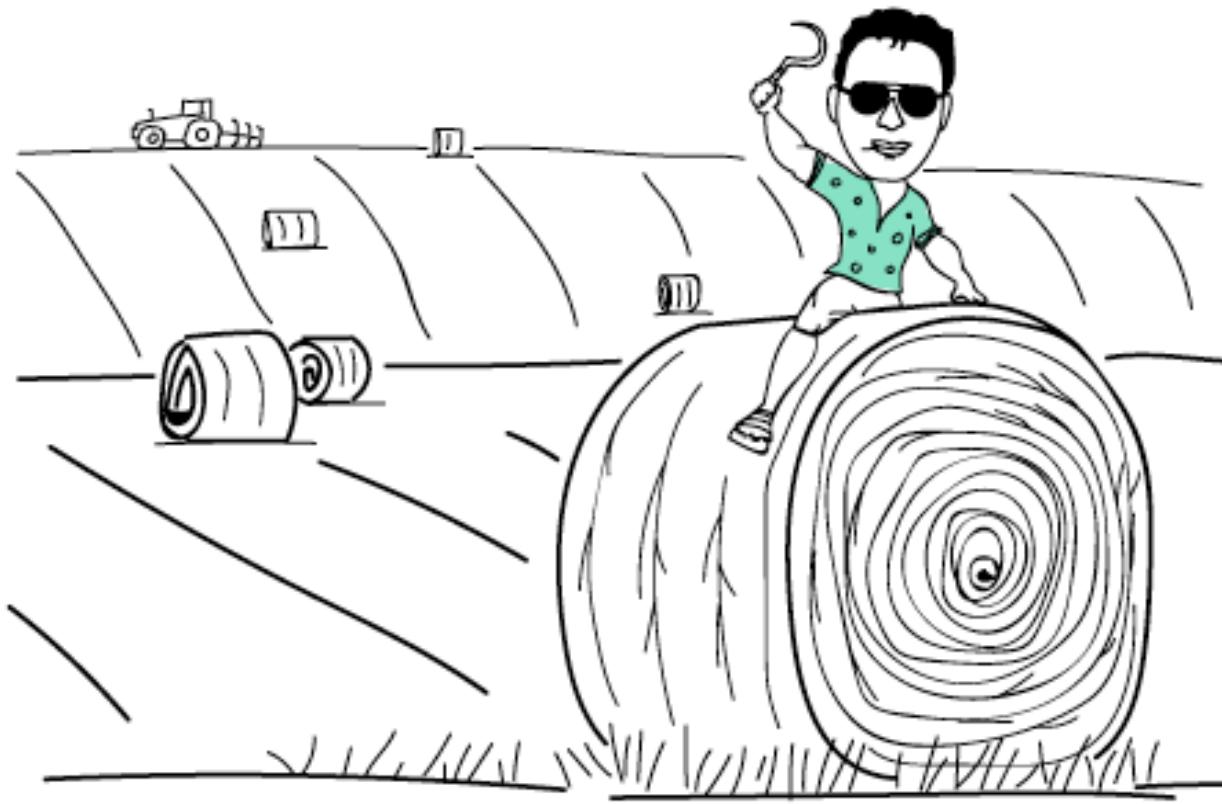
I'm required to pay the tax on Rs.600,000 as per the slab rates –

- 0 – Rs.250,000 : 0% – Nil
- 250,000 – Rs.500,000 : 10% – Rs. 25,000/-
- 500,000 – Rs.600,000 : 20% – Rs. 20,000/-,

Hence total tax = Rs.25,000 + Rs.20,000 = **Rs .45,000/-**

I can carry forward speculative loss of Rs.100,000/-, which I can set-off against any future (upto 4 years) speculative gains. Also to reiterate, speculative business losses can be set-off only against other speculative gains either the same year or when carried forward. Speculative losses can't be set-off against other business gains.

But if I had speculative gain of Rs. 100,000/- and non-speculative loss of Rs. 100,000/- they can offset each other, and hence tax in the above example would be only on the salary of Rs. 500,000/-.



## 5.5 What is tax loss harvesting?

Towards the end of a financial year you might have realized profits and unrealized losses. If you let it be, you will end up paying taxes on realized profits, and carrying forward your unrealized losses to next year. This would mean a higher tax outgo immediately, and hence any interest that you could have earned on that capital which goes away as taxes.

You can very easily postpone this tax outgo by booking the unrealized loss, and immediately getting back on the same trade. By booking the loss, the tax liability for the financial year would reduce. We at Zerodha are the only brokerage in India presently giving out a tax loss harvesting report, which will spot all opportunities for you to harvest losses. Click here to [learn more](#).

## 5.6 – BTST (ATST) – Is it speculative, non-speculative, or STCG?

BTST (Buy today Sell tomorrow) or ATST (Acquire today sell tomorrow) is quite popular among equity traders. It is called BTST when you buy today and sell tomorrow without taking delivery of the stock.

Since you are not taking delivery, should it be considered as speculative similar to intraday equity trading?

There are both schools of thought, one which considers it to be speculative because no delivery was taken. However I come from the second school, which is to consider it as non-speculative/ STCG as the exchange itself charges the security transaction tax (STT) for BTST trades similar to regular delivery based trades. A factor to consider is if such BTST trades are done just a few times

in the year show it as STCG, but if done frequently it is best to show it as speculative business income.

