

Step By Step Learning Of DERIVATIVES

INTRODUCTION:

Dear Friend's

We thought it might be helpful to you if you took you through a step-by-step process of learning derivatives. This is based on a series of questions and answers on topics we have listed down.

You can click on the relevant topic and go straight down to the questions and answers on that area.

We welcome your feedback on this section and look forward to helping you more.

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STEP-1 **How to benefit from stock futures**

You are bullish on a stock say Satyam, which is currently quoting at Rs 280 per share. You believe that in one month it will touch Rs 330.

Question: What do you do?

Answer: You buy Satyam.

Effect: It touches Rs 330 as you predicted – you made a profit of Rs 50 on an investment of Rs 280 i.e. a Return of 18% in one month – Fantastic!!

Wait: Can it get any better?

Yes!!

Question: What should you do?

Answer: Buy Satyam Futures instead.

Effect: On buying Satyam Futures, you get the same position as Satyam in the cash market, but you pay a margin and not the entire amount. For example, if the margin were 20%, you would pay only Rs 56. If Satyam goes up to Rs. 330, you will still earn Rs 50 as profit. Now that translates into a fabulous return of 89% in one month.

Unbelievable!! But True nevertheless!!

This is the advantage of 'leverage', which Stock Futures provide. By investing a small margin (ranging from 10 to 25%), you can get into the same positions, as you would be able to in the cash market. The returns therefore get accordingly multiplied.

Question: What are the risks?

Answer: The risks are that losses will be getting leveraged or multiplied in the same manner as profits do. For example, if Satyam drops from Rs 280 to Rs 250, you would make a loss of Rs 30. The Rs 30 loss would translate to an 11% loss in the cash market and a 54% loss in the Futures market.

Question: How can I reduce such losses?

Answer: It is very easy to reduce/minimize such losses if you keep a sharp eye on the market. Suppose, you are bullish and you hence buy Satyam futures. But Satyam futures start moving down after you have bought. You can square up your position at any point of time thereafter. You can buy at 10:30 in the morning and sell off at 11:00 on the same day. There is no restriction at all.

Thus, by squaring up early enough you could stem your possible losses.

Question: How long do Futures last and when do they expire?

Answer: Futures expire on the last Thursday of every month. For example, January Futures will expire on 31st January (last Thursday).

Question: What is the implication of expiry?

Answer: Suppose you have bought January Futures on Satyam and have not squared up till the end. On 31st January, your Futures will be compulsorily sold at the closing cash market price of Satyam and your profit or loss will be paid out or demanded from you as the case may be.

Question: Apart from leverage, how can I use Futures?

Answer: A great advantage of Futures (at the moment) is that they are not linked to 'delivery'. Which means, you can sell Futures (short sell) of Satyam even if you do not have any shares of Satyam? Thus, you can benefit from a downturn as well as from an upturn. If you predict an upturn, you should buy Futures and if you predict a downturn, you can always sell Futures – thus you can make money in a falling market as well as in a rising one –

an opportunity that till recently was available only to brokers/operators and not easily to retail investors.

Question: How can I do vyaj badla through Futures?

Answer: In vyaj badla, your broker used to buy shares at a lower rate and immediately sell the same shares at a slightly higher rate generating a return for you. For example, he would buy Satyam at Rs 150 and sell at Rs 152 generating a return of Rs 2 for you. This would effectively generate a certain yield per annum on your investment. Badla sessions used to be held on Saturdays and one badla transaction would typically run for one week.

In futures, such badla opportunities arise constantly – thus futures can be understood as 'badla on tap'. You should look for opportunities where futures prices are higher than cash prices. For example, if Satyam is quoting at Rs 250 in the cash market and one-month Satyam futures are quoting at Rs 253 in the futures market, you can earn Rs 3 as difference. You will then buy Satyam in the cash market and at the same time, sell Satyam one-month futures.

On or around the expiry day (last Thursday of each month), you will square up both the positions, i.e. you will sell Satyam in the cash market and buy futures. The two prices will be the same (or very nearly the same), as cash and futures prices will converge on expiry. It does not matter to you what the price is. You will make your profit of Rs 3 anyway.

For example, if the price is Rs 270, you will make a profit of Rs 20 on selling your Cash market Satyam and a loss of Rs 17 on buying back Satyam futures. The net profit is Rs 3. On the other hand, if the price is Rs 225, you make a loss of Rs 25 on selling Cash market Satyam and a profit of Rs 28 on Satyam futures. The net profit remains Rs 3.

Your investment in this transaction will be Rs 250 on cash market Satyam plus a margin of say 20% on Satyam futures (say Rs 50 approx). Thus an investment of Rs 300 has generated a return of Rs 3 i.e. 1% per month or 12% per annum.

Now take a situation where only 15 days are left for expiry and you spot the same opportunity as above. You will still generate Rs 3, which will translate into a return of 2% per month or 24% per annum.

In this manner, you will generate returns whenever the futures prices are above cash market prices.

Question: What precautions should I take in such transactions and what risks am I exposed to?

Answer: You need to factor in brokerage costs and demat charges for the above transactions. The net returns should be considered for decision-making purposes.

There is an execution risk in the sense that you might not get exactly the same price in the cash market and the futures market when you square up on or around the last day. For example, if you sell your Cash market Satyam shares for Rs 270 and buy back Satyam futures at Rs 270.20; there is a small difference of Rs 0.20 which will affect your net profit. This impact might be favorable or adverse but is nevertheless possible. It is however quite likely that the difference might be very small on or around the last day.

Question: Do I need to wait till the last day?

Answer: No – you might find profitable exit opportunities much before the last day also. For example, if the price of Satyam shares is Rs 240 after 3 days and Satyam futures are quoted at Rs 241, you could very exit both positions. You will make a loss of Rs 10 on cash market and a profit of Rs 12 on futures, resulting in a net profit of Rs 2.

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STEP-2 **Badla/Hedging through futures**

Question: In the last Article, you explained how vyaj badla could be done using Stock Futures. What other badla can be done?

Answer: Share badla can also be done using Stock Futures. This includes undha badla possibilities also.

Question: Please tell me about Share badla. Who can get into Share badla?

Answer: Typically, the Share badla participant owns shares and is in need of funds for a short period of time.

Question: Why can't I sell the shares if I need cash?

Answer: Yes you definitely can, but you will lose the profit from upside if the share price were to move up.

Question: You mean, I can protect the upside and still get cash for my shares?

Answer: Yes – that is exactly what I mean.

Question: How?

Answer: Suppose you have 1,200 shares of Satyam, which is currently quoting at Rs 220 per share – a total value of Rs 2.64 lakhs. You need cash, but protect the upside profits.

All you need to do is – one – sell your shares in the cash market and get paid the Rs 2.64 lakhs and – two – buy Satyam (one month) futures in the derivatives market (say at Rs 221 per share).

The futures position will keep your profits intact, if the share price moves up.

Question: How do I get my shares back and when?

Answer: The futures will expire on the last Thursday of the month. On the last Thursday (or before that at any convenient time), you should reverse the transaction i.e. you will sell your Satyam futures and buy back Satyam shares.

Question: Will I not carry a price risk – price of Satyam shares may move up or down in the interim period.

Answer: No, your position will be a covered position – any market movements will not affect you at all. Suppose Satyam moves up to Rs 250 at the month end, you will find that you have made a loss of Rs 1 per share (Rs 30 loss on the cash market shares and Rs 29 profit on Satyam futures).

On the other hand, if Satyam moves down to Rs 200 per share you will still have made a loss of Re 1 per share (Rs 20 profit on the cash market shares and Rs 21 profit on Satyam futures).

Question: Why do I make this loss?

Answer: The loss of Re 1 per share is your interest cost. You have enjoyed Rs 2.64 lakhs for a period of (let us say) one month. The interest cost for this borrowing is only Rs 1,200 (Re 1 per share on 1,200 shares). This works out to an interest cost of less than half percent per month (very attractive borrowing rate).

Question: How do I know when this type of share badla is attractive?

Answer: You should watch the cash market and futures market prices closely and look for opportunities when the futures market price is not too high. For example in the above case, the futures prices were only Re 1 higher than the cash market prices. You should then convert this Re 1 cost into an annualized interest cost. For example $(1/220 = 0.45\%)$.

If only 10 days are left for expiry, this would translate to a higher rate of 1.35% per month $(0.45 * 30/10)$.

Question: What is undha badla and how can this be affected in the futures market?

Answer: Undha badla in the olden days was a situation, which could sometimes emerge due to a bear trap. If some bears have short sold shares and are unable to deliver them, bulls could trap them. Bears would then negotiate for delivery and bulls would let them have delivery, but at a price. Thus, the bulls would enjoy the best of both worlds – viz – funds and liquidity (on sale through delivery basis) and also badla long position (advantage of profiting on price rises).

Question: How does this happen in the futures market now?

Answer: In the futures market, undha badla is much simpler. Whenever futures are quoted at a price lower than the cash market price, the situation is undha. For example, if Satyam shares are quoting in the cash market at Rs 220 and Satyam (one month) Futures are quoting at Rs 218, you have a classic undha situation going.

Question: What should I do?

Answer: You sell Satyam shares in the cash market (you should have Satyam with you like in the share badla example above) at Rs 220 and at the same time buy Satyam Futures at Rs 218 in the derivatives market. On expiry (or before that whenever you find prices converge), you should liquidate both positions. That is, you should buy back Satyam cash shares and sell Satyam Futures. It does not matter whether Satyam has moved up or down in the meantime, as your position is completely hedged.

Question: What is the benefit to me?

Answer: You have enjoyed liquidity for one month (say Rs 2.64 lakhs in the above example) and you have also enjoyed a profit of Rs 2 per share (or Rs 2,400 on 1,200 Satyam shares). This profit is similar to interest earned by the undha badla player.

Question: I have heard that hedging is possible using Futures. What does this mean?

Answer: Hedging is certainly possible using Futures. Suppose you hold Infosys Shares and are nervous about the share in the short run. You can consider Hedging.

Question: If I were nervous, would I not sell Infosys straight away?

Answer: Yes, you will if you believe that Infosys is moving down in the long run. But if your nervousness is temporary, then selling Infosys might be a bad solution. In the first place, after you sell, Infosys might move up. In most cases, investors find it difficult to buy the same share at a higher price. Practical evidence suggests that most investors are unable to acquire good shares once having sold them. The second common problem is that of capital gains. If your cost is much lower than today's price, you might have to pay capital gains taxes on sale of your shares.

Question: What is the alternative?

Answers: Hold on to your Infosys shares and sell Infosys futures instead. As a result, you will have a covered position (no profit no loss) for the period of time covered by futures. For example, if you sell one month Futures, you are covered for one month. If Infosys is quoting at Rs 4,000 and you sold Infosys (one month) Futures for Rs 4,060, you have – one – hedged your position for one month – and – two – made a profit of Rs 60. It does not matter whether Infosys moves up or down.

Question: If it moves up, I would have made a profit?

Answer: Yes, had you not hedged your position, you would have made a profit. However, you have lost that profit now. Remember, a hedge is not a device to maximize profits. It is a device to minimize losses. As they say, a hedge does not result in a better outcome; it results in a more predictable outcome.

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STEP-3

Options - The basic framework

Question: What are Options?

Answer: Options are derivative products which, if you buy, give you certain rights.

Question: What kind of rights?

Answer: Call Options give you a right to buy a share (at a certain specific price), while Put Options give you a right to sell (again at a predefined price). For example, if you buy a Satyam 240 Call Option, you are entitled to buy Satyam shares at a price of Rs 240 per share. This specific price is called as the strike price or the exercise price.

Question: What do I pay for obtaining such rights?

Answer: The cost you pay for obtaining such rights is the premium (also called price or option value). In the above case, if you had paid Rs 20 for the Option, that would be the premium.

Question: So do I actually get Satyam shares?

Answer: Most of the time, you do not even intend to buy Satyam shares. The option itself has a value that keeps fluctuating with the price of Satyam shares. For example the Satyam share price may have been Rs 242 when you bought the Call Option.

You expect Satyam price to rise. You accordingly bought the Call (instead of Satyam itself). Now if Satyam rises to Rs 270 (in 10 days time), you will find that that the Call would also have raised in price from Rs 20 to Rs 35. In that case, you would simply sell the Call for Rs 35. You would have made a profit of Rs 15 on the Call itself without getting into Satyam shares themselves.

You can get Satyam shares (through the Call) if you want to, but that we will discuss later.

Question: So when should I buy a Call?

Answer: You should buy a Call when you are bullish.

Question: Why should I not buy the share itself?

Answer: Well, you can. But in Options you will earn more. Take the above case. If you buy Satyam shares at Rs 242 and sell Satyam at Rs 270, you will make a profit of Rs 28, a 12% return. Now if buy the Option at Rs 20 and sell at Rs 35, you have earned 75% return.

Your view is on Satyam in both cases, for the same period of time and you earn far more in Options.

Question: What if my view is not correct?

Answer: Here again, Options are very useful. If your view is wrong, you will find that your Option value will decrease, as Satyam share price decreases. For example, you will find that the Option value is only Rs 10 if Satyam drops to Rs 225. In that case, you will sell off the Option at Rs 10 and bear the loss.

If you had bought Satyam, you would have lost Rs 17 per share, while here you lose only Rs 10. It is however higher in percentage terms.

If Satyam drops all the way to Rs 200, you will find that your Option carries virtually no value. Here again, you would have lost Rs 42 per share in Satyam. But in Options, your maximum loss will be Rs 20, i.e. the amount you paid for buying the Option.

The biggest advantage of Options is that your maximum loss is limited to the Option Price you paid. Hence, you have limited losses but unlimited profits as a buyer of Options.

The accompanying graph is very useful in understanding the profit / loss possibilities of an Option. The X-axis shows the price of Satyam and the Y-axis indicates the profits or losses you will make.

How can I enjoy such a wonderful profile of limited losses and unlimited profits? I mean, somebody must be paying for this, isn't it?

Well, you are right. That somebody paying for this is the Option Seller (also called the Option Writer).

Question: Why does he pay for unlimited losses?

Answer: The Option Writer is usually a skilled market player with an in-depth knowledge of the market. He is willing to take unlimited risk in return for a limited profit. The premium you pay is his limited income, but if his view is wrong, he will pay you for the unlimited profits you might make.

In the above case, if Satyam share price rises the Option Seller will lose Rs 15 (he would have sold you the Option at Rs 20 only to buy it back at Rs 35). If Satyam rises further, the Option value will also rise and his losses will be that much higher.

Question: When will the Option expire and what happens on expiry?

Answer: Options will (like Futures) expire on the last Thursday of every month. On expiry, your Call Option will be settled based on the closing price of Satyam. For example, if Satyam share price was Rs 281 on the last Thursday, you will be paid Rs 41, i.e. the difference between Rs 281 and your strike price of Rs 240.

Your net profit will be Rs 21, i.e. Rs 41 that you receive on expiry less the Rs 20 premium that you paid for purchasing the Option.

Question: Who will pay this difference of Rs 41?

Answer: The Option Seller/Writer will pay this difference of Rs 41 to the exchange which will pay your broker who will pay you.

This settlement is called automatic exercise of the Option.

Question: What if the price of Satyam on the last Thursday is below Rs 240?

Answer: If Satyam closes at say Rs 237, you will receive nothing. In that case, your loss will be Rs 20 (your premium) which the Option Seller would have earned as his income.

Question: Can I also exercise before the expiry date?

Answer: In case of stock Options (31 stocks currently), you can exercise your Option on any trading day. You will receive the difference (if you are holding a Call Option) between the closing price and your strike price. Such Options which can be exercised at any time are called American style Options.

In case of index Options (2 indices currently), you can exercise only on the last day. These are called European style Options.

Question: Are American style Options more useful / flexible?

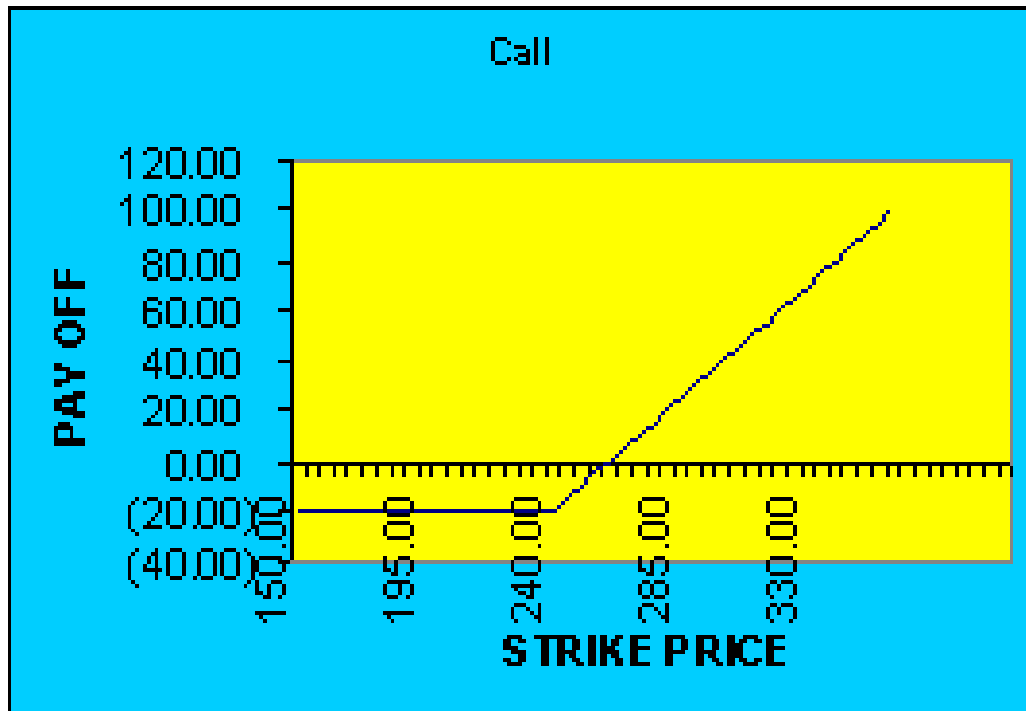
Answer: Yes, but only partly. The advantage of anytime exercise is useful for Option buyers. However, in practice, exercise is rare. You will find that it is more profitable to sell an Option (having bought it earlier) rather than exercise.

You will often receive more by sale than by exercise. If you are waiting in the Ground Floor of a building and want to go to the 21st floor, you have two Options – one – take a lift and – two – take the stairs. Which will you prefer? Obviously the lift. In a similar manner, having bought an Option, you can exit in two ways – one – sell the Option and – two – exercise the Option. More than 95% of buyers will sell the Option.

Question: So when should I exercise?

Answer: You will take the stairs only when the lift is not working. In a similar manner, you will exercise the Option only when the sale possibility is not working. If the market is illiquid and you find that there are no trades happening, you may try to exit through the exercise route.

Graph



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STEP-4 **How do I use put options?**

Question: How do I use Put Options?

Answer: You would, in most circumstances, think of buying Put Options when you are bearish about scrip. For example, if Satyam is currently quoting at Rs 262 and you are bearish about Satyam, you would buy a Put.

Question: What would happen when I buy a Put?

Answer: You would first decide a certain strike price, say Rs 260. It would carry a premium as quoted in the market, say Rs 11. When you buy this Put, it gives you a right to sell Satyam at the strike price of Rs 260. Thus, if Satyam were to go down to Rs 235 at expiry time, you can still sell Satyam at Rs 260 (your strike price).

Question: Do I need to have Satyam with me in the first place?

Answer: At the moment, transactions in Options are cash settled. Hence, you do not need to possess Satyam to buy Satyam Puts.

Question: What is the meaning of Cash settled?

Answer: Cash settled means the difference between the strike price (Rs 260) and the market price on expiry (Rs 235) will be paid to you. In this case, you would earn Rs 25 per unit. As you are aware, the lot size for Satyam is 1,200. Hence, you would earn Rs 30,000 on expiry. After deducting the premium of Rs 11 per unit (i.e. Rs 13,200), your net profit will be Rs 16,800.

The cash settlement process applies to calls as well.

Question: Is there any other kind of settlement?

Answer: Yes. There is delivery based settlement, which is expected to be introduced in India in the next 3 to 4 months. In that case, you, as a Put buyer, have to deliver Satyam on the day of expiry and you would be paid Rs 260 per share. Thus you would effectively make a profit of the same Rs 25 per share.

The physical settlement system would apply to calls as well. As a buyer of a call, you would pay the strike price and would get shares delivered to you at the strike price.

Question: What are Index Puts?

Answer: You would use Index Puts when you are bearish about the market as a whole. Thus you would buy Nifty Puts or Sensex Puts and if the market actually moves down, you can pocket the difference.

Question :How would these be settled?

Answer :Index Options (both Calls and Puts) will always be cash settled. Physical settlement of the index itself is impractical.

Question :How else can I use Put Options?

Answer :Apart from buying Puts on the basis of a bearish view, you can view puts as Insurance on shares. If you are already holding Satyam and you are nervous about Satyam in the short run, you should consider buying Puts on Satyam.

Question :I could sell the shares also?

Answer :Yes, you can sell the shares. But in many cases, your view could be wrong and you may find Satyam has actually up instead of down. In that case, having sold off Satyam, most people never buy it back at a higher price.

Secondly, there could be capital gains on such transactions.

Question :What happens if buy these Puts?

Answer :If Satyam goes down (as per your belief), you will find that your Put will generate a profit. This profit will compensate for your losses on Satyam. Let us take an example. The current price of Satyam is Rs 262 and you bought a 260 Put paying a premium of Rs 11. Satyam actually goes down to Rs 235.

You will make a loss of Rs 27 on Satyam shares and a profit of Rs 25 on Puts. Thus the net loss will be Rs 2. Adding the premium also, the total loss is Rs 13.

If Satyam actually goes up to say Rs 300, you will forget about the Put and write off the loss of Rs 11 on premium. In fact, you might even sell the Put at some low price of Rs 2 or so reducing your losses partly.

This strategy is called is 'put hedge'.

Question :Which Puts should I buy?

Answer :At any point, several Puts will be quoted. You might find Satyam 300 Puts, Satyam 280 Puts, Satyam 260 Puts, Satyam 240 Puts and Satyam 220 Puts in the market. The higher strike prices will carry a heavy premium and the lower strikes will be cheaper.