## 5.7 – Advance tax – business income

Paying advance tax is important when you have a business income. Like we discussed in the previous chapter, advance tax has to be paid every year – 30% by 15th Sep, 60% by 15th Dec, and 100% by 15th March. I guess the question that will arise is % of what?

The % of the annual tax that you are likely to pay, yes! When you have a business income you have to pay most of your taxes before the year ends on March 31st. The issue with trading as a business is that you might have a great year until September, but you can't extrapolate this to say that you will continue to earn at the same rate until the end of the financial year. It could be more or less.

But everything said and done, you are required to pay that advance tax, otherwise the penalty is 12% annualized for the time period it was not paid for. The best way to pay advance tax is by paying tax for that particular time period, so Sept 15th pay for what was earned until then, and by March 15th close to the year end, you can make all balance payments as you would have a fair idea on how you will close the year. You can claim a tax refund if you end up paying more advance tax than what was required to pay for the financial year. Tax refunds are processed in quick time by IT department.

You can make your advance tax payments online by clicking on **Challan No./ITNS 280** on <https://incometaxindiaefiling.gov.in/>

Also, here is an interesting link that helps you calculate your advance tax – <http://www.incometaxindia.gov.in/Pages/tools/advance-tax-calculator.aspx>. You can also **check this link** to see how exactly interest or penalty is calculated for non-payment of advance tax.

## 5.8 – Balance sheet and P&L statements –

When you have trading as a business income, you are required to like any other business create a balance sheet and P&L or income statement for the financial year. Both these financial statements might need an audit based on your turnover and profitability. We will discuss more on this in the next chapter.

## 5.9 – Turnover and Tax audit

When is audit required?

An audit is required if you have a business income and if your business turnover is more than Rs.1 Crore for the given financial year. Audit is also required as per section 44AD in cases where turnover is less than Rs.1 Crore but profits are lesser than 8% of the turnover.

We will discuss this in detail in the next chapter.

However let us understand what audit really means.

The dictionary meaning of the term “audit” is check, review, inspection, etc. There are various types of audits prescribed under different laws like company law requires a company audit; cost accounting law requires a cost audit, etc. Likewise the Income-tax Law requires the taxpayer to get the audit of the accounts of his business/profession from the view point of Income-tax Law if he meets the above mentioned turnover criteria.

Check this [link for FAQ's on tax audit](#) on the income tax website for more.

Audit can also be defined as having an accountant verify if you have filed everything right. In this case it is getting an accountant check if you have created a correct balance sheet and P&L statement for the year. Ideally this audit should be done by the IT department itself, but considering the number of balance sheets out there it is surely impossible for IT department to audit each one of them. Hence we need a Chartered accountant (CA), who is a qualified professional and authorized by Income tax department to perform audits on balance sheet and P&L statements. You the tax payer can use any CA of your choice.

What role should a CA play?

Ideally a CA is required to only audit and sign on the balance sheets and P&L statements. But a CA also typically ends up creating your balance sheets and P&L statements and will audit them only if required. We will in the next chapter briefly explain how a CA typically creates these two statements.

The importance of the audit process by a CA cannot be understated, apart from all the reporting requirements an audit also helps traders/investors know their financial health, ensure it faithfully reflects the income and claims for deduction are correctly made. It also helps lenders evaluate credibility, and act as a check for any fraudulent practices.

Which ITR form to use? – ITR 4, we will discuss more on this in the last chapter. I have come across incidents where people have declared both speculative and non-speculative as capital gains to avoid having to declare business income, and not having to use ITR4. Taking a shortcut like this could mean a lot of trouble if called for an IT scrutiny.

**Business expenses when trading** – Advantage of showing trading as a business is that you can show all expenses incurred as a cost which can then be used to reduce your tax outgo, and if a net loss for the year after all these costs, it can be carried forward as explained above.

Following are some of the expenses that can be shown as a cost when trading

- All charges when trading (STT, Brokerage, Exchange charges, and all other taxes). I hope you remember that STT can't be shown as a cost when declaring income as capital gains, but it can be in case of business income.
- Internet/phone bills if used for trading (portion proportionate to your usage on the bill)
- Depreciation of computer/other electronics (used for trading)
- Rental income (if the place used for trading, if a room used – portion of your rent)
- Salary paid to anyone helping you trade
- Advisory fees, cost of books, newspapers, subscriptions and more...

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## Key takeaways from this chapter

1. Speculative business income if trading intraday equity.
2. Non-speculative if trading F&O, or short term equity delivery actively.
3. Speculative losses can't be set-off against non-speculative gains.
4. Advance tax has to be paid when trading as a business – 30% by Sep 15th, 60% by Dec 15th and 100% by Mar 15th.
5. Can claim all expenses if income from trading shown as a business income.

**Disclaimer** – Do consult a chartered accountant (CA) before filing your returns. The content above is in the context of taxation for retail individual investors/traders only.

# Turnover, Balance Sheet, and P&L



## 6.1 – Turnover & Tax Audit

In the previous chapter, we discussed briefly on tax audit, and when it is required if you are declaring trading as a business income. To determine if an audit is required or not, we need to first determine the turnover of your trading business.

Reiterating – the requirement of calculating turnover arises only when treating trading P&L as a business income (An audit is not required if you only have capital gains income irrespective of the turnover). Turnover is only to determine if a tax audit is required or not. **Your tax liability does not get affected by your turnover.**

An audit is required if –

- **1 Crore mark** – Turnover for the year crosses the Rs 1 crore mark
- **Section 44AD** – If the turnover is less than 1 crore, and if **profit less than 8% of turnover**

I am sure the first thing that came to your mind after reading turnover is contract turnover, i.e

- Nifty is at 8000, you buy 100 Nifty
- Buy side value =  $8000 * 100 = \text{Rs.}800,000/-$
- Nifty goes to 8100, you square off the 100 Nifty
- Sell side value =  $8100 * 100 = \text{Rs.}810,000/-$
- Turnover = Buy side value + Sell side value =  $800,000 + 810,000 = \textbf{1,610,000/-}$

But it is **not** the contract turnover the IT department is interested in; they are interested in your **business turnover**.

Read below on how business turnover can be calculated –

The method of calculating turnover is a debatable issue and what makes it a grey area is that there is no guideline as such from the IT department. One article of great help though is the guidance note on tax audit under Section 44AB by ICAI (Institute of Chartered accountants of India, the governing body for CA's). The article on [Page 23, Section 5.12 of this guidance note](#) has a guideline on how turnover can be calculated. It says:

#### → **Delivery based transactions**

For all delivery based transactions, where you buy stocks and hold it more than 1 day and sell them, total value of the sales is to be considered as turnover. So if you bought 100 Reliance shares at Rs 800 and sold them at Rs 820, the selling value of Rs 82000 ( $820 \times 100$ ) can be considered as turnover.

But remember that the above calculation of turnover for delivery trades is only applicable if you are declaring equity delivery based trades also as a business income. If you are declaring them as capital gains or investments, there is no need to calculate turnover on such transactions. Also, there is no need of an audit if you have only capital gains irrespective of turnover or profitability.

#### → **Speculative transactions (intraday equity trading)**

For all speculative transactions, aggregate or absolute sum of both positive and negative differences from trades is to be considered as a turnover. So if you buy 100 share of Reliance at 800 in the morning and sell at 820 by afternoon, you make a profit or positive difference of Rs 2000, this Rs.2000 can be considered as turnover for this trade.

#### → **Non-speculative transactions (Futures and options)**

For all non-speculative transactions, the article says that turnover to be determined as follows –

- The total of favorable and unfavorable differences shall be taken as turnover
- Premium received on sale of options **is also** to be included in turnover
- In respect of any reverse trades entered, the difference thereon should also form part of the turnover.

So if you buy 25 units or 1 lot of Nifty futures at 8000 and sell at 7900, Rs.2500 ( $25 \times 100$ ) the negative difference or loss on the trade is turnover.

In options, if you buy 100 or 4 lots of Nifty 8200 calls at Rs.20 and sell at Rs.30. Firstly, the favorable difference or profit of Rs 1000 ( $10 \times 100$ ) is the turnover. But premium received on sale also has to be considered turnover, which is  $Rs\ 30 \times 100 = Rs\ 3000$ . So total turnover on this option trade =  $1000 + 3000 = Rs\ 4000$ .

The above calculations (points 1 to 3) are fairly straight forward; the next important thing to decide though is if you want to calculate turnover scrip wise or trade wise.

**Scrip wise** is when you calculate the turnover by collating all trades on the particular contract/ scrip for the financial year, find average buy/sell value, and then determine the turnover using the above 3 rules with the total profit/loss or favorable/unfavorable difference on this average price.

**Trade wise** is when you calculate the turnover by summing up the absolute value of profit and loss of every trade done during the year, and following the above rules.

Let me explain both with some examples –

1. 100 Nifty Jan future bought at 8000 and sold at 8100 on 1st Another 100 Nifty Jan future bought at 8100 and sold at 8050 on 10th Jan. Determine turnover

#### **Using scrip wise:**

Average Nifty Jan Fut buy: 200 Nifty Buy at 8050

Average Nifty Jan Fut sell: 200 Nifty Sell at 8075

Total profit/loss =  $200 \times Rs\ 25 = Profit\ of\ Rs\ 5000 = Turnover\ of\ Nifty\ Jan\ Futures$

#### **Using trade wise:**

100 Nifty Buy at 8000, Sell at 8100, Profit = Rs 10,000

100 Nifty Buy at 8100, Sell at 8050, Loss = Rs 5000

Turnover of Nifty Jan futures = Rs 10,000 + Rs 5000 (absolute sum of the loss) = Rs 15000

- 2.** 100 Nifty Dec 8000 puts bought at 100 and sold at 50 on Dec 3rd. Another 100 Nifty Dec 8000 puts bought at 50 and sold at 30. Determine turnover

### **Using scripwise:**

Average of Nifty Dec 8000 puts buy: 200 puts at 75

Average of Nifty Dec 8000 puts sell: 200 puts at 40

Total profit/loss = 200 x Rs 35 = Loss of Rs 7000

Total Selling value of options = 200 x Rs 40 = Rs 8000

Total Turnover for Dec 8000 puts = Rs 7000 + Rs 8000 = Rs 15000

### **Using tradewise:**

Trade 1

100 Nifty Dec puts bought at 100 and sold at 50, Loss = Rs 5000

Selling value of options = 100 x Rs 50 = Rs 5000

Turnover = Rs 10000

Trade 2

100 Nifty Dec puts bought at 50 and sold at 30, Loss = Rs 2000

Selling value of options = 100 x Rs 30 = Rs 3000

Turnover = Rs 5000

Total turnover = turnover of (trade 1+trade2) = Rs 15000

### **Which of the methods scrip wise or trade wise should I follow?**

Calculating turnover trade wise is the most compliant way of determining turnover. The tricky bit calculating trade wise turnover though is that **no broker (other than us at Zerodha)** currently offers trade wise turnover report. All brokers provide a P&L with an average buy/sell price, which can be used to calculate scrip wise turnover. If you are not trading at Zerodha and are looking at

calculating turnover tradewise, you will have to download all trades done during the year on an excel sheet and calculate turnover manually.