If you buy lower strike Puts, your protection will start late. For example, if you buy a Satyam 220 put for Rs 3, you must be willing to bear losses till Satyam reaches Rs 220 (from the current level of Rs 262), i.e. Rs 42 per share.

If you buy a Satyam 300 Put (which might typically quote for Rs 50), your protection starts the moment Satyam quotes below Rs 300.

Question :So what should I do?

Answer :Consider this as a Medclaim Policy. You can go for a higher coverage at a higher premium or low coverage at a low premium.

You should ask yourself the following questions:

What is the probability of Satyam going down to that level?

How much loss am I willing to bear myself?

How much value for money do I see in the premium?

What if I hold shares other than the 31 Scrips on which derivatives are allowed?

If you hold other shares, you should consider buying Index Puts if you are nervous about them. You would pay a similar premium for protection and make some profits if the market moves down.

Question :How much of Index Puts should I buy?

Answer :This is slightly tedious and you need to understand how your portfolio moves vis-à-vis the market index (say Sensex). The relationship between the two is called 'beta'. Statistically the number is generally between 0 to 2. For example, if the beta of your portfolio is 1.2, it means your portfolio will move by 1.2 times the movement in the Sensex. If the Sensex were to move up by 10%, your portfolio will move up by 12%.

You should therefore work out the value of your portfolio and multiply it with the beta and buy Index Puts of that amount.

This will work out to be a good insurance.

There are more intricacies on Index Put insurance which institutions holding large equity volumes might consider, but for a retail investor, this strategy is generally good.

You should however note that your protection might not be as precise as in the case of individual stock Puts, as the past beta may not exactly match with future beta. You should, in my opinion, be happy if you are able to cover even 80% of your losses.

We have discussed Option Buying (Calls and Puts). In our next article, we will discuss Option selling which is high risk and more exotic.

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STEP-5 **Options writing**

Question :What is writing options all about?

Answer :A seller of Options is generally called as a Writer - in the initial days of Option Trading before the advent of computers, Option sellers wrote out a Contract and gave it to the Option buyers. Thus, the term Writers was coined and has stayed.
The writer of Options earns a limited profit (the premium), but can incur unlimited losses.

Question :What view does the Option writer have?

Answer :The writer of the Call Option is generally bearish while the writer of the Put Option is generally bullish.

Question :What is the payoff the Option writer faces?

Answer :Suppose you write a Satyam Rs. 280 call and earn a premium of Rs. 19. This is your income, which you will receive from your broker on the next day. You are bearish about Satyam. Suppose Satyam closes at Rs. 290, you will pay the difference of Rs. 10 (between market price and strike price) to the exchange. Your net profit will be Rs. 9.

If Satyam closes at Rs. 280 or below Rs. 280, you will be happy as your entire premium remains with you.

You should be careful to understand that if Satyam really moves up (say Rs. 330), you will have to pay the difference of Rs. 50, thus suffering a net loss of Rs. 31. Losses can be unlimited as Satyam can go to any level.

Question :What happens in case of Puts?

Answer :As a Put writer, you will again receive a premium income. Suppose you sell a Satyam Rs. 300 Put for a premium of Rs. 31 that is your income, which will be received on the next day. You are bullish about Satyam in this case.

If Satyam closes at Rs. 285, you will have to pay the difference of Rs. 15 (between strike price and market price) to the exchange. If Satyam closes at Rs. 300 or above Rs. 300, then you can retain your entire income of Rs. 31.

Again, you are exposed to severe losses. For example, if Satyam moves down to Rs. 230, you will have to pay a difference of Rs. 70, resulting in a Net Loss of Rs. 39.

Question :So if Option writing is so risky, why should anybody write Options?

Answer :There could be several aspects to this strategy. First, you might be sure of your view and hence do not mind generating an income from it. Secondly, unlimited losses might not actually happen in practice. For example, if you have sold the Satyam 280 Call (you are bearish) for Rs. 19 and Satyam actually starts moving up. You will become nervous. So what will you do?

You will buy back the Satyam call. It could have become more expensive (say Rs. 25). So, what you sold for Rs. 19, you will buy back at Rs. 25, making a loss of Rs. 6. That is not unlimited in practice.

Thirdly, most Option writers are more sophisticated players and will cover their unlimited risks by some other position. For example, they might sell one call and buy another call (bull or bear spread). They might sell a call and buy a future. They might sell a call and might the underlying shares. There could be more complex strategies.

Option Writing however requires:

- ☐ a higher degree of understanding,
- ☐ sophistication,
- ☐ risk management ability
- ☐ a very active presence in the market regularly.

Question :Do you earn more in Option Buying or Selling?

Answer :This question is really difficult to answer. It will be correct to say that Option Buyers who have unlimited profits do not always make these unlimited profits and Option Writers who face unlimited losses do not always make unlimited losses.

That stated, the frequency of profits and losses by each category of players is difficult to know or even judge. It is also wrong to say that individual investors will always buy calls and brokers/institutions would be writing calls all the time.

Question :What kind of margins are applicable on Options?

Answer :Option writers need to understand impact of margins clearly. Option buyers need to merely pay the Premium. No margins are applicable on Option buying. But Option writers face unlimited losses. Hence, the exchanges will levy margins on them. The Premium paid by Option buyers will be received in cash by Option writers. This settlement is effected on $t + 1$ basis. Thus, if you have written a Satyam Option for Rs 20 each, you will receive Rs 24,000 cash next day ($1,200 \times 20$).

However, the exchange will ask you to maintain a Margin for the possible losses that you might incur. The margining system currently adopted by India is a sophisticated mechanism based on SPAN software, a program developed by Chicago Mercantile Exchange. The program creates 16 imaginary scenarios for each option position (varying levels of price movements and volatility movements are considered) and the maximum possible loss that you might incur is taken as the margin amount to be paid by you.

In a later article, we will discuss in more detail, the intricate calculations of SPAN.

Question :In what form is the margin payable?

Answer :The margin can be paid to your broker in cash or cash equivalents or equity securities. Cash equivalents comprise Government securities, Debt securities, Bank guarantees, Fixed deposits and Treasury bills. If the amount of margin falls short due to the SPAN demand being higher, the balance margin can also be brought in by you in any of these forms.

For ease of calculation, you, as an Option writer should be prepared to bring in margins of around 20% to 40% of the Notional Contract Value.

Question :What is Notional Contract Value?

Answer :If we use our Satyam example, a Satyam 300 Put is sold for Rs 31. The lot size is 1,200 shares. The Notional Contract Value is $\text{Rs } 31 \times 1,200 = \text{Rs } 3,72,000$. The margins are calculated on this amount.

Question :Are Margins steep?

Answer :No, the margins are levied on a scientific basis and if the volatility of the underlying is high, the margins will also turn out to be high. It is important to have a clear and scientific methodology for margining, as exchanges and the market as a whole will be able to function smoothly only if the margining system is proper. The US has experimented with various systems since 1973 before accepting the SPAN system as a sophisticated and scientific system. We are lucky in India not to go through all their pains and get a ready made system in the first place.

Question :What should I consider as the cost of margins?

Answer :In my opinion, if you hand over your Fixed Deposits to your broker, this will only be marked as a lien in your account. You will continue to hold the Fixed Deposit in your name and will continue to earn interest income there from. In such a situation, there is no real cost you incur.

If you obtain a Bank Guarantee, the only cost you really incur is the bank commission on the guarantee. In a similar manner, if you mark a pledge on equity securities, your effective cost is zero. Thus, though margins may be high, your effective cost is negligible. Obviously, in the event of default, your cost will be high, but that is not attributable to the margining system.

Question :What is the brokerage I will pay on derivative transactions?

Answer :As per current market practice, the brokerage charged varies between 5 paise per Rs 100 to 10 paise per Rs 100. An average derivative transaction is around Rs 2 lakhs. Accordingly, the brokerage per transaction comes to around Rs 100 to Rs 200. The percentage should be applied on the Notional Contract Value which was defined earlier in this article.

In the next article, we will discuss the intricacies of Option Strategies.

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STEP-6 Option Valuation

Question :What are the components of Option Value?

Answer :The value of an Option is made up of two components, viz. Intrinsic Value and Time Value.

Question :What is Intrinsic Value?

Answer :The value that you will realize (as a buyer of an Option) on expiry or on exercise is the Intrinsic Value. For example, the Intrinsic Value of a Satyam 280 Call is Rs 11 when the Satyam share itself is quoting at Rs 291. You will realize Rs 11 if you exercise today.

Question :What is Time Value?

Answer :Time Value is the Total Option Value minus Intrinsic Value. For example, if the Satyam 280 Call above is quoting at Rs 25, Time Value will be Rs 25 minus Rs 11 i.e. Rs 14.

Question :How does Intrinsic Value correlate with Share Price?

Answer :In the case of Call Options, higher the Share Price, higher the Intrinsic Value. For example, if Satyam moves up from Rs 291 to Rs 301, the Intrinsic Value has moved up from Rs 11 to Rs 21. There is thus absolute correlation between the two. Obviously, if the Satyam share price moves down, the Intrinsic Value will move down to the same extent.

In the case of Puts, the correlation is absolutely negative. If Reliance is quoting at Rs 300, the Intrinsic Value of a Reliance 320 Put is Rs 20. If Reliance thereafter moves down from Rs 300 to Rs 295, the Intrinsic Value of the Reliance 320 Put will increase from Rs 20 to Rs 25.

Question :How does Time Value correlate with Share Price?

Answer :Time Value does not correlate with Share Price. It correlates with other factors, the principal ones being - Time left for Expiry and Volatility. If Time left for Expiry is high, the Time Value will be higher and vice versa. You will find, for example, that the Reliance 300 Feb Call Option will be cheaper than the Reliance 300 March Call Option. This is because, the March Options will have one more month to expire than the Feb Options.

Interestingly, Time left to expiry affects both Calls and Puts equally. Thus, long term Calls and Puts are priced more than short term Calls and Puts.

Volatility is a very interesting determining factor of Option Value. Higher the Volatility of the share, higher will be the values of both Calls and Puts. This is because, the probability of a highly volatile share moving up or down is much higher than that of a low volatile share. Option values are based on how much movement is possible or expected in the underlying share and higher this possible movement, higher the value of the Option.

Question : Can we summaries the factors determining Option Values?

Answer :

Factor	Option Type	Impact on Option Value	Component of Option Value
Share price moves up	Call Option	Option Value will also move up	Intrinsic Value
Share price moves down	Call Option	Option Value will move down	Intrinsic Value
Share price moves up	Put Option	Option Value will move down	Intrinsic Value
Share prices moves down	Put Option	Option Value will move up	Intrinsic Value
Time to expire is high	Call Option	Option Value will be high	Time Value
Time to expire is low	Call Option	Option Value will be low	Time Value
Time to expire is high	Put Option	Option Value will be high	Time Value
Time to expire is low	Put Option	Option Value will be low	Time Value
Volatility is high	Call Option	Option Value will be high	Time Value
Volatility is low	Call Option	Option Value will be low	Time Value
Volatility is high	Put Option	Option Value will be high	Time Value
Volatility is low	Put Option	Option Value will be high	Time Value

Question : Are there other factors determining Option Values?

Answer : Two other factors which affect Option Values are Interest rates in the economy and Dividends on stocks. These do not affect Option Values significantly. It is expected that higher Interest rates will result in higher Call Option Values and lower Put Option Values. Dividends have the impact of decreasing share prices. Accordingly, Call Option Values will decrease and Put Option Values will increase when Dividends are declared.

Question : How do I know whether a particular Option is correctly priced in the market or not?

Answer : There is a popular Black Scholes Model which provides the theoretical price of Options. Black Scholes Option Calculators are available on various websites. You need to key in the basic parameters which are the following:

- Current Share Price
- Option Strike Price
- Time left for Expiry
- Volatility
- Interest Rate

Given this data, the calculator will provide you with the price. You can then compare this price with the actual price prevailing in the market and find out whether the Option is being overpriced or under priced.

Question : Will I face any practical difficulty in this process?

Answer :Yes – you will. You will be able to key in all the above parameters into the Option Calculator except Volatility. This is not clearly known all the time. Further, Volatility can be understood and defined differently by different people. You need to understand Volatility well in order to determine Option Value correctly.

The other factors are clearly known – viz. the Current Share Price, Option Strike Price, Time left for Expiry are frozen anyway. Interest rate estimates can differ from person to person, but Interest rates do not affect Option Values very much, hence this does not matter.

Question :Are there other models also available?

Answer :Yes, there are other models apart from the Black Scholes model. The popular ones are the Binomial Model developed by Cox, Ross and Rubinstein and the Adison Whaley Model. These are slightly more sophisticated than the Black Scholes Model. However, the Option Values are not significantly different. For example, if one Model gives you a Value of Rs 14.12, another might come up with a Value of Rs 14.26. As a retail buyer of Options, you might find that the difference between the bid and the ask at any point of time is probably higher than the differences between Option Values of various Models.

Question :How do I learn about Volatility?

Answer :We will discuss that in our next Article.

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STEP-7 **Volatility - Significance for options Part-I**

Question :Why is Volatility significant for Options?

Answer :The value of an Option, apart from other factors, depends upon the Volatility of the underlying. Higher the Volatility of the underlying, higher the Option Premium.

Question :What is Volatility?

Answer :Volatility is the fluctuation in the price of the underlying. For example, the movement in the price of Satyam is quite high as compared to the Sensex. Thus, Satyam is more volatile than the Sensex.

Question :How do you measure Volatility?

Answer :Volatility is the standard deviation of the daily returns on any underlying.

Question :This is too complicated ! What is Daily Return?

Answer :Ok – let me restate in simple language. Every day, every scrip moves up or down by a certain percentage. For example, if Satyam closed at Rs 280 yesterday and today it closed at Rs 285, the percentage change is $5/280 \times 100 = +1.79\%$. This percentage is called 'daily return'.

Let me make a slightly elaborate calculation and show you.

Day	Satyam Closing Prices	Daily Return
1	280	
2	285	+1.79%
3	272	-4.56%
4	292	+7.33%
5	287	-1.71%

Fine, what next?

Now you find out the standard deviation of these Daily Returns.

Question :What is Standard Deviation?

Answer :Standard deviation is a measure of dispersion and comes from statistics. Dispersion indicates how widely 'dispersed' a set of data is. For example, if you look at heights of adult males in India, you will find that the heights of various people are not too far off from each other. While the average male is about five and a half feet tall, the others are not too far off. While some may be one feet above this average, others might be one feet below.

You are unlikely to find people twenty feet tall, nor two feet tall. Thus, if you were to work out the Standard Deviation of this data, this figure will be a small number, because the data is not too dispersed.

On the other hand, if you try and plot the wealth of various Indian males, you might find a wide dispersion, as somebody might have a wealth of Rs 100 while somebody else might possess Rs 1 crore. Thus, standard deviation of wealth will be high.

Question :How is it calculated?

Answer :In these days of computerized living, it might be simpler to use an Excel spreadsheet and key in the formula for standard deviation. You will get the figure in a second. The technical formula goes like this:

Identify the basic data (in our case the percentage daily returns)

Work out the average

Work out the deviations of each observation from the average (these deviations might be positive or negative)

Take a square of these deviations

Sum up these squares

Divide the sum by the number of observations

Work out the square root of this number

Let me show you from the above example:

Day	Daily Return	Deviation	Square of Deviation
2	+1.79%	+1.08%	0.011664%
3	-4.56%	-5.27%	0.277729%
4	+7.33%	+6.62%	0.438244%
5	-1.71%	-2.42%	0.058564%
Average	+0.71%	Sum	0.786201%

Divide the sum by the number of observations: 0.1966%

Square root of above: 4.43%

Thus the standard deviation of the above data comes to 4.43%.

This is the daily standard deviation, as it is based on daily returns data.

I have heard that Volatility is 50%, 80% etc. Your volatility is far lower at only 4%.

You have heard correct. What we have calculated above is the Daily Volatility. If you want to know the Annual Volatility, you should multiply with the square root of the number of working days in a year. For example, if one year has 256 working days, square root of 256 days is 16 days. Thus in the above case the Annual Volatility is $4.43\% \times 16 = 70.88\%$.

In a similar manner, if you want to know the Volatility of the next 9 days, the 9-day Volatility will be $4.43\% \times 3 = 13.29\%$.

Question :Having derived the Volatility, how do I interpret it?

Answer :The concept of Normal Distribution states that you can derive a deep understanding of possible movements in the share price from this figure of Volatility. The movement will be within 1 standard deviation 66% of the time, within 2 standard deviations 95% of the time and within 3 standard deviations 99% of the time.

Question :Can you elaborate using examples?

Answer :If Satyam's closing price today is Rs 287, expected movement in the next one day can be tabulated as under:

Number of Standard Deviations	Percentage	Price Movement	Lower Price	Higher Price	Probability
One	4.43%	13	274	300	66%
Two	8.86%	26	261	313	95%
Three	13.29%	38	325	249	99%

Similarly possible movement over the next nine days can be forecasted as under:

Number of Standard Deviations	Percentage	Price Movement	Lower Price	Higher Price	Probability
One	13.29%	38	325	249	66%
Two	26.58%	76	211	363	95%
Three	39.87%	114	173	401	99%

Question :What are we predicting here?

Answer :Predicting is a rather difficult science. First of all, we are not looking at direction at all. We are not saying whether Satyam will move up or down. Secondly, we are forecasting possible maximum swing in magnitude irrespective of direction.

For example, we are saying that Satyam will close between Rs 249 to Rs 325 tomorrow and the probability of this happening is 99%. The implication is that the probability of Satyam closing below Rs 249 or above Rs 325 is 1%.

Question :How many days of data should we consider for calculating Volatility?

Answer :There is a difference of opinion among traders as to the number of days that should be considered. In the Indian context, we currently find that Options are available for 3 months. However, most of the trading happens in the first month. Thus, the relevant period for forecasting is one month or lower. Accordingly, it would be sensible to consider Volatility based on the past 10 trading days and for the past 20 trading days. Longer periods would perhaps not be relevant in the present context.

Question :How do we use Volatility in our trading strategies?

Answer :We will discuss this in our next column.

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STEP-8 **Volatility - Significance for options Part-II**

Question :Can we summarize our discussion last time?

Answer :In our last Article, we discussed the concept of Volatility, how is it calculated, how is it interpreted and what period of time should be reckoned for such calculations.

Question :How can these learning be applied?

Answer :Study of past prices of a scrip will enable you to arrive at 'historical' volatility. Option prices as you are aware, depend on Volatility to a high degree. However, Option prices may or may not reflect 'historical' volatility.

Study of past prices of a scrip will enable you to arrive at 'historical' volatility. Option prices as you are aware, depend on Volatility to a high degree. However, Option prices may or may not reflect 'historical' volatility.

Question :Why not?

Answer :It is possible that market participants believe that Volatility in future is expected to rise. Thus, historical Volatility may have been 50%, but it is widely believed that the scrip will become more Volatility resulting in a higher level of say 60%. Accordingly, the Option might be priced on the basis of 60% forecasted Volatility.

Question :How will I know this?

Answer :If you study the price of the Option as actually quoted in the market, you will realize what the 'implied' Volatility is. For example, if the following Option is theoretically studied:

Stock Price Rs 280

Strike Price Rs 260

Volatility 50% annual

Days to Expiry 20 days

Interest Rate 12% annual

The price of the Option applying Black-Scholes Model comes to Rs 26.28. But the actual price of that Option in the market might be (say) Rs 29.50.

Question :What does this imply?

Answer :This could imply that the market is not going by the historical Volatility of 50%, but is imputing another Volatility to that Option going forward. You can use the same calculator, but now instead of providing the Volatility figure yourself, you can provide the Option price instead. Now if you work backwards and find out what is the Volatility that would support the price of Rs 29.50 that Volatility comes to 65%.

Question :So how can I use this understanding?

Answer :You are facing a situation where historical Volatility of the scrip is 50%, but the implied Volatility is 65%. Various possibilities for this divergence can emerge. One possibility is that the market is expecting the future Volatility of the scrip to increase and is accordingly factoring in such expectations. Another possibility is that the market is mis-pricing the Option and that the Option value will come back to around Rs 26.28 shortly. The third possibility could be that there is some news about the company that could affect the price favorably and this news is being reflected in the Options become more expensive to begin with and in a short time, the underlying scrip will also reflect this phenomenon.

Depending on what you see from these possibilities (and there could be others too), you could take an appropriate stand.

For example, if you believe that Volatility will rise, you could go in for Option Strategies that could suit such an event happening. If you believe that the Option is being mispriced, as an aggressive player, you could sell such Options with a belief that you could buy them back at a later date. Such a strategy would need to be supported by a hedging strategy as mere selling of Options will leave with unlimited risk.

If you believe that there is some positive 'news', you might be tempted to buy the Options in spite of high Volatility (or buy the underlying).

Question :What if the Implied Volatility is lower than Historical Volatility?

Answer :This is also possible. It could indicate that the Option itself is being under priced in the market (which could make it a good buy on its own merit). It could indicate that the market believes that the days of high Volatility in that scrip are over and it will now trade a lower level. Another possibility is that there is some bad news whereby the underlying stock price is expected to move down and the Option has first started reflecting this possibility.

Question :What should I do to fine tune my understanding?

Answer :If you are a serious derivatives market player, you should track historical Volatility very closely. It is recommended that you work out 10 day and 20 day moving Volatilities on a continuous basis. A moving daily trend would be very useful.

Once you have this set of numbers, you could compare with Implied Volatility to arrive at a more definitive conclusion. For example, you could find the following information:

10 day Volatility Today (of last 10 days) : 61%

20 day Volatility Today (of last 20 days) : 57%

Max 10 day Volatility in the last 6 months : 62%

Max 20 day Volatility in the last 6 months : 59%

Implied Volatility Today : 71%

This set of data reveals that the current Implied Volatility is way beyond historical levels and the likelihood of some positive news in the scrip is probable. If you plan to sell the Option on the assumption that it is overpriced, that strategy is dangerous and should be dropped.

On the other hand, if the data shows up as under:

10 day Volatility Today (of last 10 days) : 51%

20 day Volatility Today (of last 20 days) : 47%

Max 10 day Volatility in the last 6 months : 72%

Max 20 day Volatility in the last 6 months : 67%

Implied Volatility Today : 61%

This would indicate the possible overpricing of the Option at current levels, but as the Implied Volatility is within the maximum levels reached in the recent past, there does not appear to be abnormal behaviour in the price. Advanced players could consider selling such Options which have a 'statistical edge' and if necessary covering the position with some other Option or Future. Selling such Options needs further discussion, which we will try and explore in later articles in this series.

If you are anyway considering selling the Option (for reasons other than Volatility reasons enumerated here), you could think that this is an appropriate time for selling the Option as the edge will help you in increasing your profit to a small degree.

Question :How much does Volatility affect an Option's price?

Answer :It does affect the price quite significantly. Some examples are provided below:

Days to expiry : 30 days

Interest Rate : 12% per annum

At The Money Option :

Stock Price : 260

Strike Price : 260

Volatility Annualized	Option Price
50%	16.09
60%	19.03
70%	21.98
80%	24.92

In the Money Option :

Stock Price : 300

Strike Price : 260

Volatility Annualized	Option Price
50%	45.46
60%	47.44
70%	49.69
80%	52.14

Out of the Money Option:

Stock Price : 240

Strike Price : 260

Volatility Annualized	Option Price
50%	7.15
60%	9.72
70%	12.35
80%	15.03

You can see that the price of the Option is significantly affected in all three types of Options.

Question :What are the Advanced applications of Volatility trading?

Answer :Volatility trading is a subject in itself. Strategies like delta neutral and gamma neutral fall within its ambit. We will discuss them after understanding basic strategies.

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STEP-9 **Bull Spreads**

Question :What are Bull Spreads?

Answer :Simple option positions carry unlimited profits, limited losses for buyers and limited profits, unlimited losses for sellers (writers). Spreads create a limited profit, limited loss profile for users. By limiting losses, you are limiting your risks and by limiting profits, you are reducing your costs.

Those spreads which will generate gains in a bullish market are bull spreads.

Question :How is a Bull Spread created?

Answer :You can create a Bull Spread by using two Calls or two Puts. If you are using Calls, you should buy a Call with a lower strike price and sell another Call with a higher strike price.

Example:

Call	Strike Price	Premium	Pay/Receive
Satyam May – Buy	260	24	Pay
Satyam May – Sell	300	5	Receive
Net		19	Pay

Question :When would I enter into a Bull Spread like the above?

Answer :You are bullish on Satyam which is currently quoted around Rs 260. You believe it will rise during the month of May. However, you do not foresee Satyam rising beyond Rs 300 in that period.

If you simply buy a call with a Strike Price of Rs 260, the premium of Rs 24 that you are paying is for unlimited possible gains which include the possibility of Satyam moving beyond Rs 300 also. However, if you believe that Satyam will not move beyond Rs 300, why should you pay a premium for this upward move?

You might therefore decide to sell a call with a Strike Price of Rs 300. By selling this call, you earn a premium of Rs 5. You are sacrificing any gains beyond Rs 300. The gain on the 260 strike call which you bought will be offset by the loss on the 300 strike call which you are now selling.

Thus, above Rs 300 you will not gain anything.

Question :What will be my overall payoff profile?

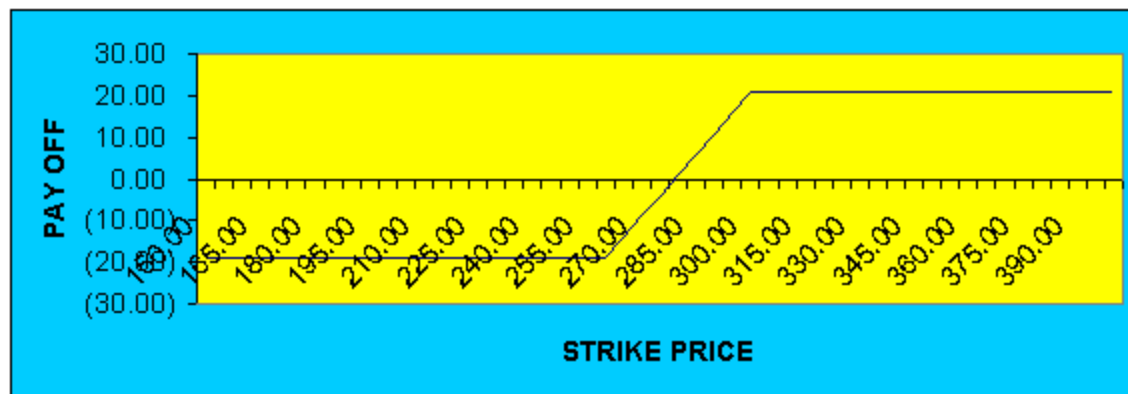
Answer :Your maximum loss is Rs 19 i.e. the net premium you paid while entering into the bull spread. Your maximum receivable from the position on a gross basis is Rs 40 i.e. the difference between the two strike prices. Thus, your maximum net profit is Rs 21 (Rs 40 minus Rs 19).

Various closing prices (on the expiry day) will result in various payoffs shown in the following table:

Closing Price	Profit on 260 Strike Call (Gross)	Profit on 300 Strike Call (Gross)	Premium paid on Day One	Net Profit
250	0	0	19	-19
255	0	0	19	-19
260	0	0	19	-19
270	10	0	19	-9
279	19	0	19	0
290	30	0	19	11
300	40	0	19	21
310	50	-10	19	21

You can observe from the above table that your maximum loss of Rs 19 will arise if Satyam closes at Rs 260 or below (i.e. the lower strike price) and the maximum profit of Rs 21 will arise if Satyam closes at Rs 300 or above (i.e. the higher strike price).

The payoff graph of the above bull spread will appear like this:



Question :How does the Bull Spread work when I use Put Options?

Answer :Interestingly, the Bull Spread logic remains the same. You buy a Put Option with a lower strike price and sell another one with a higher strike price. In this case however, the Put Option with the lower strike price will carry a higher premium than that with the higher strike price.

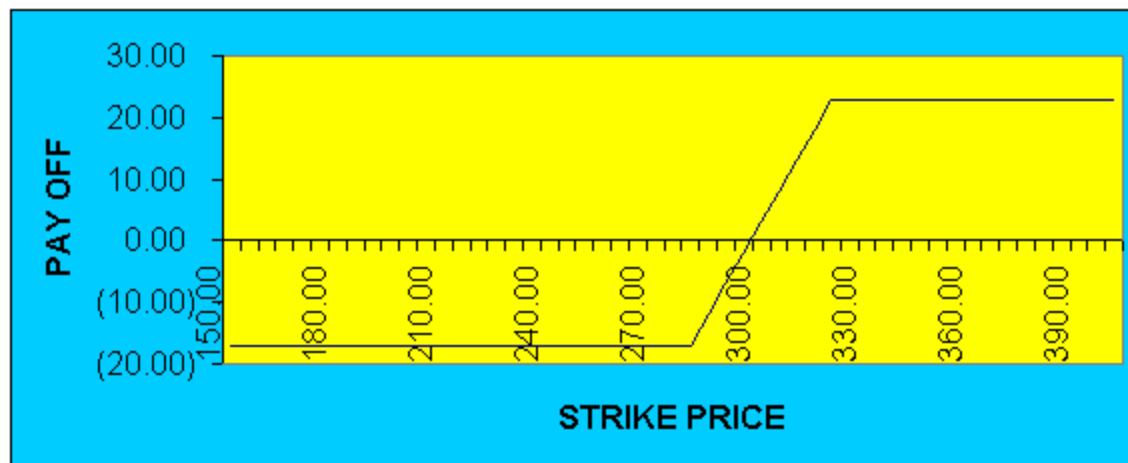
For example, if you buy a Reliance Put Option Strike 280 for Rs 24 and sell another Reliance Put Option Strike Rs 320 for Rs 47, this would be a Bull Spread using Puts.

On Day One, you will receive Rs 23 (Rs 47 minus Rs 24). Your maximum profit is this amount of Rs 23 which will be realized if Reliance closes above Rs 320 (your higher strike price). Your maximum loss will be Rs 17 and will arise if Reliance closes below Rs 280 (your lower strike price). In this case, you will be required to pay Rs 40 on closing out of the position. The payout of Rs 40 minus the Option Premium Earned of Rs 23 will result in a loss of Rs 17.

The payoff profile as well as the graph will look very similar in character and are provided below:

Closing Price	Profit on 280 Strike Put (Gross)	Profit on 320 Strike Put (Gross)	Premium Recd on Day One	Net Profit
250	30	-70	23	-17
270	10	-50	23	-17
280	0	-40	23	-17
297	0	-23	23	0
320	0	0	23	23
330	0	0	23	23
340	0	0	23	23
350	0	0	23	23

The graph of the position will appear as under:



Question :How many Bull Spreads can be created on one scrip?

Answer :There are a minimum of 5 strike prices available. On volatile scrips, the number of strike prices are around 7 on an average. There are 7 Calls and 7 Puts on each scrip. You can create several spreads. On Calls alone, you combine Strike 1 with Strike 2, Strike 1 with Strike 3 and so on.

The number of spreads no Calls will be 21 and a similar number on Puts. Thus, there are 42 spreads on one scrip in one month series alone.

Question :What factors should I consider while looking at Bull Spreads?

Answer :The most important factor would be your opinion of the range of prices over which the scrip is expected to sell in the period of reckoning. If you believe that:

You are bullish

You expect Satyam to quote above Rs 260

You do not expect Satyam to move up beyond Rs 300

Then the best spread available to you is the 260-300 bull spread.

You also need to consider the liquidity of the two options being traded. It is possible that options far away from the current price may not be traded heavily and you might find it difficult to get two-way quotes on them. In that case, it would be preferable to reduce the spread difference and trade on more liquid options.

Question :What is the difference between Bull Spreads created using Calls and Puts?

Answer :In terms of payoff profile, there is no difference. In terms of Premium, in the case of Call Options, you need to pay the difference in Premium on Day One and you will receive your profits on the square up day. Thus, the Call Spread is also called as a Debit Spread.

In the case of Put based Bull Spreads, you will receive a Premium on Day One and might be required to pay up later. These are called Credit Spreads.

It would appear likely that margins on Call based Bull Spreads will be far lower than that on Put based Bull Spreads as the possibility of losses in Call based Bull Spreads is negligible having paid the differential premium upfront. However, in case of Put based Bull Spreads, the loss is yet to be paid.

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STEP-10 **More on bull spreads**

Question :Can you summarize our discussion last time?

Answer :We discussed bull spreads last time. We understood that bull spreads can help you create position which offer limited reward but carry limited risk. We saw that you can create bull spreads using two calls or two puts. In the case of calls, you would buy a call with a lower strike and sell another call with a higher strike. You would operate in the same way with puts, buying a put with a lower strike and selling another with a higher one.

Question :What more do we need to know about bull spreads?

Answer :You can combine your views about the market along with the level of volatility you see in the markets to fine tune your bull spread strategies. Let us discuss some possible fine tuned strategies in this Article.

First of all, we presume that you foresee bullish markets and hence are looking at bull spreads as a possible strategy. Now, you can observe volatility of the scrip (or the index) and observe two possible volatility levels – low implied volatility or high implied volatility.

To recall, implied volatility is the one that is implied in the price that the option is currently quoting at. For example, if a Satyam option strike Rs 260, current market price Rs 260 with 15 days to go is quoting at Rs 15, the implied volatility (using the Black Scholes calculator) is 69%.

Whether this implied volatility is low or high depends on the historical volatility which Satyam has depicted in the past.

Question :How can I combine volatility with bull spread strategies?

Answer :As we discussed last time, if Satyam has 7 strike prices available, you can create as many as 21 bull spreads using calls and a further 21 bull spreads using puts. Mathematically, you can combine Strike Price 1 with Strike Price 2, and so on create six possible bull spreads using Strike Price 1. You can create 5 possible spreads using Strike Price 2 and then 4, 3, 2 and 1 spreads using Strike Prices 3, 4, 5 and 6 respectively. The total of $1+2+3+4+5+6 = 21$.

If you see low implied volatilities, you should buy the At the Money (ATM) option and sell an Out of the Money (OTM) option. You can also create a similar position using puts. In this case, you should buy ATM and sell In the Money (ITM).

For example, if Satyam is currently quoting at Rs 260, you could buy the Satyam 260 Call and sell Satyam 300 Call. You could even sell the Satyam 280 Call if you believe Satyam is not expected to rise much above 280.

At low implied volatilities, you might find that the ATM call is reasonably priced and you can afford to buy the call. The OTM call will also be reasonably priced which you can sell to reduce your net cost of the option.

With Satyam moving up, both Call Option prices will move up, but the ATM Call Option will move up more (in value) than the OTM Call, generating a net profit on the position.

Question :What if I see high implied volatilities?

Answer :If you see high implied volatilities, you should buy an In the Money (ITM) Call and sell an ATM Call. You will find that both the calls are expensive, but the ATM will be in most circumstances more expensive than the others. Thus, by selling the ATM Call, you can realize a good price.

With Satyam moving up, both Call Options prices will move up. The ITM Call will move up more (in value) than the ATM which will generate a profit for you on a net basis.

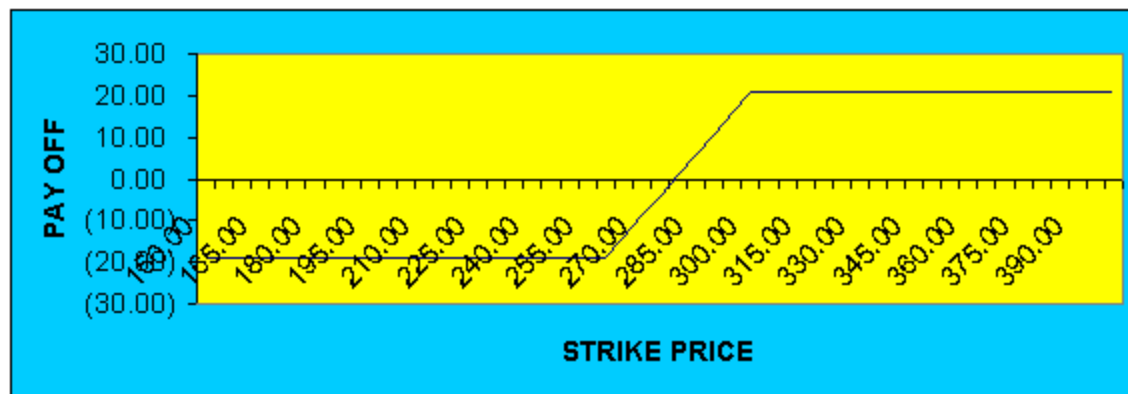
If you are using Put Options, you should buy an OTM Put and sell an ATM Put. The profit profile will be similar to that using Calls.

Question :What are the possible pitfalls using Bull Spreads?

Answer :You can be sometimes disappointed using Spreads, as they might refuse to move up (in terms of net profit) even though the underlying scrip (or index) has moved up as per

your expectations. The payoff that the Bull Spread offers as the diagram is the payoff at expiry.

Let us look at the payoff carefully – the diagram and the table are provided below.



Closing Price	Profit on 260 Strike Call (Gross)	Profit on 300 Strike Call (Gross)	Premium paid on Day One	Net Profit
250	0	0	19	-19
255	0	0	19	-19
260	0	0	19	-19
270	10	0	19	-9
279	19	0	19	0
290	30	0	19	11
300	40	0	19	21
310	50	-10	19	21

The 260 Call is bought and the 300 Call is sold. The maximum loss is Rs 19 which occurs when Satyam quotes at Rs 260 or below, the break even occurs at Satyam price of Rs 279 and maximum profit is derived when Satyam quotes at or above Rs 300.

Now the profit of Rs 21 is realized only on the day of expiry. If Satyam moves up to Rs 300 15 days before the day of expiry, the following Option prices may be expected to prevail in the market:

If Satyam was quoting at Rs 265 when you entered the position and Satyam moves up to Rs 300, the 260 Strike Option might move up by Rs 20 with passage of 10 days time. On the other hand, the 300 Strike Option which you sold might have risen by Rs 10 in the same circumstances. Thus, your gain on the two options is Rs 10 in the 10 day period. You have already incurred a cost of Rs 19 when you entered your position. The net profit is only Rs 9.

Compare this net profit of Rs 9 with the net profit of Rs 21 realized on expiry. You might find that Satyam has moved up smartly in the interim period (before expiry), but this increase does not provide you with a great profit. Now if Satyam were to fall back to levels around Rs 265 or so around the time of expiry, you might still make a loss.

To summarize this discussion, the payoff on the bull spread as seen at the point of expiry does not necessarily also get generated during the life of the Option itself. In such a case, you, as an investor, should square up the bull spread on a reasonable profit basis rather than waiting for expiry based profits. Though expiry profits are higher, they may never be realized if the scrip falls back to lower levels before expiry.

Thus, as a rule of thumb, you should be happy to net two thirds of the profit shown by the expiry payoff and square up at these levels.

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STEP-11

Derivatives Strategies

What are Strategies?

Strategies are specific game plans created by you based on your idea of how the market will move. Strategies are generally combinations of various products – futures, calls and puts and enable you to realize unlimited profits, limited profits, unlimited losses or limited losses depending on your profit appetite and risk appetite.

How are Strategies formulated?

The simplest starting point of a Strategy could be having a clear view about the market or a scrip. There could be strategies of an advanced nature that are independent of views, but it would be correct to say that most investors create strategies based on views.

What views could be handled through Strategies?

There could be four simple views : bullish view, bearish view, volatile view and neutral view. Bullish and bearish views are simple enough to comprehend. Volatile view is where you believe that the market or scrip could move rapidly, but you are not clear of the direction (whether up or down). You are however sure that the movement will be significant in one direction or the other. Neutral view is the reverse of the Volatile view where you believe that the market or scrip in question will not move much in any direction.

What strategies are possible if I have a bullish view?

The following strategies are possible:

- Buy a Future
- Buy a Call Option
- Sell a Put Option
- Create a Bull Spread using Calls
- Create a Bull Spread using Puts

Let us discuss each of these using some examples.

What if a Buy a Futures Contract?

If you buy a Futures Contract, you will need to invest a small margin (generally 15 to 30% of the Contract value). If the underlying index or scrip moves up, the associated Futures will also move up. You can then gain the entire upward movement at the investment of a small margin. For example, if you buy Nifty Futures at a price of 1,100 which moves up to 1,150 in say 10 days time, you gain 50 points. Now if you have invested only 20%, i.e. 220, your gain is over 22% in 10 days time, which works out an annualized return of over 700%.

The danger of the Futures value falling is very important. You should have a clear stop loss strategy and if your Nifty Futures in the above example were to fall from 1,100 to say 1,080, you should sell out and book your losses before they mount.

The graph of a Buy Futures Strategy appears below:

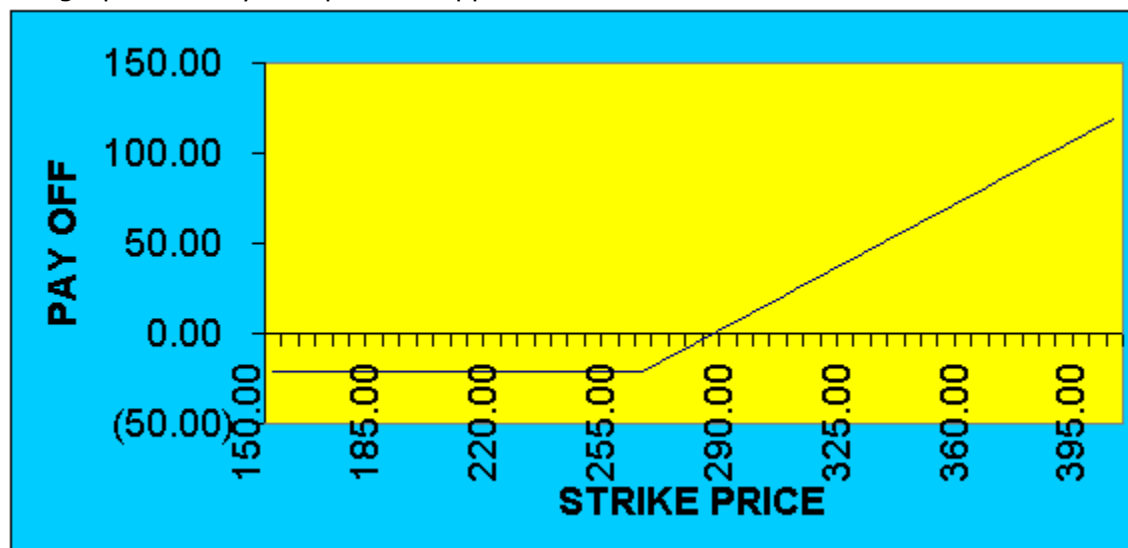


What if a Buy a Call Option?

If you buy a Call Option, your Option Premium is your cost which you will pay on the day of entering into the transaction. This is also the maximum loss that you can ever incur. If you buy a Satyam May 260 Call Option for Rs 21, the maximum loss is Rs 21. If Satyam closes above Rs 260 on the expiry day, you will be paid the difference between the closing price and the strike price of Rs 260. For example, if Satyam closes at Rs 300, you will get Rs 40. After setting off the cost of Rs 21, your net profit is Rs 19.

The Call buyer has a limited loss, unlimited profit profile. No margins are applicable on the buyer. The premium will be paid in cash upfront. If the Satyam scrip moves nowhere, the buyer is adversely impacted. As time passes, the value of the Option will fall. Thus if Satyam is currently at around Rs 260 and remains around that price till the end of May, the value of the Option which is currently Rs 21 would have fallen to nearly zero by that time. Thus time affects the Call buyer adversely.