Here is the scrip wise and trade wise turnover reports on **Q** (Zerodha's reporting tool)

### Currency

|                      |          |
|----------------------|----------|
| FUTURES GROSS PROFIT | ₹-357.50 |
| OPTIONS GROSS PROFIT | N/A      |
| TOTAL GROSS PROFIT   | ₹-357.50 |
| FUTURES TURNOVER     | ₹357.50  |
| OPTIONS TURNOVER     | N/A      |
| TOTAL TURNOVER       | ₹357.50  |
| TOTAL CHARGES        | ₹177.39  |

≡ Details

### TURNOVER

The turnover is being calculated here just to determine if you need a tax audit or not. We are following [guidance note](#) on Tax audit under section 44AB (Section 5.12, Page 23).

- For Intraday equity — absolute sum of settlement profits and losses per scrip
- For Delivery equity — sell side value of the stock
- For F&O (Equity, Currency, Commodity) — absolute sum of settlement profits & losses for F&O per scrip and the sell side value of option contract.

If you want the turnover scripwise, you will see on the Tax P&L statement.

If you want the turnover tradewise, (more conservative/compliant way of turnover calculation))  [Click here to download your turnover statement.](#)

### F&O

|                      |             |
|----------------------|-------------|
| FUTURES GROSS PROFIT | ₹-192.50    |
| OPTIONS GROSS PROFIT | ₹-23,232.50 |
| TOTAL GROSS PROFIT   | ₹-23,425.00 |
| FUTURES TURNOVER     | ₹192.50     |
| OPTIONS TURNOVER     | ₹36,677.50  |
| TOTAL TURNOVER       | ₹36,870.00  |
| TOTAL CHARGES        | ₹417.76     |

TRADEWISE

SCRIPWISE

### ITR FORM TO BE USED

- Only Capital Gains (Equity) — ITR 2
- Futures and options — ITR 4, Trading as a business
- Presumptive income — ITR 4S

≡ Details

| A  | B   | C | D | E | F | G | H | I | J | K |
|----|---|---|---|---|---|---|---|---|---|---|
| 1  | ZERODHA   |   |   |   |   |   |   |   |   |   |
| 2  | The Discount Brokerage  |   |   |   |   |   |   |   |   |   |
| 3  |   |   |   |   |   |   |   |   |   |   |
| 4  | Tradewise Turnover Statement for All-FO from 01/04/2014 to 31/03/2015                                       |   |   |   |   |   |   |   |   |   |
| 5  | Total turnover  |   |   |   |   |   |   |   |   |   |
| 6  | Total tradewise futures turnover 192.50   |   |   |   |   |   |   |   |   |   |
| 7  | Total tradewise options turnover with sell val: 49277.50  |   |   |   |   |   |   |   |   |   |
| 8  | Tradewise Futures Turnover  |   |   |   |   |   |   |   |   |   |
| 9  | Trade details Date Buy qty Buy avg Buy value Sell qty Sell avg Sell value Turnover Total turnover           |   |   |   |   |   |   |   |   |   |
| 10 | NIFTY14MAYFUT 21/05/2014 50.00 7297.90 364895.00 50.00 7294.05 364702.50 192.50                             |   |   |   |   |   |   |   |   |   |
| 11 | Total turnover 192.50   |   |   |   |   |   |   |   |   |   |
| 12 | Tradewise Options Turnover  |   |   |   |   |   |   |   |   |   |
| 13 | Trade details Date Buy qty Buy avg Buy value Sell qty Sell avg Sell value Turnover Turnover with sell value |   |   |   |   |   |   |   |   |   |
| 14 | ITC15MAR370CE 04/03/2015 2000.00 0.00 0.00 2000.00 3.15 6300.00 6300.00 12600.00                            |   |   |   |   |   |   |   |   |   |
| 15 | ITC15MAR370CE 05/03/2015 1000.00 3.55 3550.00 1000.00 0.00 0.00 3550.00 3550.00                             |   |   |   |   |   |   |   |   |   |
| 16 | ITC15MAR370CE 28/02/2015 1000.00 12.50 12500.00 1000.00 0.00 0.00 12500.00 12500.00                         |   |   |   |   |   |   |   |   |   |
| 17 | ITC15MAR370CE 28/02/2015 1000.00 12.50 12500.00 1000.00 0.00 0.00 12500.00 12500.00                         |   |   |   |   |   |   |   |   |   |
| 18 | SUNPHARMA15JAN960CE 28/01/2015 250.00 1.00 250.00 250.00 1.05 262.50 262.50 275.00                          |   |   |   |   |   |   |   |   |   |
| 19 | NIFTY15JAN880OPE 28/01/2015 25.00 9.45 236.25 25.00 0.00 0.00 236.25 236.25                                 |   |   |   |   |   |   |   |   |   |
| 20 | NIFTY14JUL760OCE 10/07/2014 50.00 105.80 5290.00 50.00 96.10 4850.00 485.00 5290.00                         |   |   |   |   |   |   |   |   |   |
| 21 | NIFTY15MAR860OPE 27/02/2015 25.00 93.05 2326.25 25.00 82.10 2052.50 273.75 2326.25                          |   |   |   |   |   |   |   |   |   |
| 22 | Total turnover 35857.50   |   |   |   |   |   |   |   |   |   |
| 23 | 49277.50  |   |   |   |   |   |   |   |   |   |
| 24 | EQ TURNOVER NO TURNOVER CDS TURNOVER COM TURNOVER   |   |   |   |   |   |   |   |   |   |