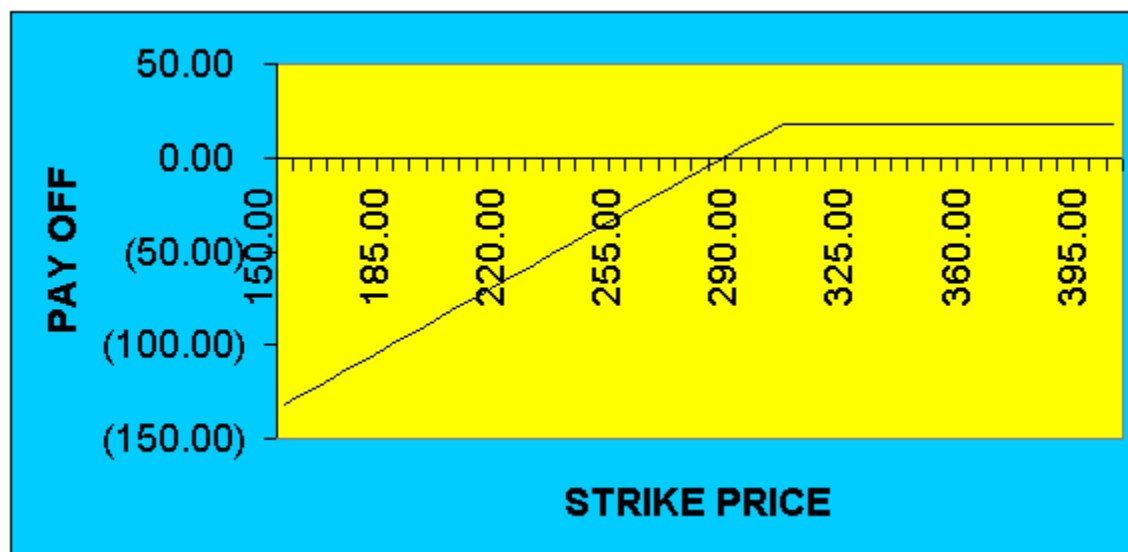
The graph of a Buy Call position appears below:



What if I sell a Put Option?

Another bullish strategy is to sell a Put Option. As a Put Seller, you will receive Premium. For example, if you sell a Reliance May 300 Put Option for Rs 18, you will earn an Income of Rs 18 on the day of the transaction. You will however face a risk that you might have to pay the difference between 300 and the closing price of Reliance scrip on the last Thursday of May. For example, if Reliance were to close on that day at Rs 275, you will be asked to pay Rs 25. After setting of the Premium received of Rs 18, the net loss will be Rs 7. If on the other hand, Reliance closes above Rs 300 (as per your bullish view), the entire income of Rs 18 would belong to you.

As a Put Seller, you are required to put up Margins. These margins are calculated by the exchange using a software program called Span. The margins are likely to be between 20 to 35% of the Contract Value. As a Put Seller, you have a limited profit, unlimited loss profile which is a high risk strategy. If time passes and Reliance remains wherever it is (say Rs 300), you will be very happy. Passage of time helps the Sellers as value of the Option declines over time.



The profile of the Put Seller would appear as under:

What are Bull Spreads?

First of all, Spreads are strategies which combine two or more Calls (or alternatively two or more Puts). Another series of Strategies goes by the name Combinations where Calls and Puts are combined.

Bull Spreads are those class of strategies that enable you benefit from a bullish phase on the index or scrip in question. Bull spreads allow you to create a limited profit limited loss model of payoff, which you might be very comfortable with.

How many types of Bull Spreads can be created?

Bull spreads can be created using Calls or using Puts. You need to buy one Call with a lower strike price and sell another Call with a higher strike price and a spread position is created. Interestingly, you can also buy a Put with a lower strike price and sell another with a higher strike price to achieve a similar payoff profile.

In the next article, we will see some examples of Bull Spreads along with other strategies.

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STEP-12 **Bearish Strategies**

Can we summarize the discussions held last time?

Last time we discussed option strategies which can be adopted if you are bullish. In particular, we elaborately discussed bull spreads. This time let us understand strategies you can follow if you are bearish.

What are the various bearish strategies possible?

The following major choices are available:

- Sell Scrip Futures
- Sell Index Futures
- Buy Put Option
- Sell Call Option
- Bear Spreads
- Combinations of Options and Futures

Let us discuss each one of them now.

What happens if I sell Scrip or Index Futures?

In the current Indian system, when you sell Scrip Futures, you are not required to deliver the underlying scrip. You will be required to deposit a certain margin with the exchange on sale of Scrip Futures. If the Scrip actually falls (as per your belief), you can buy back the Futures and make a profit. For example, Satyam Futures are quoting at Rs 250 and you sell them today as you are bearish. You could buy them back after 10 days at say Rs 230 (if they fall as per your expectations), generating a profit of Rs 20. Question of delivering Satyam does not arise in the present set up.

You will be required to place a margin with the exchange which could be around 25% (an illustrative percentage). If you accordingly place a margin of Rs 62.50, a return of Rs 20 in 10 days time works out to a wonderful 30% plus return.

Obviously, if Satyam Futures move up (instead of down) you face an unlimited risk of losses. You should therefore operate with a stop loss strategy and buy back Futures if they move in reverse gear.

You could adopt the same strategy with Index Futures if you are bearish on the market as a whole. Similar returns and risks are attached to this strategy.

How does a Put Option help in a bearish framework?

The Put Option will rise in value as the scrip (or index) drops. If you buy a Put Option and the scrip falls (as you believe), you can sell it at a later date. The advantage of a Put Option (as against Futures) is that your losses are limited to the Premium you pay on purchase of the Put Option.

For example, a Satyam 260 Put may quote at Rs 21 when Satyam is quoting at Rs 264. If Satyam falls to Rs 244 in 8 days, the Put will move up to say Rs 31. You can make a profit of Rs 10 in the process.

No margins are applicable on you when you buy the Put. You need to pay the Premium in cash at the time of purchase.

When should I sell a Call?

If you are moderately bearish (or neutral or bearish), you can consider selling a Call. You will receive a Premium when you sell a Call. If the underlying Scrip (or Index) falls as you expect, the Call value will also fall at which point you should buy it back.

For example, if Satyam is quoting at Rs 264 and the Satyam 260 Call is quoting at Rs 18, you might well find that in 8 days when Satyam falls to Rs 244, the Call might be quoting at Rs 7. When you buy it back at Rs 7, you will make a profit of Rs 11.

However, if Satyam moves up instead of down, the Call will move up in value. You might be required to buy it back at a loss. You are exposed to an unlimited loss, but your profits are limited to the Premium you collect on sale of the Call. You will receive the Premium on the date of sale of the Option. You will however be required to keep a margin with the exchange. This margin can change on a day to day basis depending on various factors, predominantly the price of the scrip itself.

You should be very careful while selling a Call as you are exposed to unlimited losses.

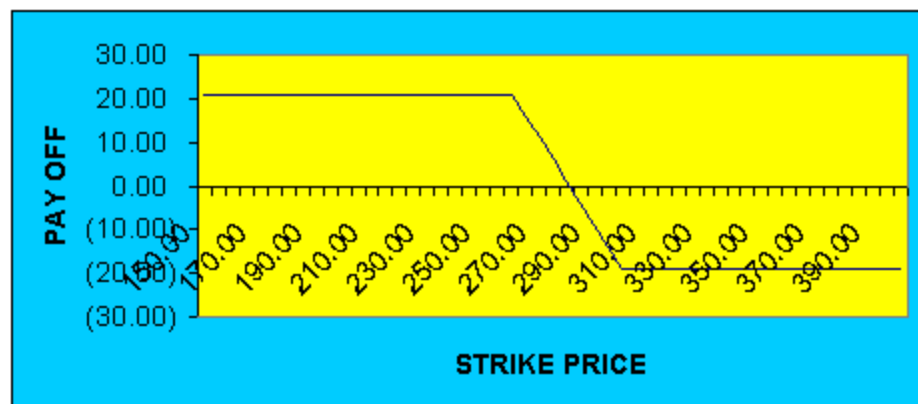
How do I use Bear Spreads?

In a bear spread, you buy a Call with a high strike price and sell a Call with a lower strike price. For example, you could buy a Satyam 300 Call at say Rs 5 and sell a Satyam 260 Call at Rs 26. You will receive a Premium of Rs 26 and pay a Premium of Rs 5, thus earning a Net Premium of Rs 21.

If Satyam falls to Rs 260 or lower, you will keep the entire Premium of Rs 21. On the other hand if Satyam rises to Rs 300 (or above) you will have to pay Rs 40. After set off of the Income of Rs 21, your maximum loss will be Rs 19.

Satyam Closing Price	Profit on 260 Strike Call (Gross)	Profit on 300 Strike Call (Gross)	Premium Received on Day One	Net Profit
250	0	0	21	21
255	0	0	21	21
260	0	0	21	21
270	-10	0	21	11
281	-21	0	21	0
290	-30	0	21	-9
300	-40	0	21	-19
310	-50	10	21	-19

The pay off profile appears as under:



In a bear spread, your profits and losses are both limited. Thus, you are safe from an unexpected rise in Satyam as compared to a clean Option sale.

How do I use combinations of Futures and Options?

If you sell Futures in a bearish framework, you run the risk of unlimited losses in case the scrip (or index) rises. You can protect this unlimited loss position by buying a Call. This combination will result effectively in a payoff similar to that of buying a Put.

You can decide the strike price of the Call depending on your comfort level. For example, Satyam is quoting at Rs 264 currently and you are bearish. You sell Satyam Futures at say Rs 265. If Satyam moves up, you will make losses. However, you do not want unlimited loss. You could buy a Satyam 300 Call by paying a small Premium of Rs 5. This will arrest your maximum loss to Rs 35.

If Satyam moves up beyond the Rs 300 level, you will receive compensation from the Call which will offset your loss on Futures. For example, if Satyam moves to Rs 312, you will make a loss of Rs 37 on Futures ($312 - 265$) but make a profit of Rs 12 on the Call ($312 - 300$). For this comfort, you shell out a small Premium of Rs 5 which is a cost.

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STEP-13 **Covered Calls**

In the last article, we discussed about strategies which you could use if you are bearish. Covered Calls is a strategy which could also incidentally fit into a bearish orientation.

What are Covered Calls?

Covered Calls are strategies where you have sold a Call. As a seller, you are exposed to unlimited losses. However, you hold the underlying security as a result of which, if the situation arises, you can always deliver the underlying and thus avoid such unlimited losses.

Can you give me an Example?

You are holding Satyam which is currently quoting at Rs 230. You are bearish on Satyam and you believe it might touch Rs 200 in the next 30 days. You therefore sell a Call with Strike Price 220 for Rs 15. You have earned this Income of Rs 25 as a Seller.

Now if Satyam were to move up (rather than down as per your expectation) you will face losses. For example, if Satyam moves to Rs 270, you will, as a seller, pay Rs 50 (difference between the Satyam price and the strike price).

However, you are not affected by this loss because, as a holder of Satyam itself, your holding has appreciated from the current level of Rs 230 to Rs 270 which has generated a profit of Rs 40.

Thus, the loss on the Call has been offset with the rise in the price of the underlying security. Your overall profit is Rs 15 computed as follows:

- Rs 25 as Income from Sale of the Call
- Rs 40 as appreciation in Satyam shares
- Less Rs 50 payout on the exercise of the Call.

When should I be interested in a Covered Call?

There are several situations which might make this product interesting. The classic one is where you hold a share which you like and would like to hold it in the medium to long term. You have no inclinations of selling it. However, you do believe that in the short term, there is no great potential for appreciation.

In fact you believe that the share will either stay where it is (neutral view) or it might even fall in price.

In this situation, you wonder how you can make money even when holding on to the share itself. For example, you hold Infosys which is currently quoting at Rs 3,400. You love Infosys and would like to keep it forever. However, in the short run, you believe Infosys will either fall or stay around the Rs 3,400 mark. Infosys 3,400 strike one month calls are currently quoting at Rs 150. If you sell these calls, you can generate an equivalent income. If your view is correct, you get to retain the entire Rs 150 with no costs.

What if my view is wrong?

If your view is wrong (and Infosys moves up), you still do not lose much because the loss on the Call will offset the gain on the appreciation of the share itself. You will still make your gain of Rs 150. The loss will be a loss of 'opportunity' in the sense that had you not sold the Call, you could have gained more in case of a substantial rise in the price of Infosys. The following table will give you a clear view.

Infosys Price	Income on Call	Appreciation on Shares	Net Profit	Opportunity Loss
3300	150	-100	50	0
3400	150	0	150	0
3500	150	100	150	0
3600	150	200	150	50
3700	150	300	150	150
3800	150	400	150	250

How are the above figures computed?

We are examining the situation from various possible levels of Infosys closing prices after a month. The appreciation is the income you would have earned had you not sold the Call. It could be depreciation also in the first case.

The actual income you earned was Rs 150 from the sale of the Call. The appreciation from the share would offset the loss on exercise of the Call and would set off against each other.

Opportunity loss would arise if the share appreciates substantially and your income is limited to Rs 150. This column is worked out as the difference between gain on appreciation less income from sale of call. Negative differences are not considered as there is no Opportunity loss in these cases.

How much can I earn?

As a simple example, suppose you earn Rs 150 per month for 12 months of the year on Infosys, that would work out to Rs 1,800 per annum i.e. 55% of the share price itself. These can become much more powerful than a dividend stream and can considerably enhance your earnings.

Where else can this strategy be used?

You can use this Strategy to protect your position in two cases. One – you have sold a Call but you now believe that selling the Call was a slightly risky proposition and leaves you with unlimited potential losses. You need a hedge on that open Call sold position.

You can buy the underlying security itself and set off possible potential losses on the Call with the appreciation on the underlying.

In the current Indian situation, you can buy Futures on the underlying (rather than the underlying itself) and create a similar hedge on your Call.

Can we take an example?

You have sold Reliance 280 Calls (at Rs 12) when prices got depressed on account of war related rumors. You were at that time bearish on Reliance and quite justified in selling these calls.

Now that the war rumors have died down, Reliance appears to be moving up (or you believe that Reliance might move up). Your call position is still outstanding and you could face losses if Reliance in fact moves up.

You want to protect your position. If you buy Reliance at say Rs 282 now, your position is now hedged. Any upward movement now will generate profits on your Reliance holdings which will upset any losses on the Calls.

Alternatively, you could buy Reliance Futures instead. This would reduce your requirement of funds and could be more interesting than buying the underlying shares themselves.

What are the risks of this protection?

While you have successfully covered the upward risk of Reliance shares, you have now assumed downward risk. If Reliance moves down to say Rs 250, your Reliance portfolio will generate a loss of Rs 32 while the Income from the Call was only Rs 12.

Where else can the Covered Call be useful?

suppose you are bullish on a Scrip and are hence buying the Scrip now (or the Futures on the Scrip), you can use Covered Calls to reduce your effective cost.

Can we take an Example?

Suppose Hindustan Lever is quoting at Rs 185 and you are bullish on the Scrip and hence want to buy the Scrip (or its Futures). You however do not believe that the Scrip will move up beyond Rs 200 in the next 30 days.

You could buy the Scrip (or its Futures) for Rs 185 and at the same time sell a Call on the Scrip with Strike Price Rs 200. You could earn an Income of say Rs 8 on the Call.

This would reduce your effective cost of acquisition to Rs 177 (Rs 185 less Rs 8).

What is the risk in this case?

The risk is that of Opportunity Loss. You are (by accepting a premium of Rs 8) giving up all appreciation benefits beyond Rs 200. Thus, if the Scrip touches Rs 206, you will be entitled to appreciation only up to Rs 200. The gains beyond this level will be offset against losses on the Call.

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STEP-14

NEUTRAL AND VOLATILE STRATEGIES

Can we summarize the earlier discussions on Option Trading Strategies?

In our previous discussions, we covered Bullish and Bearish Strategies. We also discussed Covered Calls in detail. We now turn to Option Strategies which you can apply if you are Neutral or if you believe the market will turn Volatile.

What does Neutral mean?

Neutral means you believe that the index or scrip in question is likely to remain wherever it is, or that the movement is not likely to be significant. For example, if the Sensex is around 3,200 now and you believe that the Sensex will stay around this level in the next two weeks, you are said to be Neutral.

What does Volatile mean?

A volatile view will imply that you believe the market will definitely move either upwards or downwards, but you are not sure which way the movement will occur. You are however quite sure that the market will not stay where it is. In this sense, a Volatile view is quite the opposite of the Neutral view.

What strategies can be applied to these situations?

The most common strategies to both situations are Straddles and Strangles.

What is a Straddle?

A Straddle is a strategy where you buy a Call Option as well as a Put Option on the same underlying scrip (or index) for the same expiry date for the same strike price. For example, if you buy a Satyam July Call Strike Price 240 and also buy a Satyam July Put Strike Price 240, you have bought a Straddle.

As a buyer of both Call and Put, you will pay a Premium on both the transactions. If the Call costs Rs 12 and the Put Rs 9, your total cost will be Rs 21.

When will I buy a Straddle?

You will buy a Straddle if you believe that Satyam will become volatile. Its current price is say Rs 240, but you think it will either rise or fall significantly. For example, you could believe that Satyam could rise right up to Rs 300 or fall up to Rs 200 in the next fortnight or so.

Why should it fluctuate so much?

There could be various situations which might warrant heavy movement. For example, during Budget time, a favorable proposal might impact the price favorably and if nothing favorable is proposed, the price could fall significantly. An Indian company could be considering collaborations with a major foreign company. If the collaboration were to happen, the price could rise, and if it were not to happen, the price could fall.

An Indian company might be expecting a huge order from a foreign company. The market might be awaiting news on this front. While a positive development might result in a price rise, a negative development might dampen the prices.

Some companies might face huge lawsuits. The decision could significantly impact prices any which direction.

In all these cases, you are sure that the price will either move up or move down, but you are not clear which way.

How will the Straddle help me?

Let us continue the above example. You have bought the Call and the Put and spent Rs 21. The current price and the strike price are the same Rs 240. Your profile will be determined as under:

Satyam Closing Price	Profit on Call	Profit on Put	Initial Cost	Net Profit
200	0	40	21	19
210	0	30	21	9
220	0	20	21	-1
230	0	10	21	-11
240	0	0	21	-21
250	10	0	21	-11
260	20	0	21	-1
270	30	0	21	9
280	40	0	21	19

Thus you make maximum profit if the price falls significantly to Rs 200 or rises significantly to Rs 280. You will make a maximum loss of Rs 21 (your initial cost) if the price remains wherever it currently is.

What are the other implications of Straddle?

As a buyer of the Straddle, you will pay initially for both the Call and the Put. You need not place any margins as you are a buyer of both Options. If time passes and the scrip remains at or around the same price (in this case Rs 240), you will find that the Option Premia of both the Call and the Put will decline (Time Value of Options decline with passage of time). Hence, you will suffer losses.

When will I sell a Straddle?

You bought a Straddle because you thought the scrip will become volatile. Conversely, the seller of the Straddle would believe that the scrip will act neutral. The seller will believe that the price of Satyam will stay around Rs 240 in the next fortnight or so. Accordingly, he will sell both the Call and the Put.

If the price indeed remains around Rs 240, he will make a maximum gain of Rs 21. If the price were to move up or down, he will make a lower gain as he will have to pay either on the Call (if it moves up) or on the Put (if it moves down).

What is the break even point of the Straddle?

The Straddle has two break even points viz. the Strike Price plus both Premia and the Strike Price minus both Premia. In the above example, the two break even points are Rs 261 ($240 + 21$) and Rs 219 ($240 - 21$). As seen earlier, the break even points are the same for the buyer and the seller.

What are the other implications for the seller?

As a seller, he will receive the Premia of Rs 21 on day one. He will have to place margins on both the Options and hence these requirements could be fairly high. If time passes and the scrip stays around Rs 240, the seller will be happy as the Option values will decline and he can buy back these Options at a lower level. On the other hand, if the scrip moves, he should be careful and think of closing out early.

What is a Strangle?

A Strangle is a slightly safer Strategy in the sense that you buy a Call and a Put but at different strike prices rather than one single strike price as in the case of a Straddle. For example, you could buy a Satyam Put Strike 220 and a Satyam Call Strike 260 at prices of Rs 5 and Rs 6 respectively. This would cost you Rs 11 and you would have a Volatile view on the scrip.

The lower cost would however imply a wider break even and you would make profit only if the Scrip moves up or down by a wider margin.

The profit potential is provided in this table:

Satyam Closing Price	Profit on Call	Profit on Put	Initial Cost	Net Profit
200	0	20	11	9
210	0	10	11	-1
220	0	0	11	-11
230	0	0	11	-11
240	0	0	11	-11
250	0	0	11	-11
260	0	0	11	-11
270	10	0	11	-1
280	20	0	11	9

The two break even points here would be worked out as lower strike minus the two premia and higher strike plus the two premia respectively. In this case, the break even points are Rs 209 ($220 - 11$) and Rs 271 ($260 + 11$).

We will discuss the finer points of these strategies in the next Article.

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STEP-15

STRADDLES, STRANGLES AND BUTTERFLIES ...

Can you summarize the discussion last time?

Last time we discussed about strategies which you could follow if you believe that the market will stay neutral or will become volatile. In that context, we discussed straddles and strangles.

More suggestions on straddles and strangles?

As a seller of these strategies, you are open to unlimited risk. Most option writers would prefer to sell strangles rather than straddles. As you are aware, a straddle sale comprises of a call and a put sold at the same strike price. For example, if you sell a Satyam 240 Strike Straddle with Call and Put premia at Rs 11 and Rs 13 respectively, you will receive Rs 24 as Income and the two break even points will be Rs 216 and Rs 264 respectively.

If Satyam moves below Rs 216 or Rs 264, your losses are unlimited.

In a Strangle, the loss range becomes wider as the Call and Put are at different strike prices. For example, you could sell a Satyam 220 Strike Put at Rs 5 and a Satyam 260 Strike Call at Rs 6. While you could earn lower premium of Rs 11 (as against Rs 24), your break even points are much wider at Rs 209 and Rs 271 respectively.

So what is the conclusion?