Once you determine the turnover, you will know if you need an audit or not, that is if a visit to a CA and have him verify your balance sheet and P&L statements is compulsory or not.

## 6.2 – Section 44AD

An audit is also required as discussed above if your profit is less than 8% of the turnover. By turnover I am referring to all business turnover (speculative, non-speculative, and any other business you have), and by profit I am referring to only your net business profits(not including, salary, capital gains, and others). This means that if you are trading as a business and incur a loss, you will most likely have to get the books audited.

But an important thing to remember is that if your turnover is less than 1 crore and if your profit is less than 8% of turnover an audit is not required if your total tax liability for the year is zero. That means if your total income (Salary + Business income + capital gain) is less than Rs 2.5lks (minimum tax slab), you have no tax liability and hence audit not required.

*Applying section 44AD for trading as a business income is causing huge inconvenience for the retail trading community. Turnover in an ordinary business to turnover while trading on the markets is hugely different. Unlike an ordinary business where there is a fixed margin every time there is a transaction, in the business of trading there is no such guarantee. This section is an unnecessary burden that indirectly gets most small retail traders to have their books audited. We at Zerodha have petitioned to the government through this [campaign on Change.org](#), make sure to support it and also get your trading friends to do the same.*

When you show trading as a business income, you will have to file using ITR4, which would mean that like any other business you are required to create and maintain –

- Balance Sheet
- P&L statement
- Books of Accounts

Like discussed above, these will need to be audited based on your turnover (either turnover crosses the 1 Crore mark or in case the turnover is less than 1 Crore and your profits is less than 8% of the total turnover). Creating balance sheet, P&L, and maintaining books of account is quite simple for individuals with just trading as a business income, it is explained below in brief.

## 6.3 – Balance sheet, P&L, Book of accounts

### **Balance sheet**

A personal balance sheet provides an overall snapshot of your wealth at a specific period in time. It is a summary of your assets (what you own), your liabilities (what you owe) and your net worth (assets minus liabilities).

**Creating a personal balance sheet** is fairly simple first pull together all of these information:

- Your latest bank statements
- Loan statement
- House loan statement
- Personal loan statements
- Principal balance of any outstanding loans
- Demat holding statement

Once you have all of that information available, start developing your balance sheet by listing all of your assets (financial and tangible assets) with its respective values. Typical examples of the assets could be –

- Cash (in the bank, in hand , deposits with Bank)
- All investments (mutual funds, Shares , Debt investment )
- Property value ( Cost of Purchase + Duty any paid + Interiors etc)
- Automobile value ( Motor Car + Two wheeler )
- Personal Property Value ( jewelry, household items, etc)

- Other assets ( Computers, Loans to friends , plot of land etc)

The sum of all of those values is the total value of your **assets**.

Next, you can look at your liabilities, which should be everything you owe. Here are some common liability categories:

- Remaining mortgage balance (Loan Statement)
- Car loans
- Student loans
- Any other personal loans
- Credit card balances

The sum of all of the money you owe is your **liabilities**.

The difference between your assets and your liabilities is your **net worth**.

That's it; this is your balance sheet. Instead of creating one at the end of every financial year, it probably makes sense to update once every few months.

## Profit & Loss statement

Profit and loss will summarize your revenue streams and your expenses for the financial year.

To create your P&L for the given Financial Year, you will have to list down all revenues and expenses.

Revenue –

- Realized sale value from your stock holdings (Capital gains)
- The Income from F&O, Intraday, or Commodity Trades. (Speculative and non-speculative business income)

Remember that you can't add your salary income (if you are working elsewhere) into your revenue stream on the P&L.

Expenses –

- Salaries, if you have people helping you trade.
- Rent, if you are using an office or any space for trading activity for which you are paying a rental income
- Brokerage charges, taxes, and all other trade related expenses.

- ➡ Advisory fees, consultancy, depreciation of computer, and etc (read the expenses section in the chapter on taxation-traders)

Revenue minus the Expense equals profit.

A **Balance sheet** helps you understand your networth between two dates and the **P&L** will give you the reasons why your networth went up or down in that period. Maintaining financial discipline is the key to long term personal wealth creation. A personal balance sheet and P&L will ensure that you are constantly in touch with reality – your assets and liabilities.