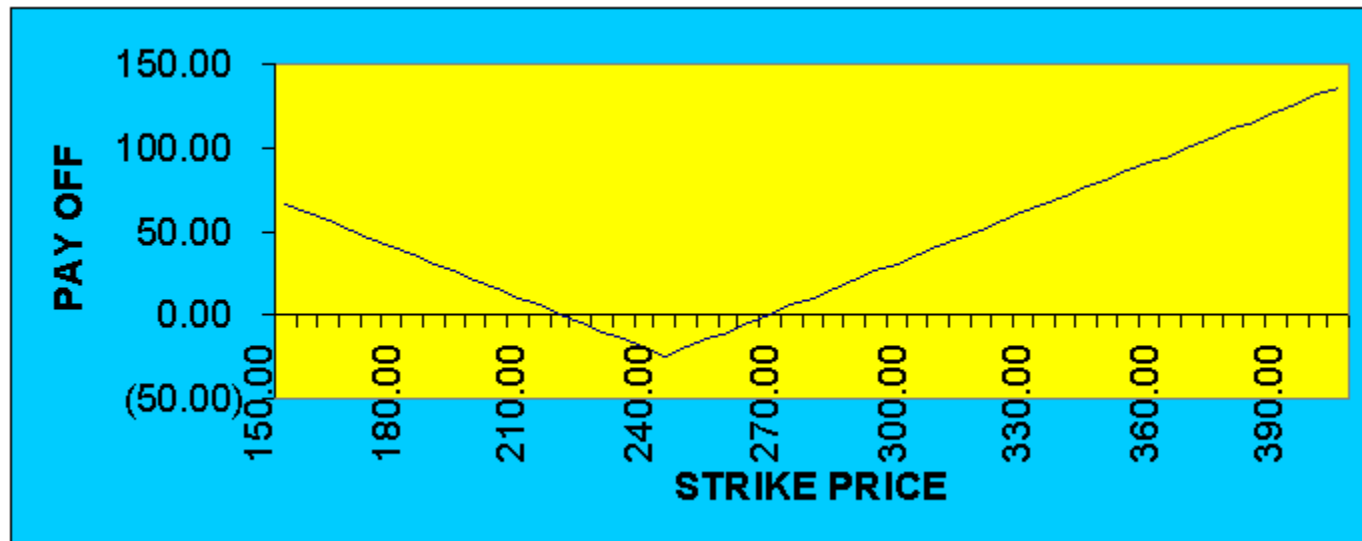
As a seller of options with a neutral view, you should sell strangles rather than straddles – this is a relatively lower risk lower return strategy.

What would I do as a buyer?

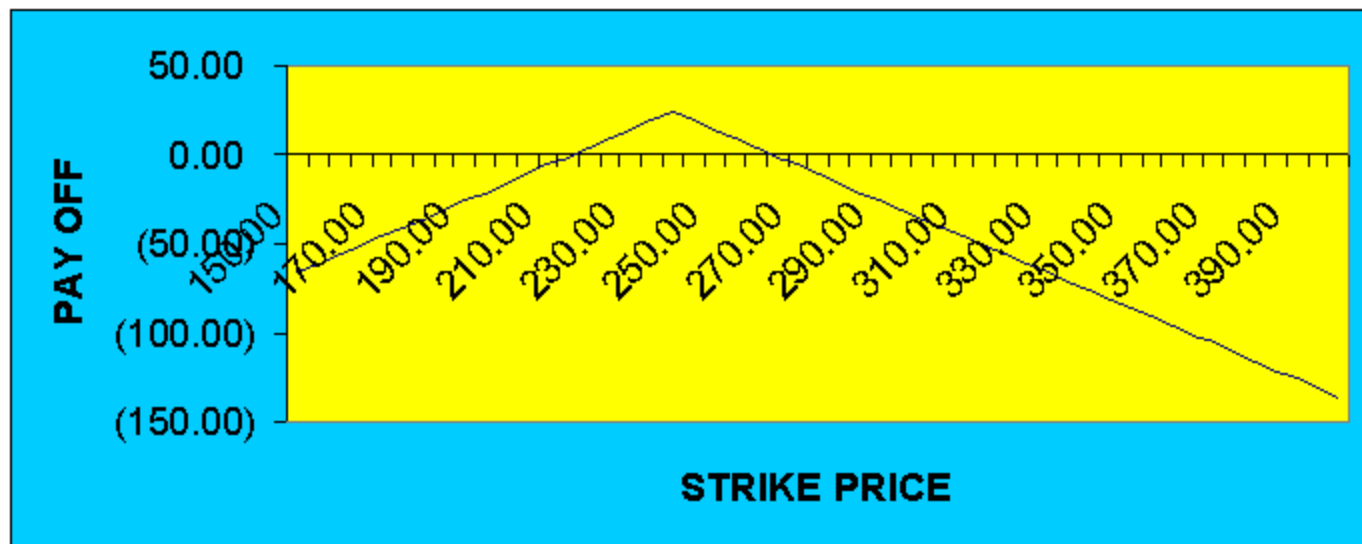
As a buyer of volatility, you would rather buy straddles most of the time (rather than strangles) as you would expect to profit faster in a straddle than the strangle. You would consider the premia that it costs you to buy a straddle, but if that is reasonable then you would actively pursue this strategy.

The pay off diagrams of the straddle and strangle for the buyer and seller are presented here for your easy understanding:

Straddle Buyer



Straddle Seller



What is a butterfly?

If you are a seller, you are exposed to unlimited losses in both straddles and strangles. This profile may make you uncomfortable and you might like to reduce or limit your loss possibilities.

The butterfly strategy helps you to achieve this result. You would in this case, cut the wings of your straddle. To cut the wings, you would buy a Call with a higher strike price and buy another put with a lower strike price than that of the Straddle.

Example:

You have sold a Straddle on Satyam with Strike Price 240 and generated an Income of Rs 24 (as above). You could buy a 260 Strike Call for Rs 5 and buy a 220 Strike Put for Rs 6. This would cost you Rs 11, thus reducing your Net Income to Rs 13. It will however insure you from losses at both ends.

The final payoff table will emerge as under:

Satyam Closing Price	Profit on 240 Sold Call	Profit on 260 Bought Call	Profit on 220 Bought Put	Profit on 240 Sold Put	Net Profit Including Initial Income of Rs 13
200	0	0	20	-40	-7
210	0	0	10	-30	-7
220	0	0	0	-20	-7
230	0	0	0	-10	3
240	0	0	0	0	13
250	-10	0	0	0	3
260	-20	0	0	0	-7
270	-30	10	0	0	-7
280	-40	20	0	0	-7

Thus, you will generate a maximum profit of Rs 13 if Satyam remains at your Straddle Strike price of Rs 240. Your maximum loss is restricted to Rs 7 which happens when Satyam moves either below Rs 220 or above Rs 260. This loss is capped on both sides.

The payoff diagram for Butterfly appears as under:

Why should I use Butterfly as a Straddle Buyer?

As a Straddle Buyer, you are paying a fat premium (e.g. in the above example Rs 24). This premium is paid for the gains that you might make for unlimited possible movement in the stock. Now you might expect that the stock might not move unlimited both ways. For example, you might believe that Satyam might rise but not above Rs 260 and might fall but not below Rs 220.

Why should you therefore pay for movement which in your opinion might never happen? You should in that case, sell a 260 Call and generate Rs 5 as premium income. Similarly you should sell a 220 Put and generate Rs 6 as premium income. This will have two impacts:

One – you gain Rs 11 as income, thus reducing your cost to Rs 13 (from Rs 24)

Two – you are giving up gains above Rs 260 and below Rs 220

Any limitations of Butterfly?

The main problems with these strategies which require you to enter into a number of transactions are as under:

- Several transactions result into high brokerage costs (to enter into a butterfly and then square up makes it 8 transactions);
- Liquidity might not be available at all strike prices;
- All four transactions might take time to execute at your desired prices – if prices change in the meantime, you might find the butterfly payoffs do not occur as you desired

Conclusions:

Straddle, Strangle and Butterfly are very useful and practical strategies for neutral and volatile views on the market (index) or on individual stocks. You need to have a clear view and need to pick underlying with good volumes and liquidity in order to execute these strategies well. You also need to keep one eye on volatility all the time

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STEP-16 **OPTION GREEKS**

What are Option Greeks?

Option Greeks are mathematical outputs from an Option Valuation Model which help you to understand the possible future movement in Option Values based on various underlying parameters. Greeks help you in possible predictions of Option Values and help you to fine tune your buy sell hedge decisions much better. While Greek formulae look heavily mathematical and formidable, they are not as difficult as they appear.

Which are the common Greeks used?

The common Greeks are Delta, Gamma, Vega and Theta.

What does Delta indicate?

Delta stands for the change in the Option Value for a given change in the price of Shares. For example, if the Delta of a Call Option is 0.65, the meaning is: If the share price moves up by Re 1.00, the Call Option will rise up by Rs 0.65. Call Option Deltas are by definition positive indicating that a rise in share price will also result in a rise in the Option Value. Put Option Deltas are by definition negative, indicating that a rise in share price will result in a fall in the Put Option Value.

What does Gamma stand for?

Gamma stands for the change in Delta itself for a given change in the share price. Technically, it is called a second order derivative. Let us take an example. For a given share price, the Delta of an Option is currently 0.65. The Gamma at the moment is 0.02. This means: If the share price moves up by Re 1.00, the Option Value will move up by Rs 0.65 (meaning of Delta as discussed above). When this happens, the Delta itself will become 0.67 (i.e. 0.65 as earlier plus 0.02). Thus, the Gamma predicts movements in Delta given changes in the underlying share price.

What does Vega indicate?

Vega indicates impact of Volatility. As we have discussed earlier, Volatility has a positive impact Option Values. Both Calls and Puts will increase in Value if Volatility rises and fall in Value if Volatility falls. Vega determines the increase or decrease in Value with precision. For example: if Vega is 0.09, the meaning is that the Option Value will rise by Rs 0.09 for an increase of 1% in Volatility. If the current Volatility of Satyam is 35% and the Value of an Option is Rs 11, the implication is that were the Volatility to move up to 36%, the Option Value would rise to Rs 11.09. Conversely, if Volatility were to fall, the Option Value will correspondingly decrease.

What does Theta stand for?

We have discussed earlier that Option Values will decrease with passage of time. The Time Value component of the Option will gradually move down to zero on expiry day. Theta determines precisely how much the value of the Option will decrease by passage of time. For example, if the Theta of an Option is -0.17, this means the value of this Option will decrease by Rs 0.17 on passage of one day.

Are there other Greeks?

There are other Greeks like Rho and third order derivatives which are not very practical for the Indian scenario right now. The relevance of such Greeks would be applicable in a highly sophisticated market and for institutional players. For retail investors, the four Greeks discussed above should suffice.

How do I apply these Greeks in my investing practice? Shall we deal with application of Delta first?

Delta is the most important Greek and the most commonly applied one. Delta tells you how much the Option will move. In most cases, you have a view and you have chosen to trade in Options based on that view. You will however make a profit only if the Delta is sensitive enough.

Let us take an example. Satyam is currently quoting at Rs 235. You have a choice of various Call Options as under. You are bullish on Satyam.

Strike Prices	Option Value	Delta
200	48	0.80
220	28	0.55
240	8	0.45
260	4	0.25
280	2	0.05

A common question which arises in most minds is which Option should I buy?

Which one would most retail investors buy?

Many investors buy the far out of the money call (Strike Price 280) on the ground that it is cheap (only Rs 2).

Is that the correct decision?

It depends on how bullish you are. Do you expect Satyam to move up from the current level of Rs 235 to as high as Rs 280 or higher in the next fortnight or so (assuming that a fortnight is left for expiry)? If yes, then do go ahead and buy the Rs 280 strike Call. But if not, then you are making a mistake.

What mistake?

Well, you buy the Call for Rs 2. You pay a brokerage on the Notional Contract Value which itself comes to Rs 0.25 (let us say). Now Satyam does move up. But it moves up from Rs 235 to say Rs 248 in the next 10 days. Where do you think your Option will be quoting at?

Where?

Well, it would most probably be quoting at below Rs 2.

Why? Option Prices are supposed to move up when the Share price moves up?

Yes, you are perfectly right. But look at the Delta. The Delta is only 0.05. This implies that for Satyam moving up by Rs 13 (Rs 235 to Rs 248), the Option Value will move up by Rs 13 * 0.05 i.e. Rs 0.65. In the meantime, there is the impact of Time on the Option. 10 days have

passed out of a total of 15 days. Hence, the Time value would have reduced. Thus, it is most probable that the Option is quoting below Rs 2 at that time.

Now do you realize what the Delta is telling you? It is telling you that though you are bullish, though you might be right in your view, this particular Option is not sensitive to mild or moderate bullishness at all. You will lose money here.

Which Option should I buy then?

If you are mildly bullish or moderately bullish, you should go in for the in-the-money options or at-the-money options. These will rise faster and smartly with the underlying price rising. Further, you might find that the deltas improve with passage of time.

Technically, you can understand that you are almost buying the share itself (but a fraction of the price) if you buy high delta Options. For example, if you buy the Satyam 200 Strike Call (with a Delta of 0.80), you are almost buying Satyam itself but at a price of Rs 48 rather than Rs 235. If Satyam moves up to say Rs 250 in the next 10 days, the Option value will move up by 80% of that appreciation (i.e. Rs 12). Of course, the value will get diluted due to passage of time too. But the basic appreciation is much higher than the Rs 280 call.

It is believed that most professional players buy in the money and at the money options while amateurs buy out of the money options. As a result, amateurs might be losing most of the time.

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STEP-17 **DELTA NEUTRAL STRATEGIES**

Can you briefly summarize what is Delta?

We have discussed Delta in our previous articles. Delta indicates the responsiveness of the option price to the price of the underlying. It varies between 0 (no responsiveness) to 1 (100% responsiveness). For example, if Satyam is quoted at Rs 240 and the 240 Strike Call Option carries a Delta of 0.52, it means that if Satyam were to move up by Re 1, to Rs 241, the Option price will move up by Rs 0.52. If it were Rs 17 now, it would become Rs 17.52.

We have also discussed that In The Money Options have higher Deltas and are hence more responsive to underlying price changes, while Out of the Money Options have lower Deltas and do not respond actively. If you buy Out of the Money Options, it may well happen that your prediction about the directional movement of the underlying was right, but you still did not make significant gains due to low Deltas.

What is Delta Neutral?

Skilled players in the derivatives market might not be interested in predicting directional movements on the underlying. They might be interested in reviewing volatility closely and profiting on volatility predictions. Remember volatility does not depend on direction, it merely depends on the fluctuation level (up or down).

Thus, delta neutral players compare the historical volatility of the scrip with the implied volatility of the option price at the moment. If they believe that a particular call option is under priced (for example, historical volatility is 41% while the option is priced at 51%), they will sell the option to gain advantage of the higher price.

But the moment they sell the option, they are caught in the framework of price prediction of the underlying in the sense that if the underlying moves up, the call option price will also move up. They however are not concerned in understanding or predicting the underlying price movement.

They will therefore take up an opposite position in the underlying. The objective is to neutralize the movement in the price of the underlying with the movement in the price of the option itself, so that they gain based on volatility alone and not on price movement.

How will they decide the volume of the underlying to trade?

This is based on delta of the option at that point in time. For example, if a Satyam 240 call option with 20 days to expire and Satyam itself quoting at Rs 240 is priced at Rs 12, the implied volatility is 51% (you can derive this from a Black Scholes calculator). The historical volatility is say 41%. Thus, the option is expensive and hence you sell the option.

You will look up the Delta of the option, which happens to be 0.54. One contract of Satyam is 1,200 Units. You have a positive Delta which means that with Satyam going up the price of the Call will move up (Rs 0.54 for every upward movement of Re 1.00 in Satyam) and will move down correspondingly.

You do not want to bet on this directional movement. You will therefore buy Satyam futures to the tune of $1,200 \times 0.54$ i.e. 648 Futures. This will neutralize the impact in such a manner that whether Satyam moves up or down, the changes in Futures price will offset the changes in the Option price.

For example, if Satyam moves up to Rs 245 tomorrow, you will find that the Option price has moved up to Rs 14.54. In case you wonder why, the background is with a Delta of 0.54, the Option price should go up by Rs 2.70 ($0.54 \times \text{Rs } 5$ upward movement in Satyam). As one day has passed, the time factor will impact Option prices downward – say by Rs 0.16. Thus, the net Option price will tend to go up by Rs 14.54 (derived from the Black Scholes calculator).

You will have lost Rs 3,048 on the Call. You will find that you have gained Rs 3,240 on the Futures, thus generating a net gain of Rs 152.

What is the next step?

The next step is to look for and define re-hedging techniques.

What is re-hedging?

The act of buying futures in the above example is hedging your option sale position with the help of Delta. This Delta is however not static. When the Delta changes, your hedge position of 648 Futures might no longer be valid.

For example, on the next day, the Delta has changed to 0.61 (as per Black Scholes Calculator). Thus, you need a hedge position of $1,200 \times 0.61 = 732$ Futures. You already have bought 648 Futures. You should now buy the balance 84 Futures.

This new position will now help you to balance your gains and losses.

Thus on the third day, if Satyam moves down to say Rs 241, your position will be as under:

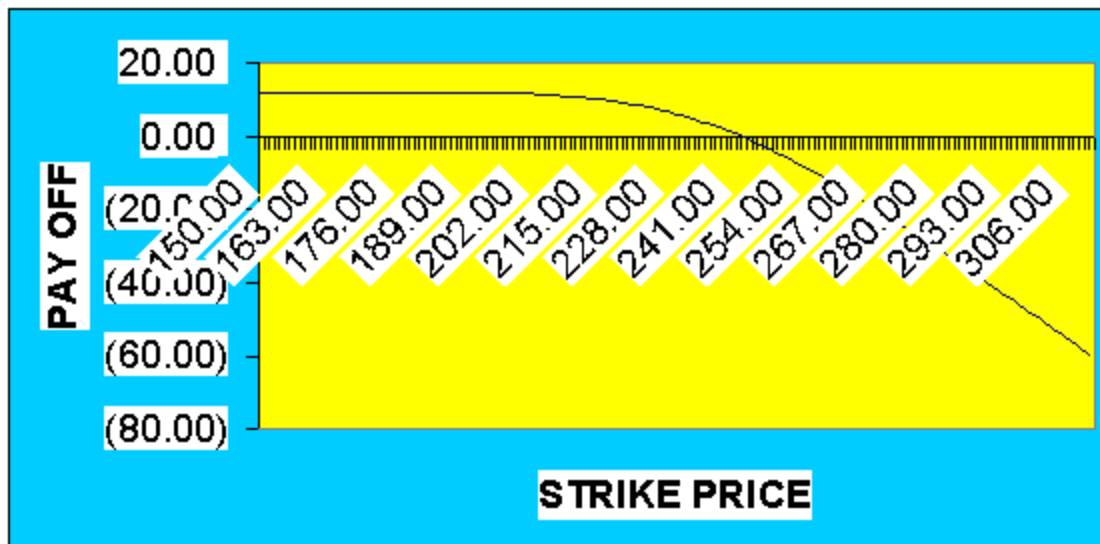
The Option price will be Rs 11.90. As you sold at Rs 12, your net gain is Rs 120 (i.e. Rs 0.10 on 1,200 Units). On Futures, you bought 648 Futures at Rs 240 and another 84 Futures at Rs 245. The current price is Rs 241. Thus you make a profit of Re 1.00 on 648 Futures and a loss of Rs 4 each on 84 Futures. The net profit will be 312 on Futures. The total profit will be Rs 422.

How long will this go on?

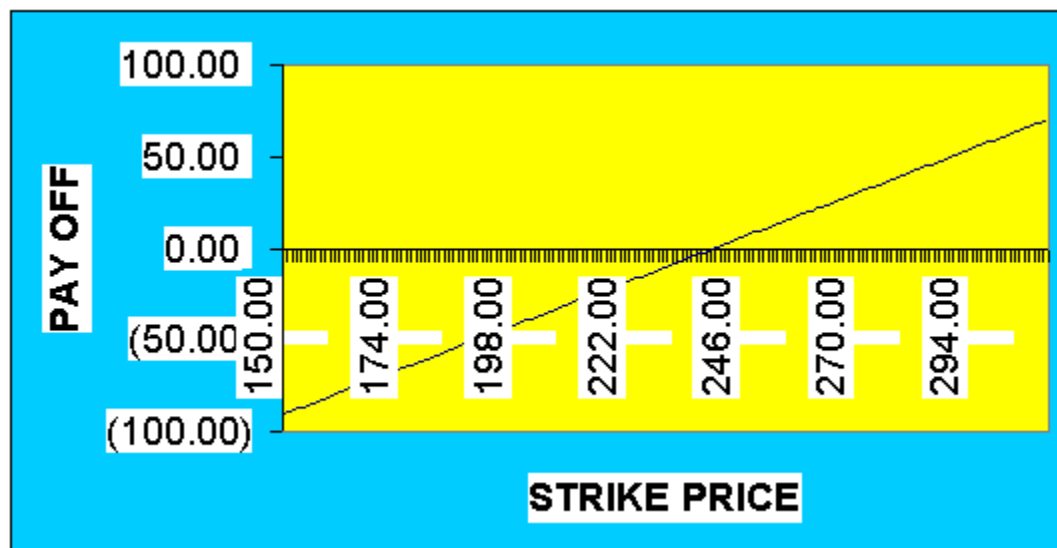
This process of re-hedging can go on up to the expiry day, unless you believe you have generated a decent profit and want to now exit.

You will generate a net profit on this strategy if the volatility of the Option on an implied basis reduces in the period before expiry and moves towards the historical volatility level of 41%. That is your expectation too.

The payoff profiles of the two positions are provided in these graphs. The payoff of the Call is first provided.



The payoff of the futures position appears like this:



The directional movements as you can observe are opposite and in effect attempt to cancel out each other.

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STEP-18 ACCOUNTING FOR DERIVATIVES

Who decides accounting regulations for derivatives?

Accounting is regulated in India by the Institute of Chartered Accountants of India (ICAI) which issues Accounting Standards and Guidance Notes from time to time on various areas. The ICAI has issued Guidance Notes for the Accounting of Index Futures and Options. The Options accounting Guidance Note covers both Index Options and Stock Options. No Guidance is available for the accounting of Stock Futures at the moment.

Readers should appreciate that accounting guidelines do not relate to tax issues which are decided by the Ministry of Finance along with the Central Board of Direct Taxes. This article covers only Accounting of Derivatives. Tax issues will be discussed in a later Article.

How do we account for initiation of an Index Futures contract?

When you buy (or sell) an Index Futures contract, you pay an Initial Margin amount to your broker. This amount paid is treated as a Current Asset and shown in your Balance Sheet.