### **Book of accounts/Book-keeping**

Maintaining book of accounts and Book-keeping seem like very complex tasks, and typical reactions I have seen from traders is to get scared of the word and try postponing the decision to learn more on the topic. Again for an individual with only trading as a business income and/or salary, it is super simple- you just need to maintain two books.

**Bank book:** Take an excel download of all your bank statements, and make a note next to every entry to identify the nature of the transaction. It is also best to keep a copy of all the bills in case of expenses.

**Trading book:** This should be automatically getting maintained for you by the broker where you trade. The broker should be able to give you a P&L statement including all expenses for the year, ledger statement, and an online repository of contract notes if required. Unlike what many people think, contract notes aren't really required unless a scrutiny by the IT department, and even then if only asked for the same.

As a person who has traded with over 10 online brokers in India, the ledger and P&L statements with all expenses on it will show up any hidden charges by the broker.

At Zerodha, **we take great pride in the transparency we bring in as a business.** Every charge other than brokerage is captured on the other credits/debits section on the tax P&L on Q. We also give you a summary with value of all your open option positions starting April 1st and closing March 31st. This is extremely useful when you are trying to tally your ledger with your P&L statement.

| A  | B                                   | C          | D           | E           | F                                    | G                     |
|----|-------------------------------------|------------|-------------|-------------|--------------------------------------|-----------------------|
| 9  |                                     |            |             |             |                                      |                       |
| 10 | Open option positions on 01/04/2014 |            |             |             |                                      |                       |
| 11 | Contract                            | Exchange   | Type        | Quantity    | Closing price                        | Value                 |
| 12 | NIFTY14APR7100CE                    | NSE-FO     | B           | 500.00      | 11.45                                | 5725.00               |
| 13 | NIFTY14APR6500PE                    | NSE-FO     | B           | 100.00      | 38.85                                | 3885.00               |
| 14 | AXISBANK14APR1600CE                 | NSE-FO     | B           | 250.00      | 14.65                                | 3662.50               |
| 15 |                                     |            |             |             | Total buy premium                    | 13272.50              |
| 16 |                                     |            |             |             |                                      |                       |
| 17 | Contract                            | Exchange   | Type        | Quantity    | Closing price                        | Value                 |
| 18 | NIFTY14APR6400PE                    | NSE-FO     | B           | 100.00      | 24.30                                | 2430.00               |
| 19 |                                     |            |             |             | Total sell premium                   | 2430.00               |
| 20 |                                     |            |             |             |                                      |                       |
| 21 |                                     |            |             |             | Total premium present on 01/04/2014  | 10842.50              |
| 22 |                                     |            |             |             | Ledger balance on 01/04/2014         | 694692.03             |
| 23 |                                     |            |             |             | Opening ledger balance on 01/04/2014 | 705534.53             |
| 24 |                                     |            |             |             |                                      |                       |
| 25 | Open option positions on 31/03/2015 |            |             |             |                                      |                       |
| 26 | Contract                            | Exchange   | Type        | Quantity    | Closing price                        | Value                 |
| 27 | HINDALCO15APR135CE                  | NSE-FO     | B           | 2000.00     | 3.50                                 | 7000.00               |
| 28 | ASHOKLEY15APR70CE                   | NSE-FO     | B           | 8000.00     | 5.35                                 | 42800.00              |
| 29 | ASHOKLEY15APR67.5PE                 | NSE-FO     | B           | 8000.00     | 0.90                                 | 7200.00               |
| 30 | HDIL15APR100PE                      | NSE-FO     | B           | 4000.00     | 4.75                                 | 19000.00              |
| 31 | ASHOKLEY15APR70PE                   | NSE-FO     | B           | 8000.00     | 1.60                                 | 12800.00              |
| 32 |                                     |            |             |             | Total buy premium                    | 88800.00              |
| 33 |                                     |            |             |             |                                      |                       |
| 34 | Contract                            | Exchange   | Type        | Quantity    | Closing price                        | Value                 |
| 35 |                                     |            |             |             | Total sell premium                   | 0.00                  |
| 36 |                                     |            |             |             |                                      |                       |
| 37 |                                     |            |             |             | Total premium present on 31/03/2015  | 88800.00              |
| 38 |                                     |            |             |             | Ledger balance on 31/03/2015         | 182449.82             |
| 39 |                                     |            |             |             | Opening ledger balance on 31/03/2015 | 271249.82             |
| 40 |                                     |            |             |             |                                      |                       |
| 41 |                                     |            |             |             |                                      |                       |
| 42 |                                     |            |             |             |                                      |                       |
| 43 |                                     |            |             |             |                                      |                       |
| 44 |                                     |            |             |             |                                      |                       |
|    | EQ-TAX-PNL                          | FO-TAX-PNL | CDS-TAX-PNL | COM-TAX-PNL | OTHER CREDITS AND DEBITS             | OPEN OPTION POSITIONS |
|    | Ready                               |            |             |             |                                      |                       |

We are almost done with the taxation module. The last chapter will have an explanation on what kind of ITR forms to use, and also an excel download of a sample ITR 4 form with all details as an easy reference.