The notional value of the contract will be far higher than the amount of margin paid. The Notional Value of the contract is not accounted in the books because you are not paying this value, nor are you liable to pay this value in the future.

What happens to daily settlement mark to market margins?

At the close of each trading day, the broker is required to debit you for mark to market losses and credit you for mark to market profits. The ICAI has taken a stand that these profits and losses are not in the nature of accounting accruals. Hence, they will not be taken to the profit and loss account on a daily basis. These amounts, whether paid or received, will be reflected under Current Assets in the Balance Sheet along with the Initial Margin amount earlier reflected.

What happens when I square up my contract?

When you square up your contract, the entire profit or loss on the contract (which is the sum of all the daily mark to market profits and losses from the date of initiation to the date of squaring up) will be taken to the profit and loss account representing realized profits on square up.

The brokers account will be appropriately debited or credited for the second impact of the transaction. The broker will pay (or receive) the margin which will be appropriately accounted.

Thus, realized profits/losses are taken to Profit & Loss Account while unrealized profits/losses are retained in the Balance Sheet as far as day to day accounting is concerned.

What if Margins are paid in non cash forms?

Initial Margins can be paid in the form of cash, cash equivalents (treasury bills, Government securities, debt securities, bank guarantees, and fixed deposits) or equities. In the case of payment by cash, the above accounting practice will be followed. If margins are paid in non cash forms, no accounting entry will be required. In the Notes to the Accounts, the fact that such margins have been paid will be disclosed.

How is accounting for the year end effected?

As discussed above, unrealized profits are not recognized for the purposes of daily accounting. However, at the year end the enterprise is required to work out the unrealized profits or losses on all the index futures contract open on the last day. If the net impact of all such index futures contracts is a profit, no further accounting is required as unrealized profits are not accounting as per regular conservative principles.

However, if the net impact of all such contracts is a loss, the enterprise is required to provide for such losses. Thus, the enterprise will on the hand debit the Profit & Loss Account and on the other hand create a liability towards this unrealized loss.

How are Options accounted at Initiation?

If you are a buyer of a Call (or a Put), you will pay a premium on the day of initiation of the contract (or soon thereafter). This premium amount is reflected as a Current Assets in your Balance Sheet.

If you are a seller of the Call (or the Put), you will receive this premium on the day of initiation or soon thereafter. This amount of premium received is reflected as a Current Liability in your Balance Sheet.

How are Margins accounted?

In the Options market, buyers are not required to pay any margins and hence the question of accounting will not arise. Sellers are required to pay margins which will be accounted as Current Assets in their Balance Sheets if paid in cash. If paid as cash equivalents or equity, there is no accounting entry required, but a disclosure in the Notes will be necessitated.

Such margins will be similarly accounted whether paid on the day of initiation or paid sometime later during the life of the Option Contract.

What happens when the Option is squared up?

Options can be squared up in the following ways:

- Sale of a purchased Option
- Purchase of a sold Option
- Exercise by the Buyer (resulting in square up for the exercising Buyer and a seller chosen by a computer algorithm)
- Expiry

On square up by way of purchase or sale, you will realize a profit or a loss. For example if you had bought an Option for Rs 23 and you have now sold it for Rs 34, you have made a profit of Rs 11. This profit will be taken to the Profit & Loss Account.

In the case of exercise, the buyer will receive intrinsic value (difference between the strike price of the option and the closing price of the underlying) and the seller will pay this intrinsic value. This intrinsic value will be treated as the transaction price and accordingly, profit or loss will be determined. The accounting implications will remain the same as above.

In the case of expiry, the option may or may not close in the money. If it closes in the money, the buyer will receive intrinsic value and the seller will pay the same amount. The accounting will remain the same as above. If the option closes at or out of the money, the buyer will receive nothing. The entire option price paid by him (and reflected as a Current Asset in the Balance Sheet) will not be written off to the Profit & Loss Account as an expense. The seller will not pay any amount to the buyer on expiry in this situation. The entire Option Premium collected by the Seller (and taken to Current Liabilities in the Balance Sheet) will now be transferred to Income into the Profit & Loss Account.

What happens at the year end?

At the year end, you should value the Options which are open as on the last day. This valuation should be compared with your cost (if you are a buyer) and your collections (if you are a seller). Unrealized profits or losses should accordingly be computed.

If you have unrealized profits, no further accounting is required. If you have unrealized losses, you need to provide for these losses in your Profit & Loss Account.

The ICAI has taken a stand that if you have a number of transactions in various underlying securities, you cannot set off losses on one underlying vis-à-vis profits on another for the purpose of determination of the provision towards unrealized losses. For example, you have an unrealized profit of Rs 8,000 on Satyam Options and an unrealized loss of Rs 3,200 on Infosys Options, you need to provide for the entire Rs 3,200 of unrealized loss. You cannot argue that the net amount is a profit if you consider Satyam and Infosys on a combined basis.

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STEP-19 STRADDLES

Let us discuss the concept of Straddles in detail in this Article.

What is a Straddle?

A Straddle is a strategic option combination which is adopted when you are not sure about whether the underlying will go up or down, but are certain that one of the two movements will happen. Readers should appreciate that accounting guidelines do not relate to tax issues which are decided by the Ministry of Finance along with the Central Board of Direct Taxes. This article covers only Accounting of Derivatives. Tax issues will be discussed in a later Article.

For example, last week, there was a proposal for disinvestments proposal for HPCL and BPCL. The Government was expected to take some stand on the issue. What the stand will be was not unknown. But some pronouncement was expected. If the pronouncement were positive, the shares would have gone up substantially and if the pronouncement were negative, the shares would have gone down substantially.

This is an excellent opportunity to buy a straddle.

What do I buy in a Straddle?

You buy one call and one put together in a Straddle, generally at the money. For example, if HPCL was quoting at Rs 220, you would buy one 220 Call and one 220 Put at this time.

If HPCL moves up, the call will rise in value and the put will fall. The net amount will be positive if the HPCL movement is substantial. On the other hand, if HPCL moves down, the put will rise in value and the call will fall. Again, the net amount will be favourable if the HPCL downward movement is significant.

What could be good times for a straddle?

Major pronouncements like divestment, budget time, acquisitions announcements by companies, lawsuits to be decided on a particular day (this may be relevant for the pharmaceutical industry where major foreign lawsuits could decide whether generic and other pharma products could be sold by Indian companies in the US under patent regulations or not) are good times to buy straddles.

What can go wrong?

If the underlying fails to move either way and stays where it is, you would lose your time value of both options as both options would fall with passage of time. If your strategy is announcement related and the announcement is a rather mixed one with some positives and some negatives, the market may not move at all.

Your maximum loss is restricted to the total amount you paid for the call and the put taken together. In practice, this maximum loss will almost never happen. For example if you bought the HPCL 220 Call and the 220 Put for Rs 30, you will lose the entire Rs 30 only if HPCL closes on the last Thursday (expiry day) at exactly Rs 220. If it closes above Rs 220, you will get some payoff from the Call and if it closes below Rs 220, you will get some payoff from the Put.

How long should I wait?

If your strategy was pronouncement related, you should wait at least one or two days after the pronouncement. If it moves up or down substantially, you could square up your position, pocket profits and exit.

If it does not move, you should consider waiting depending on whether some further pronouncements are expected (sometimes clarifications follow after some time).

If your strategy was not pronouncement related, then you should develop clear rules for entry and exit. This depends upon your market knowledge and derivatives knowledge. For example, some traders will stay in a straddle for only 10 days. If the underlying does not move in 10 days, they will square up and look for another opportunity elsewhere.

What is a good price for a Straddle?

It may happen many times that there is a good opportunity for a Straddle (say the HPCL announcement) but when you look at the market to buy the Straddle, options are very expensive. Last week, we found that Calls on HPCL were quoting at 55% implied volatility when the historical volatility was in the range of 35 to 40%.

It is a difficult decision to take whether you should buy the Calls (and Puts) even though they are so expensive or not. If HPCL moves substantially, you will make a good profit even after paying an expensive price.

Some experts therefore say that the only good Options to buy are the expensive ones. The logic behind this statement is that the market already knows that something big is expected to happen and has accordingly priced the Option. If something big actually happens, you can gain in spite of the high price you paid.

On the other hand, you could play conservative and decide that you will buy Straddles only if they are reasonably priced. For example, you could have a policy where you will buy only if the Implied Volatility is within 5% of the Historical Volatility. If it is priced higher, you will not enter into a Straddle.

In the next Article, we will discuss about Strangles

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STEP-20 **OPTION GREEKS – DELTA IN DETAIL**

Can we first revise the concept of Delta again?

Yes – Delta measures the sensitivity of the Option price to the change in the price of the underlying. For example, if Satyam is currently quoting at Rs 219 and the Satyam 220 Call carries a Delta of 0.50, this implies that for every Re 1.00 rise in the price of Satyam, the price of the 220 Call will rise by Rs 0.50. A similar movement is indicated in the case of a fall in the price too.

How is Delta useful?

It is useful in several ways. In the first place, when you have bought several calls and puts as well as sold several calls and puts (on the same underlying), you may not even realize whether an upward movement is good for you or a downward movement. The Delta quickly measures your position in terms of the underlying stock and tells you what move you will gain from. Let me explain with an example. We assume that you are trading in Satyam options alone. Satyam is currently trading at Rs 219 and there are 23 working days to expiry.

Strike	Position	Delta	Volume	Portfolio Delta
220 Call	Buy	0.51	2,400	1,224
230 Call	Buy	0.37	1,200	444
220 Put	Buy	-0.49	3,600	-1,764
Total				-96

In the above table, Delta is derived from the Black Scholes calculator. As you can see from the above table, puts carry negative deltas. The implication is that if the price of Satyam goes up, the price of the Put option will move downwards.

Portfolio Delta is worked out by multiplying the delta of each option with the volume. The total Portfolio Delta is -96. This indicates that your portfolio will lose Rs 96 for every Re 1.00 upward move in Satyam and it will gain Rs 96 for every downward move of Re 1.00 in Satyam.

Does the Delta change?

The Delta certainly changes and quite rapidly at times. It primarily depends on the movement in the underlying (Satyam in our example). It also depends to a smaller extent on the number of days to expiry and the volatility in the market.

For example if Satyam moves down from Rs 219 to Rs 215 on the same day (i.e. with 23 days to expiry), the above table will appear as under:

Strike	Position	Delta	Volume	Portfolio Delta
220 Call	Buy	0.45	2,400	1,080
230 Call	Buy	0.32	1,200	384
220 Put	Buy	-0.55	3,600	-1,980
Total				-516

As you can now see, a small movement of Rs 4 in Satyam (from Rs 219 to Rs 215) has changed your portfolio Delta from -96 to -516.

What is the implication of this change in Delta?

If Satyam now moves down to Rs 214 (by Re 1.00), you will gain Rs 516 and if Satyam now moves up to Rs 216 (by Re 1.00), you will lose Rs 516.

Your portfolio is now far more sensitive to Satyam movements than it was some time ago when Satyam was quoting at Rs 219.

Is this good or bad?

If you are expecting a downward move, it is very good. But if you are expecting an upward move, you should change your option portfolio quickly as your actions are not in consonance with your view.

What is the Delta of the share itself?

The Delta of the share itself is 1. Similarly the Delta of Stock Futures is 1. This means if the price of the share goes up (or the price of the Stock Futures go up) by Re 1.00, you will gain Re 1.00 if you are a buyer and lose Re 1.00 if you are a seller.

This Delta is so commonsensical that it need not be elaborately explained. Option deltas are less than 1 as the Option prices do not move up equally with movements in prices of the underlying.

If I do not want Delta of a certain level what should I do?

Let me explain the direction of various Deltas in the following table first:

Derivative	Delta
Futures Buy	Positive
Futures Sell	Negative
Calls Buy	Positive
Calls Sell	Negative
Puts Buy	Negative
Puts Sell	Positive

Thus if your position has a negative Delta (to continue from the previous example, you have a portfolio Delta of -516), you will lose if Satyam moves up. You believe that Satyam will move up and hence this negative Delta needs to be neutralized. You could take the following actions:

- Buy a Call
- Sell a Put
- Buy Futures

All of these actions will generate positive Delta and may convert your position from negative to positive.

Why do you say 'may' convert? Why not 'will' convert?

Your current Delta is -516. We will have to see the Delta of the derivative you will be using and recalculate the Portfolio Delta after taking the action. The following table will explain the implications:

Action	Strike	Delta	Volume	Positive Delta Generated	Portfolio Delta
Buy Call	220	0.45	1,200	540	+24
Buy Call	230	0.32	1,200	384	-132
Sell Put	220	-.55	1,200	660	+144
Buy Futures	Not Applicable	1.00	1,200	1,200	+684

As you can now see, each Option carries a different Delta while Futures carry a Delta of 1. The minimum lot size on Satyam is 1,200 Units. Thus, each action will generate a different quantum of positive Delta which may or may not convert your position to a positive Delta.

How important it is to track Delta?

Tracking Delta is extremely important especially if you are taking combination positions. By combination positions, I mean if you are buying as well as selling options or futures or alternatively you are buying both calls and puts (or selling both calls and puts).

Unless you track Delta you will not be able to understand your profit potential at various price levels of the underlying which is a basic requirement for trading in derivatives. In the cash

market, you know your profits automatically. For example, if you buy Infosys at Rs 4,300 you know that if it moves to Rs 4,500 you will make a profit of Rs 200. However, with options that is not so.

How frequently should I track Delta?

If you are an active trader taking various positions continuously during the day, it is important to track Delta continuously. With each new position or with each move in the price of the underlying your Delta will change.

If you are not very active and trade say less than 2 trades a week, you should track Delta at least at the end of the day.

How does passage of time affect Delta?

The maximum possible Delta value for a Call is 1.00 while the minimum possible value is 0. For a Put, the maximum possible value is 0, while the minimum possible value is -1.

As time passes, different options react differently. Out of the money Options tend towards zero, while In the Money Options tend towards 1 in case of Calls (or -1 in case of Puts).

The following table explains the position better (Satyam at Rs 219 currently and remains at the same level):

ITM Call	Days to Expiry	Delta	OTM Put	Days to Expiry	Delta
210 Call	23	0.65	210 Put	23	-0.35
	13	0.69		13	-0.31
	3	0.83		3	-0.17
	1	0.95		1	-0.05
	0	1.00		0	0.00
OTM Call	Days to Expiry	Delta	ITM Put	Days to Expiry	Delta
230 Call	23	0.37	230 Put	23	-0.63
	13	0.32		13	-0.68
	3	0.14		3	-0.86
	1	0.03		1	-0.97
	0	0.00		0	-1.00

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STEP-21 MARGINING SYSTEM IN DERIVATIVES

Why are margins required to be paid in Derivatives Segment?

The stock exchange acts as a legal counterparty to every transaction effected in the Derivatives Segment. Thus, if the party who loses fails to pay up, the exchange is legally bound to effect payments to the party who has made profits. To ensure that it can meet these commitments, the exchange levies margins on most players in the Derivatives Segment.

What kind of margins are applicable?

In India, two kinds of margins are applicable – Initial Margin payable at the point of entering into derivative transactions and Mark to Market Margins payable on a daily basis thereafter. Both these margins are calculated using a special software program called SPAN, which was developed by the Chicago Mercantile Exchange. Hence, margins are also called SPAN Margins.

Who needs to pay margins?

Futures buyers, Futures sellers and Option sellers need to pay margins. Option buyers need not pay any margins, as Option buyers maximum losses are restricted to the premiums which they pay for anyway upfront. They cannot be more losses than the premiums and hence no margins are required.

How are Initial margins on futures calculated?

Futures margins are based on the volatility of the scrip. The formula applied is 3.5 times daily volatility in case of stock futures and 3 times daily volatility in case of index futures. Volatilities are updated on the nseindia website every day and can be reviewed by players.

For example, if the daily volatility of Satyam is 4%, Satyam futures will attract 14% margins. Both buyers and sellers are charged equal margins in the futures market. This level is the Initial Margin.

How are Mark to Market Margins on Futures calculated?

Thereafter at the end of each trading day, Mark to Market Margins will be worked out. One party will make a profit and the other party will make an equal loss. For example, if you bought 1,200 units of Satyam Futures at Rs 226 each and the closing price comes to Rs 228, you have made a mark to market profit of Rs 2. The party who has sold these Futures to you has made a loss of Rs 2. Thus, you will receive Rs 2 while the seller will pay Rs 2 through the exchange.

How are Option Margins calculated?

Option Margins are calculated by SPAN. SPAN imagines 16 scenarios of changing price and volatility levels in the underlying. It then works out the losses which the seller can suffer in each of the 16 scenarios. It then considers the worst of these 16 scenarios and calls upon the seller to pay margin equal to this maximum possible loss.

How are the 16 scenarios defined?

SPAN works out a parameter called 'Price Scan Range'. This is worked out as Price of the underlying multiplied by 3.5 times Daily Volatility. For example, if Satyam price is Rs 230 and the Daily Volatility is 4%, the Price Scan Range will be Rs 32.20 ($230 \times 4\% \times 3.5$).

Another parameter is Volatility Scan Range which has defined as 4% in India by SEBI.

16 scenarios are then defined applying Price Scan Range and Volatility Scan Range. In the Price column in the following table, Up $1/3^{\text{rd}}$ means $1/3^{\text{rd}}$ times the Price Scan Range and so on.

Volatility Up means up by 4% as defined by SEBI.

Scenario	Price	Volatility	Weight age
1	Unchanged	Up	100%
2	Unchanged	Down	100%
3	Up 1/3	Up	100%
4	Up 1/3	Down	100%
5	Down 1/3	Up	100%
6	Down 1/3	Down	100%
7	Up 2/3	Up	100%
8	Up 2/3	Down	100%
9	Down 2/3	Up	100%
10	Down 2/3	Down	100%
11	Up 3/3	Up	100%
12	Up 3/3	Down	100%
13	Down 3/3	Up	100%
14	Down 3/3	Down	100%
15	Up 2 times	Unchanged	35%
16	Down 2 times	Unchanged	35%

The values of the Options sold are worked out applying the Black Scholes Model for each of the 16 scenarios and the scenario generating the maximum loss is taken as the margin amount payable by the Seller.

As the probability of the scrip going up or down by 2 times the price scan range is very low, the weight age factor applied to the 15th and 16th scenarios is only 35%. Thus, if the loss due to the scrip going up is say Rs 50, then for the purpose of the margin, SPAN will consider only Rs 17.50 (i.e. 35% of Rs 50).

Are there any minimum margin stipulations regarding SPAN Margins?

Yes – SEBI regulations require that a minimum margin of 3% of the notional contract value should be applied if SPAN margins work out to lower than 3%.

Are there limits on the volume that can be transacted by any player in the market?

Yes, there are limits at three levels – one – market wide limit – open interest of the total market cannot exceed specified limits – two – trading member limit – the maximum limit of exposure which any trading member can go up to – and three – client limit – the maximum exposure which any client can go up to.

Are there margin implications of these limits?

Yes – if market wide open interest exceeds 80% of the market wide limits, then margin payable is twice the SPAN margin level. Further, if market wide open interest exceeds 90% of the market wide limits, then margin payable is thrice the SPAN margin level.

As a retail investor, you need to keep watch of market wide limit positions and be aware that margin requirements may suddenly double or triple. Investors may be forced to square up in a hurry if they cannot pay such high margins at a notice of practically one day.

How are these limits defined?

In our next article, we will take the limits definition and also take up a numerical example of SPAN calculations.

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STEP-22

LIQUIDITY VOLUME AND OPEN INTEREST

LIQUIDITY

Is Liquidity an issue with the derivatives market at all?

The Indian derivatives market is progressing in terms of volumes almost every month with daily volumes being in excess of Rs 3,000 crores on many days. Derivatives volumes exceed corresponding cash market volumes on most trading days. However, liquidity in individual counters is still not always easily found and investors need to be aware of this phenomenon.

Which stocks are more active?

While 41 stocks are traded at the NSE, one generally finds that the top 8 are liquid and the other 33 are not really liquid all the time.

Which options do you find actively traded?

In case of options, we find that while the ATM options are traded in most counters, the liquidity in ITM and OTM options is very poor. Further, on most days, puts are less liquid than calls.

Which series is more active?

Most of the volumes are concentrated on the near month series. For example, currently in April, you will find that April series is most traded while the May and June series are hardly traded. Broadly speaking, 90% of the volumes are found in the near month series. The middle month series picks up in the last trading week towards expiry as traders roll over their positions.

What kind of bid ask differences are found in illiquid items?

As an investor or trader, you may find in the less liquid products that you face very high bid ask differences. For example, your computer might show 1.25 – 4.00. As a buyer, you will need to pay Rs 4 while as a seller you will get only Rs 1.25 for this product. Faced with such bid ask differences, whatever strategies you might have formulated, you may not reach the desired profit levels in spite of your views being quite correct.

The following table provides you with volumes for 31st March 2003 along with volumes in the top 8 counters. You can observe that the top 8 counters constitute 81% of the market volumes.

TABLE 1

Symbol	Contract Value (Rs Crores)
SATYAMCOMP	455
INFOSYSTCH	380
NIFTY	370
RELIANCE	135
DIGITALEQP	103
SBIN	96
TESCO	94
HINDPETRO	93
TOTAL OF 8 SCRIPS	1,726
VOLUME FOR THE DAY	2,137

VOLUMES

What is the significance of Volumes?

Futures Volumes are important if you are analyzing the strength of the movement of the scrip. If you find that the price has risen on a particular day and the Volumes on that day are also significant then the rise in the price can be understood as a strong trend. On the other hand, if the price has risen, but Volumes have not been strong, then the rising trend might not be strong enough which might imply that the rise might be negated tomorrow.

What is significant volume in this context?

The exact understanding of significant volume is based on the average volumes seen in that scrip during that relevant period. For example, if the average futures volume on Satyam has been Rs 150 crores and on that day a Volume of Rs 200 crores was seen with a rising price, one would believe that it is a strong Volume. In a relatively less active scrip, even a Volume of Rs 100 crores might be very significant.

I would suggest that you should consider the average Volumes of the last fortnight and any Volume level higher than 20% of the average should be considered significant. These are broad parameters and might require refinement from time to time.

Which Volume should you consider in this context?

Volume in this context should include Cash market volume, Futures Volume as well as Options Volume. In the case of Options, it might be appropriate to consider Call Option Volume minus Put Option Volume as the net Volume.

How do we interpret Option Volumes?

The general market practice is to assume that Call Writers are relatively skilled players who know how to read the market better and that Call Buyers are relatively simple investors. From this background, Call Writers are neutral to bearish while Put Writers are neutral to bullish. Thus Call Volumes would imply bearishness and vice versa.

This understanding might not be always correct and hence one needs to exercise judgment. For example, in a bullish market, the Call Writers might convert to Call Buyers. Further, many Writers might hedge themselves using Futures. A Call Writer might buy Futures if the market starts moving up substantially and create an upward hedge on the stock.

OPEN INTEREST

What is Open Interest?

Open Interest is the outstanding position in the Futures and Options segment. For example, if the Open Interest in Satyam Futures is Rs 200 crores, it implies that buyers and sellers who have transacted till this moment and have not yet squared up their positions have these many transactions open at the moment.

What does this imply?

The outstanding positions in the market should be read along with price trend and the volume trend. A rising price along with rising Volumes and a rising Open Interest will be a strong bull signal. Open Interest implies that fresh positions are being taken up, which might imply that fresh investors are entering the market or that existing players are increasing their position levels. On a rising trend, this indicates a strong upward move.

What do Options Open Interest positions imply?

High Call Option Open Interest would indicate bearishness while High Put Option Open Interest would indicate bullishness. It is regular practice to net off the Call minus Put Open Interest numbers and analyze this trend. A rising trend (indicating more Calls Open Interest) would be indicative of impending bearishness on the scrip.

At what level are these analyzed?

Most traders analyze them at scrip level. For example, you could total up the Satyam Calls Open Interest and Satyam Puts Open Interest and analyze the Net Open Interest levels. Some traders analyze it for the Index. Still others total up all underlying scrips and the index and work out the Net Open Interest for the market as a whole.

I would however believe that it would work best at scrip level and the index level separately. Sometimes, Calls Volumes and Open Interests are so low that they may not merit any inference.

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STEP-23 RISKS IN DERIVATIVES TRADING

Question: What are the risks involved in Derivatives Trading?

Answer : Investors and traders are required to sign up a Risk Disclosure Document before they begin trading in Derivatives. This document sets out the various risks involved in this trading. These are significant and investors can lose huge amounts within a short span of time in derivatives (much more than possible losses in the cash market given similar invested amounts).

Question : How practical is this issue on a day to day basis?

Answer : Risk is a very live issue as was demonstrated by the April 10th saga. On this day, we saw Infosys fall by 27% and Mastek fall by 49%. These kind of price falls are unanticipated and most investors in short positions have lost substantial amounts of money on this day.

Question : Aren't margins able to cover these situations? Is the investor not aware that his entire margin could be lost on a bad day?

Answer : Margins are designed to cover 99% of the possible losses on a single day. Technically, margins are based on a statistically calculated level of possible losses based on historical stock price movements. However, once in 100 days a disaster is technically possible where price movements can go beyond the limits set up the statistical model.

When this happens, the statistical model limits get violated. As a result, investors can lose more than their margins, brokers can lose if investors do not pay up the incremental margins and exchanges and the entire settlement system can be at risk if many brokers fail to pay up.

Question : How can margins become insufficient? Can the exchanges not foresee the maximum possible losses?

Margins are calculated in the following fashion (a simplified explanation for ease of clarity):

1. Take the daily closing prices
2. Work out the daily change in prices (termed as daily return)
3. Express this daily change in percentage
4. Work out the standard deviation of this daily change
5. Apply a factor of 3.5 to this standard deviation

A period of one year is considered for these calculations, but a weight age factor is applied in the sense that recent data is given more weight age and earlier data is given lesser importance.

The essence is that the volatility of the past one year is the basis for assuming future volatility. Now in the past one year (and more particularly in the recent past), if the volatility has been at a level of say 3% per day, then the margin would be taken at 10.5% (on the basis of $3\% \times 3.5$ times). Thus, if Infosys were trading at say Rs 4,100 a margin of 10.5% would have been collected on Infosys Futures.

Now the statistical model expects that the daily movement in Infosys would be within the range of 10.5% of the current price of Rs 4,100 (i.e. Rs 430 approx) on the next trading day. Accordingly, a margin of Rs 430 would be collected from investors (both buyers and sellers of Futures).

If Infosys moves more than Rs 430 (up or down) on the next day, the margin will be insufficient. The investor will find that the broker is calling him up the next day and asking for more margins. Brokers will find that investors need to pay up far more and they are (typically) not in a position to pay enormous amounts overnight and exchanges might find that brokers are unable to pay enormous amounts overnight either.

Thus, the entire system can be at risk in case of huge movements in stock prices.

The current system (Value at Risk Margining as it is termed) is the internationally followed practice in spite of whatever limitations it may have. At the systemic level, it is dangerous to follow this practice especially if some players have relatively large market share (which is quite possible in the Indian markets). If some large players suffer losses, the entire settlement system is at risk. Internationally, there are several players and the system is not so concentrated as it is in India and hence risk levels are much lower.

Question : Are there no circuit filters which can stop stocks from moving so much within a day?

Answer : Circuit filters are not applicable to stocks which are traded in the Futures & Options segment and to those stocks which are part of the Sensex thirty or the Nifty fifty. Hence, any level of movement is possible on these stocks.

There is instead, a market wide filter. If the entire market (meaning the Sensex or Nifty) moves up 10% or more within a day, the entire market will be closed for specified period (say half an hour or more).

On the 10th of April, the Sensex and Nifty did not move to this level (movements were less than 5%) and hence this filter did not apply.

Question : What is the lesson in all this for me, a retail investor?

Answer : If you invest in Futures (buy or sell) or you sell Options, you need to be very careful. You should be mentally prepared to lose the entire margin that you paid to the broker. Further, once in a while (rarely), you might be called upon to pay double that margin amount and hence you should be mentally prepared for such losses.

If you buy Options (calls or puts), the losses are limited to the amount of premium you invested.

If you had sold Put Options on Infosys, you could have typically earned Rs 130 on an At the Money Put before April 10, and it could have gone up all the way to Rs 1,100 on that day. Thus, you could have lost nearly 700% or more of your Option Premium Income on a single day. The story on Mastek would have been worse.

Question : Can I protect my positions in some manner?

Yes you can. Some examples can be discussed. If you buy Futures, you face a downside risk. To cut off this downside risk, you could buy Puts. For example, you could buy Satyam Futures (assuming you are bullish). But if you go wrong, to cover your possible losses you could buy a Satyam Put. Depending on how much losses you can bear, you could buy an Out of the Money Put.

If you sell Futures, you face an upside risk. You can hedge this risk if you buy Calls. This combination will eliminate this upside risk.

If you sell an At the Money Call, you could buy another Out of the Money Call and limit your losses. If you sell an At the Money Put, you could buy another Out of the Money Put and limit your losses.

Question : Would you advise such hedging on a regular basis?

A hedged strategy is certainly advisable because of the huge potential for losses. As a retail investor, you should be prepared to compromise your profits a bit in return for some protection.

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STEP-24 DERIVATIVES FOR TRADERS

How can derivatives be used by traders? How do you define traders?

In this context, by traders, we mean those who actively buy and sell in the markets on an intra-day and intra-week basis. Derivatives can be very useful to such traders and could increase their profits manifold.

For example, a typical trader might buy Satyam at Rs 185 on the view that it could go up to Rs 190 but if it goes the other way instead, he could keep a stop loss of Rs 181. Typically, the stock could go down to Rs 181, hit the stop loss and then bounce back to Rs 190 beautifully but after the trader has got out with a loss.

Instead, the trader could buy a call on the stock and pay a premium. He could then not worry about stop losses (mentally be prepared to lose the premium). Thus, even if the stock were to hit Rs 181 he would keep the position open and then liquidate when the stock reaches Rs 190. At that time, the call would have also appreciated automatically.

Thus, calls (and puts) could be used rather than stop losses with a higher efficiency level.

How would traders then project their profits?

When a trader buys Satyam at Rs 185 and wants to sell at Rs 190, he knows clearly that he would make a profit of Rs 5 in the process. In case of calls, he might have to make some more calculations.

First of all he needs to determine what to buy. If he decides to buy a 190 Call, which is available at say Rs 8 at the moment (when Satyam itself is at Rs 185), he can use the Delta to project the Call price. If the delta of the Call is say 0.45, then he could project the call price to be Rs 10.25 when Satyam were to reach Rs 190.

How is that worked out?

A delta of 0.45 implies that the value of the Call would increase by Rs 0.45 for every Re 1.00 increase in the stock. Thus if Satyam were to rise from Rs 185 to Rs 190 (i.e. by Rs 5), then the Call would tend to go up by Rs 2.25 (5×0.45). If the Call is currently quoting at Rs 8, then it would go up to Rs 10.25 at that time.

Is that not smaller than the appreciation on the stock? How do I make them comparable or equal?

The reward is only Rs 2.25 as against Rs 5 in the stock. But look at the risks too. The risk in buying the stock is Rs 185 while the risk in buying the Call is only Rs 8. Theoretically, the stock could go down to zero (thought it may never happen), while even if the Call goes down to zero, you still lose only Rs 8.

Nevertheless, if you would like to equate the payoffs, you could buy more Calls. For example, if you wanted to buy 5,000 units of the stock, you could think of buying 10,800 units of the Calls so that the payoff would be equal approximately ($5,000 \times 5 = 10,800 \times 2.25$ approx). I have taken 10,800 units because the lot size of Satyam is 1,200 units and this is the nearest lot available.

Does Delta work in real life?

Yes, Delta calculations do work in real life. Indian market does respond to the theoretical Black Scholes model in the sense that option prices change as per the underlying stock prices. However, delta based projections might not be exactly matched. For example, if your projected price is Rs 10.25, you may find in reality that the price ranges between Rs 10 and Rs 10.50. However, these small differences will be found in any market and not only in India.

You could have a bigger problem in some stocks and on some occasions, viz. illiquidity. In stocks where trading volumes are low, you might find that the bid ask numbers are say Rs 9.50 and Rs 11.25. In this case, though the price as per the Black Scholes Model is the around the midpoint of the two prices of bid and ask, as a trader, you might find difficulty in getting your projected price.

So what is the solution?

The answer lies in selecting the right stock options to trade. I would advise that you should observe which are the options where volumes are reasonable and trade only in those stocks.

What else can be done to exit the option position if the option is illiquid?

Another possibility is to neutralize the delta of the position using futures. This would amount to liquidating the position in theory but keeping it open in practice. The payoffs would be very similar and the objective would be achieved in the short run. In the medium term, you would square up both options and futures.

Can you elaborate with an example?

Suppose you bought 10,800 Satyam Calls as discussed. The Delta was 0.45 when Satyam itself was at Rs 185. Then Satyam moved to Rs 190 and Delta moved up to 0.52. Now the portfolio Delta is $10,800 \times 0.52$ i.e. 5,616. You want to square up as you are making a decent profit. However, because of illiquidity you are unable to get a fair price on the options.

You can alternatively neutralize your Delta. This means you should sell 5,616 futures – Futures have a Delta of 1. When you sell, you generate negative Delta. If you sell 5,616 Futures, you have generated -5,616 Delta. This would make your position Delta neutral (or zero Delta). Practically, you will have to sell in lots of 1,200 and thus you would sell 6,000 Futures.

By doing so, your position will neither gain nor lose with any small movements in Satyam. If Satyam goes up, Calls will generate profit while Futures will generate losses. These two will neutralize each other. If Satyam moves down, Calls will lose and Futures will gain, again neutralizing each other.

You should then wait for a good call price to emerge and at that point square up both simultaneously (most of the time lot by lot slowly).

If I am unable to square up soon, what happens?

If Satyam moves up or down sharply from the current level of Rs 190 before you can square up both the positions, you need not worry. Your profit will actually increase if it moves sharply. Your lowest profit level is the current price of Rs 190. Your Black Scholes payoff is a U shaped curve with the bottom at Rs 190 and highs on both sides of the U. Thus, even if the square up is delayed by a couple of hours or even a day, you need not worry. You stand protected irrespective of any changes in prices in that kind of short term.

If you wait for many days, that strategy would be wrong because Options would lose their Time Value and the profit would deteriorate. The Call will decay day by day and you would lose profit. Futures do not carry Time Value and would generate similar profit or loss even after lapse of time. The Delta of the position which was zero would now change due to Call Delta values changing by elapse of Time.

While within a day, such a change would be negligible, if the position is open for 5 days or more, the change would be significant. Hence, this strategy is applicable for traders who would exit soon but are unable to exit at the moment.

Can you summarize our discussions so far?

We have been discussing how derivatives can be used by traders. We have discussed the importance of Delta in projecting profits. We have also discussed how Delta neutralization could help in exiting positions which are otherwise illiquid.

If a trader is bearish what should he do?

Suppose you are bearish on Infosys, you could short sell in the cash market. However, you will have to square up on the same day. If you do not square up on the same day, you will have to ensure delivery. If you do not possess the shares, then questions of auctioning etc will emerge which can result into major mishaps without delivery.

How can I use the derivatives market for this purpose?

Hence, you can sell futures if you are bearish. In case of futures, you do not need any delivery. You will need to pay up a margin as per exchange regulations. Further, every day your position is marked to market and accordingly a daily profit or loss is computed by the exchange. All profits will be paid to you and losses recovered from you for each trading day separately.

If you sell futures, you should keep your stop loss limits vigorously in the same manner as you would act in the cash market. The principles of stop losses would be the same as you follow in your regular trading strategy. Some traders keep an 'x' % stop loss, some follow a trailing stop loss etc. Some traders might follow an indicator like a moving average or an oscillator to decide their stop losses.

Futures are fairly liquid in the leading counters and you might even find that futures volumes are higher than cash market volumes in some scrips. The Nifty recently recorded a turnover of over Rs 1,000 crores and the total turnover reached over Rs 5,900 crores this month, making it a record till date.

Most experts are fairly confident that turnover levels of Rs 8,000 crores per day are not far off.

Are futures sufficient for bearish trading?

Futures are sufficient for bearish trading if you have the necessary skills, aptitude and patience. However, as options are also available, it will be to your advantage if you can use them skillfully. However, all your trading skills can sometimes be severely tested on overnight basis.

You found your bearish assumption coming true and you have made some profits today evening on a mark to market basis. However, tomorrow morning the scrip opens high and moves up higher resulting in losses for you. What do you do? You can punch in a Good Till Cancelled Buy order at a predetermined (stop loss) price. However, the risk here is that early morning trades are sometimes choppy, irrational and unrelated to the direction taken by the scrip during the rest of the trading hours. In such cases, you sometimes may find you're your stop loss got hit and you got out, only to find the stock resuming its southward direction again.

In such cases, option usage is far superior.

What should I do using options?

If you are bearish, you could buy put options. In the Indian market, only the current series is active and hence you should buy only current series. In the last week of the month, the next month series also becomes active (especially from Tuesday onwards).

Which strike should I buy?

The strike to buy depends on how bearish you are. For example, you are bearish on Infosys and Infosys is currently trading at Rs 3,590. If you are very bearish, you should buy a lower strike like 3300 or 3200, which will be available cheaper. If you are mildly bearish, you should buy a current strike like 3600 or 3500 which will be more expensive.

If Infosys moves down slightly (say to 3500 or so), you will find that the current strikes respond well and they move up well. The far out strikes like 3300 or 3200 will not move too much. However, if Infosys moves down significantly to say 3300 levels, then the appreciation of the far out strikes will be very attractive, especially when you calculate in percentage terms.

Are there other strategies like bear spreads?

Yes, there are other strategies like bear spreads in which you buy a current strike (say 3600) and sell a far out strike (say 3300). In this case, you pay a high premium for the current strike but recover some of it from the sale of the far out strike. Thus, your net cost is lower.

However, there are three issues associated with such spread trades. One, for each trade, you bear the impact cost and the bid ask difference and secondly, you bear the brokerage. If you increase the number of transactions for each trade, you end up with lesser profits. Thirdly, you will find that the bear spread does not respond well to dropping scrip prices if the number of days to expiry are high. The bear spread creates profits only towards the end of the contract, in most cases. Thus, if Infosys were to move down and then bounce back up and remain up, you might find that you could not book your profits well and ultimately lost because it closed on the upside.

Therefore, I would advise you to be careful with spreads.

How many puts should I buy?

The volume of trading is a matter of personal preference, risk profile and capital available for trading. However, let us create a framework for comparing oranges with apples. Suppose, you would have sold on the cash market 1000 Infosys shares on your bearish assumption. How much is the risk you are taking in this market?

Technically, the risk is measured using a VaR model which indicates the maximum move that Infosys might move up or down in a given time period. Say the daily VaR of Infosys is 3.5% and you are considering one month as the time frame. Then effectively, the risk involved in a month is roughly around 18%. If Infosys is currently at 3590, then you are willing to lose up to 18% of this level in a month's time, which would come to Rs 6.46 lakhs on the volume of 1,000 shares.

In such a case, you could use your funds to buy puts to the extent of Rs 6.46 lakhs. If the current ATM Put is available for say Rs 180, you could buy 3,600 puts approx for that value.

But I may not suffer that kind of losses!

Yes, that is true. While technically Infosys could move up by 18% during the next month, you might not wait that long. You could for example, stop out your trade at a 3% stop loss level. In that case, your maximum loss is only 3% of 3590, i.e. Rs 1.08 lakhs on the 1,000 shares volume.

You could in this case, invest slightly more than this amount (say 100% more) i.e. Rs 2.16 lakhs on buying puts. If you buy ATM Puts at Rs 180 each, you could get 1,200 puts for this value.

Why 100% more?

This is a subjective addition because even if Infosys were to move up by 3% in this trade, the puts will still trade at some value. The value of the Puts will not go down to zero. Thus, even if Infosys moves up to say Rs 3,698, you will find that the Puts are still trading at say Rs 120 or even higher. Your loss therefore will be relatively smaller as compared to futures.

How do I estimate my profits from trading?

As a day trader, the expiry graph that we normally try to figure out profits from, is not applicable. You will have to apply delta to estimate your profits. Let us continue our same example.

The 3600 Put given Infosys price of 3590 and expiry days as 30 and a current volatility level of 43% provides a price of Rs 180 approx on the Black Scholes calculator. The delta is -0.48. Thus, if you buy 1,200 puts, your position delta will be -576. Puts naturally carry a negative delta. The implication for put buyers is that with Infosys moving down, their Put values will move up and hence puts are negatively correlated with Infosys prices.

Now, if you project that Infosys will move to 3400 in 10 days time, use the Black Scholes calculator and find out the put prices at that time. The put will quote at Rs 262 at that time. Thus, you will make a profit of Rs 82 per put, i.e. Rs 98,400 on your position of 1,200 units.

Can I use Delta for profit projections?

Yes, you can. But Delta projections do not work in this example because, Infosys movement is significant (from 3590 to 3400) and secondly, the time taken is also significant (10 days). In such cases, delta itself will change and hence cannot provide a good answer. For example, Delta math would have told you that if Infosys moves down by 190 points, the Put value would move up by 190×0.48 i.e. Rs 91. However, it is expected to move up by Rs 82 (a difference of around 10%). The principal factor here is the passage of 10 days time where Puts would lose their Time Value. The Time Value factor is not captured by the Delta math.

When can I use Delta math?

If you are trying to project the price of the Put within a shorter span of time (say 1 days) and for a smaller movement of Infosys (say from 3590 to 3550), then Delta math would be quite accurate. In this case, the Delta math would indicate that the price of the Put would increase by Rs 18 approx (40 point downward move in Infosys multiplied by 0.48 delta). The calculator also provides the price of the Put to be around Rs 200.

How do I get the Black Scholes calculator as well as the Greeks on a continuous basis?

I would suggest that you should have a derivatives trading software with you which would provide you with your Greeks on a continuous basis for your positions. It is difficult to work out the Greeks on your calculator or on excel. A software is an important tool for an active trader.

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STEP-25

PREMIUM *Khanewala*

Who is a Premium *Khanewala*?

In India, options have existed since many years and Indian options market has its own dictionary. Option writers are typically called as *Khanewalas*, and Option buyers are known as *Laganewalas*. The import is that Option writers 'eat away' the premiums they earn, while Option buyers apply their funds towards purchasing possibly valuable rights of appreciation or depreciation in stock prices.

Players who consistently write Options and believe in eating up premiums most of the time are known as *Khanewalas*.

Is that not a high risk proposition?

Yes, that is a high risk proposition, but some players like risk, can handle risk and have the knowledge and wherewithal to hedge their positions if risk rises beyond acceptable levels. For such players, premium *khana* is an exciting lunch.

How are premiums determined and what level of premiums can be exciting for such players?

One of the key determinant of Option prices is the volatility in share prices. If prices are volatile, Option prices tend to move higher. Further, if the market is trended and most players are of the opinion that market is moving up, then demand for calls will rise. When demand rises, buyers will be willing to pay a higher Option price resulting in higher implied volatility levels. When call volatility levels rise, put prices also rise sympathetically.

What is meant by volatility and how can prices of options rise in a volatile market and also in a trended market?

Yes, it does appear that Option prices react by moving up in rather dissimilar situations, viz – one – when the market is volatile and – two – when the market is trended. Let us understand volatility. If market is moving up and down, up and down severely, volatility levels will go up. In such a situation, option prices will also be higher.

Buyers of options are likely to gain more if prices move up or down (up for call buyers and down for put buyers). Hence, they are likely to pay more premium causing a rise in prices.

If the market is trended, most players will look for further movement in the direction of the trend and hence be willing to pay higher for options in that direction.

Why should put prices rise if call prices rise?

There is a basic put call parity equation. As per text books on the subject, cash market prices are taken to define this equation. However, I believe text books adopt that approach because stock futures are not available (or till recently were not available in most developed countries). In India, this put call parity equation can be defined as under:

Strike Price + Call Value – Put Value = Futures Price

This should be true. For example if Satyam 220 strike call is available for Rs 9 and put for Rs 12, then Satyam Futures price should be Rs 217 (220 + 9 – 12).