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## Key takeaways from this chapter –

1. Audit of the books is required if turnover is more than INR 1 Crore mark
2. Audit of the books is required if turnover is less than INR 1 Crore but if the profits is less than 8%
3. Audit of the books is NOT required if turnover is less than INR 1 Crore and profits higher than 8% of the turnover
4. Turnover does not take into consideration the regular contract turnover
5. Turnover refers to the business turnover
6. Business turnover (for trading as a business) can be calculated scripwise or tradewise
7. Trade wise turnover is the most compliant way of declaring turnover.
8. If you are declaring trading as a business then one needs to use the ITR4 form to file tax returns
9. ITR4 requires you to have Balance Sheet and Profit and Loss statement along with books of account
10. Balance sheet equation states that Net worth = Assets – Liabilities
11. P&L statement details the revenues and expenses
12. If trading as a business maintaining 2 books of account becomes mandatory – Bank Book and Trade book
13. It is advisable to maintain and update Balance Sheet, P&L, and books of account once in every quarter.

**Disclaimer** – Do consult a chartered accountant (CA) before filing your returns. The content above is in the context of taxation for retail individual investors/traders only.

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# ITR Forms (The Finale)

## 7.1 – Income Tax Return (ITR) Forms

The last step of taxation is filing your Income tax returns (ITR), and this can be done using ITR forms. Find below brief explanation on everything important on ITR that you need to know as an investor/trader.

I have noticed from my interactions with many that they are confused between the two actions i.e ‘paying income tax’ and ‘filing income tax’. Many are of the opinion that if they pay income tax the act of filing income tax is not really necessary. This is not true, let me explain why.

**Paying Income tax** – If you are employed and draw a salary you very clearly know that your employer on your behalf deducts tax (based on your tax slab) and pays the income tax on your behalf. This is usually called ‘**Tax Deducted at source (TDS)**’. Now what if you have an income sources besides your salary?

For example for the given year assume besides drawing a salary, you also made a profit by actively trading delivery based equity trading. As we now know this activity falls under “Non-speculative Business Income”. Since the employer is not privy to this activity it becomes your responsibility to declare this source of income to the Income tax department and paying the appropriate amount as tax.

**Filing Income tax returns** – Filing income tax returns is a mandatory way of communicating to the IT department all the sources of income you have including your salary. An **Income Tax Return Form (ITR)** form is simply a form that you need to fill up declaring your sources of income. There are different ITR forms for different sources of income. You may wonder why I should file my returns when I don’t have any other source of income besides salary. Well, in such a case by virtue of filing your income tax returns (via appropriate ITR form) you are officially communicating to the income tax department that you do not have any other source of income.

So in essence, the act of filing your returns is your official communication to IT department about all the source of income that you have along with the tax you have paid against that income. You do this via the prescribed **ITR forms**.

More formally, an ITR is a prescribed form through which the particulars of income earned by a person in a financial year and taxes paid on such income are communicated to the Income-tax Department. There are different types of ITR forms, one needs to select the appropriate ITR form, based on the different sources of income. These forms can be downloaded from here <https://incometaxindiaefiling.gov.in/>

## 7.2 – ITR forms and its uses

In the context of this module, which is focused towards individuals having investments as capital gains or trading as a business income, the important ITR forms to know about are:

**ITR 1** – when you have only salary, interest income, or rental income from only one house property, you can use ITR 1 forms to file your income tax returns. This is the most common type, but if you have capital gains or trading as a business income, you can't use this ITR form.

**ITR 2** – when you have salary, interest income, income from house property or **income from capital gains**, you can use ITR 2. So if you are an individual who only invests in the market (remember investor, hence capital gains), you need to use ITR2

**ITR 4** – when you have salary, interest income, income from house property, income from capital gains, and income from business/profession, you can use ITR 4.

So if you are an individual who is declaring trading as a business income, you have to use ITR 4. If you are an investor and trader, you can show trading under business income and investments as capital gains on the same ITR 4 form.

**ITR 4S (Sugam)** – this is similar to ITR4 but with presumptive scheme if section 44AD and 44AE used for computation of business income. ITR 4S can't be used if you have speculative business income (intraday equity); losses to be carried forward, or short term capital gains tax (STCG). So you can use ITR 4S only if you have non-speculative trading income, but it is best avoided.

## 7.3 – Exploring ITR 4S

The advantage of ITR 4S is that it can be used by tax payers who do not maintain regular book of accounts or want it to be audited (refer chapter 2) provided your turnover is lesser than Rs 1 Crore for the year.

You can get away without maintaining books or getting audited if you firstly calculate turnover based on section 44AD (check the previous chapter) and then declare 8% of this turnover as your

presumptive income. You have to then pay taxes adding this 8% of the turnover to your other income and pay tax as per the slabs.

So if you are a trader with turnover less than Rs 1 Crore for the year and profit less than 8% of the turnover with only non-speculative business income (not possible if you have speculative business income or short term capital gain), you can declare presumptive income of 8% of the turnover, and get away from the need to get your books audited. There is no need to pay advance taxes if you are using ITR4S, but you are not allowed to deduct any business expenses against your income.

For example, assume my salary was Rs.500,000/- for the last FY, and I had incurred F&O loss of Rs.25,000/- on a turnover of Rs.400,000/-. Since my profit is less than 8% ( $25,000/400,000$ ) of my turnover I will need to use ITR4, maintain books, and have them audited. Instead of this, I could use ITR4S and declare 8% of Rs.400,000/- (business turnover) or Rs.32,000/- as my presumptive trading business income even though I have incurred a loss.

My total income for the year is Rs 500,000 (salary) + R 32,000 (business income) = Rs.532,000/-. Therefore my tax liability would be as follows –

Upto Rs.250,000 – No Tax

Between Rs.250,000 to Rs.500,000 – 10% – Rs.25,000/-

Between Rs.500,000 to Rs.532,000 – 20% – Rs.6,400

Total tax = Rs.25,000 + Rs.6,400 = Rs.31,400/-

Here, by virtue of declaring a presumptive business income of Rs.32,000/- I'm paying additional tax of Rs.6,400/-. This works out to be a much cheaper alternative than getting an audit done for which the CA fees could have been Rs.15,000/- and above. So using ITR4S would make sense only if your turnover is low, hence declaring 8% of turnover as income would work out cheaper than paying an audit fees to the CA.



## 7.4 – Quick FAQ and notes

### **How to file the return of income electronically?**

Income-tax department has established an independent portal for e-filing of return of income. You can log on to [www.incometaxindiaefiling.gov.in](http://www.incometaxindiaefiling.gov.in) for e-filing the return of income. Check [this very nice video](#) on e-filing put by the IT department.

### **Is it necessary to attach documents along with return of income?**

ITR return forms are attachment less forms. Hence along with the ITR form (whether filed manually or filed electronically), you are not required to attach any document (like proof of investment, TDS certificates, etc) unless if you fall under the audit case.

However, these documents should be retained by you and should be produced before the tax authorities when demanded in situations like assessment, inquiry, scrutiny etc. But in audit cases, soft copy of balance sheets, P&L, and any notes along with the audit report needs to be attached.

### **What is the difference between e-payment and e-filing?**

E-payment is the process of electronic payment of tax (i.e., by net banking or SBI's debit/credit card)

E-filing is the process of electronically furnishing (filing) of return of income.

Using the e-payment and e-filing facility, payment of tax and furnishing of return is quick, easy, and hassle free.

### **Is it necessary to file return of income when I do not have any positive income?**

If you have sustained a loss in the financial year, which you propose to carry forward to the subsequent year for adjustment against subsequent year(s) positive income, you must make a claim of loss by filing your return before the due date.

What are the due dates for filing returns of income/loss?

If no audit: July 31st (Extended to Aug 31 this year of 2015)

If audit: September 30th

### **If I fail to furnish my return within the due date, will I be fined or penalized?**

Yes, if you have not furnished the return within the due date, you will have to pay interest on tax due. If the return is not filed up to the end of the assessment year, in addition to interest, a penalty of Rs. 5,000 shall be levied under section 271F.

## **Can return be filed after the due date?**

Yes you can. Return filed after the prescribed due date is called as a belated return. If one could not file the return of income on or before the prescribed due date, then he can file a belated return. A belated return can be filed within a period of one year from the end of the assessment year or before completion of the assessment, whichever is earlier. A belated return attracts interest and penalty as discussed in previous FAQ.

For Example – In case of income earned during FY 2013-14, the belated return can be filed up to 31st March, 2016. However, if return is filed after 31st March, 2015, penalty under section 271F can be levied.

## **If I have committed any mistake in my original return, am I permitted to file a revised return to correct the mistake?**

Yes, provided the original return has been filed before the due date and the IT Department has not completed the assessment. It is expected that the mistake in the original return is of a genuine and bona fide nature and not rectification of any deliberate mistake. However, a belated return (being a return filed after the due date) cannot be revised.

Return can be revised within a period of one year from the end of the relevant assessment year or before completion of the assessment whichever is earlier.

Example, in case of income earned during FY 2013-14, the due date of filing the return of income (considering no audit) is 31st July, 2014. If the return of income is filed on or before 31st July, 2014 then the return can be revised upto 31st March, 2016 (assuming assessment is not completed by that date). However, if return is filed after 31st July, 2014, then it will be a belated return and a belated return cannot be revised.

ITR forms are typically Microsoft Excel sheets where you can fill all the relevant details, and the calculations happen automatically.

Find attached an ITR 4 form with all types of income, salary, capital gains, trading as a business, and rental income. This should act as an easy reference if you are trying to fill this on your own. This is the ITR4 form from AY 14/15(FY 13/14).

[XLS Sample ITR4 Form.](#)

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## Key takeaways from this chapter

1. The act of paying your taxes is called “Tax Payment”, which can be done via e-payment
2. The act of communicating different sources of income and tax paid against that is called “Income Tax Return filing”
3. Filing income tax returns is mandatory, even though you have paid taxes
4. An ITR form should be used to file taxes
5. Use different ITRs for different sources of income
6. ITR 4S for presumptive business income. Use this to lower your cash outflow (paying taxes versus audit fees)

Phew! That brings us to the end of the taxation module. Keeping it simple is most challenging, especially a topic like this where almost every other word is a jargon. Hopefully I have done a decent job with it, and this module acts as your ready reckoner for everything on taxation when trading and investing.

Financial discipline is the key to long term wealth creation, and it starts with compliant filing of your income tax returns. It is best not to avoid or postpone especially with advancement of technology and reach of our income tax department.

Do help spread the word,

Happy Trading,

**Nithin Kamath**

Zerodha

**Special thanks to **Tax IQ** for providing valuable inputs throughout this module.**

**Disclaimer** – Do consult a chartered accountant (CA) before filing your returns. The content above is in the context of taxation for retail individual investors/traders only.