If that is not so, what will happen?

If that is not so, an arbitrage opportunity will arise and prices will start moving in such a way that the above equation becomes valid. For example, if Satyam is available not at Rs 217 but at Rs 214, then arbitrageurs will buy the right hand side of the equation and sell the left hand side of the equation.

That is, they will take the following actions:

1. Buy Satyam Futures at Rs 214
2. Sell Satyam Calls at Rs 9
3. Buy Satyam Puts at Rs 12

4. Net Cash outflow on day of transacting Rs 3
By doing so, they would have made a risk free profit of Rs 3.

How will that be achieved? Satyam could move to say Rs 240 by the close of the month or Rs 180 by the close of the month.

Let us examine the two situations closely. Suppose Satyam moves to Rs 240, what is the payoff?

1. Satyam Futures – Profit of Rs 26 (240 closing price minus 214 cost)
2. Satyam Calls – Payout of Rs 20 (240 closing price minus 220 strike price)
3. Satyam Puts – No payout (Satyam closes above 220)
4. Net Cash Inflow – Rs 6
5. Net Cash Outflow on Day of transacting – Rs 3
6. Hence, Net Profit – Rs 3

On the other hand, if Satyam moves to Rs 180, what is the payoff?

1. Satyam Futures – Loss of Rs 34 (180 closing price minus 214 cost)
2. Satyam Calls – No Payout (Satyam closes below 220)
3. Satyam Puts – Receipt of Rs 40 (220 Strike minus 180 Closing)
4. Net Cash Inflow – Rs 6
5. Net Cash Outflow on Day of transacting – Rs 3
6. Hence, Net Profit – Rs 3

Thus, irrespective of wherever Satyam moves, the arbitrageur will make a profit of Rs 3.

What if the left hand side of the equation is lower?

Consider a situation where call and put prices are the same as above, but Satyam futures are quoting at Rs 219.

In this case, the arbitrageur will buy the left hand side of the equation and sell the right hand side. That is, he will take the following actions:

1. Buy Satyam Call at Rs 9
2. Sell Satyam Put at Rs 12
3. Sell Satyam Futures at Rs 219
4. Net Cash Inflow on Day of transacting : Rs 3

What is the assured profit and how do we establish it if Satyam moves to say Rs 245 or Rs 195 at close of the month?

The assured profit is Rs 2 (as per the equation Satyam Futures should have quoted at Rs 217, but it is actually quoting at Rs 219 – hence the difference is Rs 2).

If Satyam closes at Rs 245, let us check the payoff on the last day.

1. Satyam Futures – Loss of Rs 26 (219 sale price minus 245 closing price)
2. Satyam Calls – Receipt of Rs 25 (245 closing price minus 220 strike)
3. Satyam Puts – No Payout (Satyam closes above 220 strike)
4. Net Cash Outflow – Re 1
5. Net Cash Inflow on Day of transacting – Rs 3
6. Hence, Net Profit – Rs 2

If Satyam closes at Rs 195, let us check the payoff on the last day.

1. Satyam Futures – Profit of Rs 24 (219 sale price minus 195 closing price)
2. Satyam Calls – No Payout (Satyam closes below 220 strike price)
3. Satyam Puts – Payout Rs 25 (220 strike minus 195 closing price)
4. Net Cash Outflow – Re 1
5. Net Cash Inflow on Day of transacting – Rs 3
6. Hence, Net Profit – Rs 2

What does this establish?

The put call parity equation establishes that call and put prices have to move together in a disciplined manner. In any given market, if call prices shoot up (due to trending, higher volatility, expectations of any news or any other factor), put prices will necessarily respond.

What are the risks in the put call parity arbitrage that we discussed above?

The first risk is execution risk. While the computerized trading systems may show the prices as in my example, the prices might change with fraction of a second, so that when you actually execute you do not get the arbitrage difference as expected. You might get slightly less or sometimes even more.

Secondly, if you have sold calls or puts, these might be exercised sometime before expiry. In that case, you will receive the exercise notice after the close of trading hours. You will have to reinstate the same position in the morning tomorrow, but by that time the scrip might have moved away. This could result in a cost (or a gain), but in any case you face overnight risk.

Third, such arbitrages are not easily available and you need to watch the market closely.

Fourth, such arbitrages might not be available in large volumes. Hence, if you are a large player, you might find not enough opportunities on a regular basis.

What does the *Khanewala* desire?

The *Khanewala* desires that he should sell options when volatility levels are high so that his premium income is maximized. He will be delighted if volatility levels fall after he completes his sales.

Most *Khanewalas* look at Option prices in a simplistic manner taking the Option prices as a percentage of the stock prices. They might for example comment that Satyam calls are generating 4% premium per month and this is interesting. Some people equate this with earning interest on a principal so to say and a 4% monthly return might translate into a 48% annual return which is very exciting considering other investment avenues available today. Obviously, this is a simplistic method of looking at premiums but is done commonly.

How is this simplistic percentage return related to volatility?

If we run a simulation on Black Scholes, taking a 30 day period to expiry and a zero percent interest rate, the following interesting pattern emerges:

Implied Volatility %	Option Premium % to Stock Price	Incremental Option Premium %
15%	1.72%	
20%	2.29%	0.57%
25%	2.86%	0.57%
30%	3.43%	0.57%
35%	4.00%	0.57%
40%	4.57%	0.57%
45%	5.14%	0.57%
50%	5.71%	0.57%
55%	6.28%	0.57%
60%	6.85%	0.57%

Thus, the simplistic Option Premium increases by 0.57% for every 5% point increase in Implied Volatility.

What is Implied Volatility?

In the Black Scholes model, Option prices are based on six variables:

1. Stock Price
2. Strike Price
3. Volatility
4. No of Days to expiry
5. Interest Rate
6. Dividends

The current Option price would reflect a certain level of Volatility automatically. This level of Volatility is said to 'implied' in the Option price. For example, if Satyam is at Rs 217 and the 220 Call trades at Rs 9 when there are 30 days to expiry with a Interest rate of zero percent and a dividend of zero, then what is the volatility level which results in the price being Rs 9? If you run it on the Black Scholes calculator, you find the volatility is 42%. This 42% is the Implied Volatility.

Is there any other kind of Volatility?

Yes, the volatility actually shown by the stock in the past is called Historical Volatility (also referred to as Statistical Volatility by some people). This is based on the actual movement in the stock over a certain period of time. For example, you could take up the movements over the past ten days and work out the volatility level.

Technically, the steps involved are as under:

- Put down the stock prices in an Excel column
- Work out the daily change in prices (today's price minus yesterday)
- Express the daily change in percentage terms (Daily change upon yesterday's price)
- Work out the standard deviation of this daily change percentage column

The resulting figure is the ten day volatility of Satyam.

Is there a relationship between the two?

Yes, there would be a vague positive correlation between the two indicating that if Satyam has been volatile in the recent past, the market will expect it to stay volatile in the short term and hence options will be quoting higher. On the other hand, if Satyam has been rather dull in the recent past (ten days in our example), market will expect no great moves immediately and hence option premiums will drift downwards.

However, if some news is expected, market will start factoring this into the premium and you may well find that implied volatility levels are rising in spite of dull historical volatilities. Sometimes, inside information may be acting in the market as a result of which implied volatilities might suddenly rise.

This can be a pointer to news and can be acted upon if you are active in the market.

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STEP-26

DERIVATIVES AND MUTUAL FUNDS

What is the level of institutional participation in Derivatives?

Institutional participation in Derivatives is limited in spite of a huge turnover level in this segment. This phenomenon is indeed surprising but true. The Finance Ministry and the Government were initially of the view that derivatives would be dominated by institutions. However, the reverse has happened. It is the retail crowd with the High Net Worth individuals and the broking proprietary positions that has dominated the Derivatives segment in India completely unlike the developed markets where institutional participation is the key driver of these markets.

While each of the institutional segment possibly have their reasons for not joining the band wagon, in recent months, Foreign Institutional Investors (FIIs) have become an important participating community. This is related to the fact that investments in the cash market by FIIs has increased considerably this year and to the rupee being stable and growing stronger against the dollar. It is also widely believed that FIIs have taken significant arbitrage positions in the cash and carry (buy cash, sell futures) trades.

Are Mutual Funds allowed to invest in Derivatives?

The first SEBI Committee on Derivatives headed by Chairman Shri L C Gupta recommended that Mutual Funds be allowed to enter into the derivative segment for the purposes of hedging and portfolio balancing. The report defined in detail the meaning of hedging and provided a fairly liberal scope for mutual funds in hedging. Subsequently, a SEBI circular on the subject reiterated the same scope for Mutual Funds. However, fund houses were not too keen to trade possibly because the definition was not very clear.

What is the position now?

Due to confusion about the scope of hedging and portfolio balancing, SEBI issued a Circular on 31st December 2002 which elaborated more on the understanding on the subject. Some confusion still prevails but the Circular does provide more light than before.

What is hedging as per the latest Circular?

Assume you are a Mutual Fund with a holding in Infosys and that you hold 10,000 shares. You are allowed to sell Infosys Futures to the extent of 10,000 units. You are also (alternatively) allowed to buy Infosys Puts to the extent of 10,000 units.

You can also use Index Futures or Index Puts (whether you hold index stocks or other than index stocks). The SEBI Circular provides that you can sell Index Futures or buy Index Puts to the extent of Portfolio Value multiplied by Portfolio Beta. For example, if you hold a portfolio of Rs 200 crores and a beta of 1.21, you can use Derivatives for a notional value to the tune of Rs 242 crores. It has been clarified you can use Index Futures or Index Puts to the same extent of Rs 242 crores of notional value. Any excess positions would obviously not be justified as that would amount to a speculative position.

It has been made clear that you cannot hedge Infosys long position by selling any other stock futures (e.g. Reliance), nor can you sell a diversified equity position by selling a sectoral index futures contract. For example, if you hold Infosys, Levers, Reliance and SBI, you cannot hedge this position by selling an IT Index Futures contract. These are logical limitations which make eminent sense.

It has further been stated that you can sell covered calls to the extent of notional value of stocks held. It is interesting to know that even covered calls are included under the definition of hedging. It is clarified that the notional value of covered calls sold cannot exceed the value

of the underlying portfolio. This is a fairly liberal definition and fund managers should be happy to see this provision.

The L C Gupta Committee had considered the concept of hedging cash, which unfortunately has not been elaborated upon by this Circular. That Committee had stated that if a mutual fund has collected cash from its unit holders and is concerned that if it starts buying stocks immediately, it would involve a rather huge impact cost, and the mutual fund could first buy futures. Slowly it could unwind its futures positions and buy cash positions instead. This kind of anticipatory hedging would also be allowed as per the Committee.

What is portfolio balancing?

The Circular defines portfolio balancing in a rather peculiar manner. It declares that if a mutual fund can create a position using derivatives which equates with a position similar to a cash position, then such a derivatives strategy should indeed be followed as a matter of good practice so long it creates a position at a lower cost for its unit holders. The Circular states that the mutual fund is working in a fiduciary capacity for its unit holders and is obligated to follow a strategy that lowers its cost of acquisition.

Thus, if the mutual fund desires to acquire shares of Infosys and finds that Infosys futures are quoting at a low cost of carry, it should buy Infosys futures, invest the surplus funds left in the money market and earn the cost of carry and convert the futures position into cash position at the expiry (or any time before the expiry) of the futures contract. This strategy would reduce the cost of acquisition of Infosys for its unit holders.

If a fund can improve upon a buy-and-hold strategy by selling a stock or an index portfolio today, investing the proceeds in the money market, and having a locked-in price to buy it back at a future date, then it would have a fiduciary obligation to do so.

What else can the mutual fund do?

It is surprising that the Circular provides for complex possibilities which appear to go beyond hedging and portfolio balancing. It provides that the mutual fund could buy calls, sell calls, buy puts and sell puts which literally opens the entire world of options to the mutual fund industry. It does provide for some limits on the maximum limits up to which such complex positions can be taken, but the limits are likely to be fairly liberal and hence should be a welcome signal for fund managers.

What limits have been defined for complex positions?

We are reproducing an example from the Circular which will enable you to appreciate the limits laid down for complex positions. Considering the following stock option strategy:

- a. Long call options on 5 million shares at a strike price of Rs 80.
- b. Long put options on 2 million shares at a strike price of Rs 90
- c. Short call options on 1 million shares at a strike price of Rs 110
- d. Long put options on 3 million shares at a strike price of Rs 120
- e. Long call options on 4 million shares at a strike price of Rs 130
- f. Short call options on 3 million shares at a strike price of Rs 140

Since the fund has a bullish position on 9 million shares (a plus e) and a bearish position on 9 million shares (b plus c plus d plus f), its option delta could be comparatively small especially when the stock price is not far from the weighted average strike price. However, depending on what the stock price turns out to be at expiry, only some of the options will end up in the money and will therefore get exercised by or against the fund. Consequently, the fund could end up with a long or short position in the stock at expiry depending on what the stock price turns out to be at that point of time.

The worst case long and short exposures can be worked out as follows:

Price at expiry	Options that end up in the money and therefore get exercised by or against the fund	Net number of shares (short or long) the fund ends up holding as a result of the option exercises
Below 80	b and d	5 million shares short
80-90	a, b and d	nil
90-110	a and d	2 million shares long
110-120	a, c and d	1 million shares long
120-130	a and c	4 million shares long
130-140	a, c and e	8 million shares long
above 140	a, c, e and f	5 million shares long

The worst case short exposure arises when the share price at expiry is below 80 and the fund ends up delivering 5 million shares to exercise the in-the-money puts. This would be an acceptable level of hedging only if the fund's position in the underlying and the futures were at least 5 million shares.

Its worst case long position (8 million shares) is when the share price is above 130 and below 140. The fund receives 9 million shares from exercising its in-the-money calls (a and e) and delivers 1 million shares against its short calls (c) which are also in the money. This means that the fund can take up this option strategy only if this 8 million shares plus its position in the underlying shares and futures is together less than the maximum permissible limit for the fund's holding in the stock.

The fund must therefore satisfy two conditions before it can take up this option strategy as part of "hedging and portfolio rebalancing":

- the fund's position in the underlying and the futures must be at least 5 million shares so that the position does not become over-hedged
- the fund's existing position in the underlying shares and futures plus the 8 million shares worst case long exposure of the option strategy must together be less than the maximum permissible limit for the fund's holding in the stock

Some fund managers may regard the worst case exposure analysis as an excessively harsh view of what they might consider a legitimate and relatively low risk derivative strategy. In particular, it might be objected that the worst case long exposure of 8 million shares should be treated more leniently since it applies only in a narrow range of share prices (130-140). The Committee is however of the view that even if strategies of this kind are attractive and low risk ways of creating and profiting from gamma and Vega exposures to a stock, the creation of such exposures does not per se constitute "hedging and portfolio rebalancing". To justify the strategy in a "hedging and portfolio rebalancing" framework, it is necessary to show that the worst case short position resulting from the strategy is an acceptable hedging activity and that the worst case long position resulting from it is an acceptable portfolio rebalancing activity.

Will mutual funds trade more in future?

It is widely accepted that with FIIs entering the derivatives market in a significant way, other institutions will also start coming forward. The systems for risk management followed in the derivatives industry have so far proved quite robust and will encourage larger players to trade. Mutual funds have been given a liberal scope by the above SEBI pronouncements and it can be expected that funds will trade more in the coming months.

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STEP-27 **FII's and Derivatives**

Are FIIs allowed to invest in derivatives?

Yes, FIIs are allowed to invest in equity derivatives as per SEBI guidelines. SEBI had issued a circular on 12th Feb 2002 wherein the regulations in this regard have been specified.

Initial RBI approval

RBI had vide circular EC.CO.FII/ /11.01.01(16)/2000-01 dated August 7, 2000 permitted FIIs to trade in exchange traded index futures contracts on the Derivative Segment of BSE and the F & O Segment of NSE provided the overall open interest of the FII would not exceed 100% of market value of the concerned FII's total investment

Further SEBI Guidelines

The SEBI Board vide meeting dated December 28, 2001 has permitted FIIs to trade in all exchange traded derivative contracts and laid down the position limits for the trading of FIIs and their sub-accounts. RBI vide circular ECO.CO.FII/515/11.01.01/(16) 2000-01 dated February 4, 2002 permitted FIIs to trade in all the exchange traded derivative contracts subject to the position limits prescribed hereunder. The FIIs shall be under obligation to adhere to the position limits prescribed for them and their sub-accounts. The FIIs shall also comply with the procedure for trading, settlement and reporting as prescribed by the derivative exchange / Clearing House / Clearing Corporation from time to time.

Position Limits

The position limits for FII and their sub-accounts shall be as under:

I POSITION LIMITS

At the level of the FII

- In the case of index related derivative products there shall be a position limit at the level of FII at 15% of the open interest of all derivative contracts on a particular underlying index or Rs. 100 crores whichever is higher, per exchange.
- The FII position limit in derivative contracts on a particular underlying stock would be at 7.5% of the open interest of all derivative contracts on a particular underlying stock or Rs. 50 crores whichever is higher, at an exchange.

At the level of the sub-account

- Each Sub-account of a FII would have the following position limits:
- A disclosure requirement for any person or persons acting in concert who together own 15% or more of the open interest of all derivative contracts on a particular underlying index.
- The gross open position across all derivative contracts on a particular underlying stock of a sub-account of a FII should not exceed the higher of:
 - 1% of the free float market capitalization (in terms of number of shares).
 - or
 - 5% of the open interest in the derivative contracts on a particular underlying stock (in terms of number of contracts).

This position limits would be applicable on the combined position in all derivative contracts on an underlying stock at an exchange.

The Derivative Segment of the Exchanges and their Clearing House / Clearing Corporation would monitor the FII position limits at the end of each trading day. For this purpose, the Derivative Segment of the Exchanges and their Clearing House / Clearing Corporation would implement the following procedure for the monitoring of the FII and the sub-account's position limits:

1. The FII would be required to notify the names of the Clearing Member/s and Custodian through whom it would clear its derivative trades to exchanges and their Clearing House / Clearing Corporation.

2. A unique code would be assigned by the exchanges and / or the Clearing House / Clearing Corporation to each registered FII intending to trade in derivative contracts.
3. The FII would be required to confirm all its positions and the positions of all its sub-accounts to the designated Clearing Members online but before the end of each trading day.
4. The designated Clearing Member/s would at the end of each trading day would submit the details of all the confirmed FII trades to the derivative Segment of the exchange and their Clearing House / Clearing Corporation.
5. The exchanges and their Clearing House / Clearing Corporation would then compute the total FII trading exposure and would monitor the position limits at the end of each trading day. The cumulative FII position may be disclosed to the market on a T + 1 basis, before the commencement of trading on the next day.
6. In the event of an FII breaching the position limits on any derivative contract on an underlying, the FII would not be permitted by the exchanges and their Clearing House / Clearing Corporation / Clearing Member/s to take any fresh positions in any derivative contracts in that underlying. However, they would be permitted to execute off-setting transactions so as to reduce their open position.
7. The FIIs while trading for each sub-account would also assign a unique client code with a prefix or suffix of the code assigned by the exchange and their Clearing House / Clearing Corporation to the FII. The FII would be required to enter the unique sub-account code before executing a trade on behalf of the sub-account.
8. The sub-account position limits would be monitored by the FII itself, on the same lines as the trading member monitors the position limits of its client / customer. The FIIs would report any breach on position limits by the sub-account, to the derivative segment of the exchange and their Clearing House / Clearing Corporation and the FII / Custodian / Clearing Member/s would ensure that the sub-account does not take any fresh positions in any derivative contracts in that underlying. However the sub-account would be permitted to execute off-setting transactions so as to reduce its open position
9. The exchanges may assign unique sub-account codes on the lines of unique client codes to each sub-account of a FII, which would enable the derivative segment of the exchange and their Clearing House / Clearing Corporation to monitor the position limits specified for sub-accounts.

II COMPUTATION OF THE POSITION LIMITS

The position limits would be computed on a gross basis at the level of a FII and on a net basis at the level of sub-accounts and proprietary positions.

The open position for all derivative contracts would be valued as the open interest multiplied with the closing price of the respective underlying in the cash market.

Have FIIs been active participants since Feb 2002?

FIIs were inactive during the whole of 2002 and for the first 5 months of 2003 also. The equity markets were during this phase passing through a dull phase. Once the markets started moving up smartly, FII action has emerged in the derivatives markets along with an increasing exposure in the cash market itself.

The current position of FIIs as of 20th October 2003 is as under:

Details	Buy		Sell		Open Interest at the end of the day	
	No. of Contracts	Value (Rs in crs)	No. of Contracts	Value (Rs in crs)	No. of Contracts	Value (Rs in crs)
Index Futures	469	14.54	783	24.35	12590	388.25
Index Options	0	0.00	72	1.94	1953	60.26
Stock Futures	689	34.99	1924	68.73	69772	2623.48
Stock Options	5	0.10	5	0.19	693	25.

Source : www.sebi.gov.in

Open Interest positions of FIIs constitute 10 – 15% of the total market open interest positions these days. On 21st October 2003, FII Open Interest constituted 15.71% of the total market open interest position (source www.nseindia.com).

Why this interest in derivatives?

Derivative volumes and consequential liquidity is interesting these days. Derivative volumes touch upwards of Rs 10,000 crores per day, which is higher than the cash market volumes of both exchanges NSE and BSE put together. Hence, entry and exit is easy for FIIs. Further, advantages of derivatives as available to individual investors is any way available to FIIs also, mainly the advantage of leverage.

The strength of the rupee is a great attraction for investing in Indian markets, directly in the cash segment as well as through the derivative segment.

Is there an arbitrage play by FIIs?

Yes, it does appear that FIIs are active players in cash and carry arbitrage.

How does that work?

FIIs will buy securities in the cash market and at the same time sell corresponding futures in the derivatives market. In bullish times, stock futures trade at a decent premium to the cash market. If the premium is 10% plus on an annualized basis, that is very interesting arbitrage to the FII community who do not find such rich pastures abroad. The strength of the rupee might in some cases further add to dollar earnings, but even if the rupee remains stable, the 10% return itself is very interesting to the FII community who might be able to typically borrow at 4% or downwards.

This has increased FII interest in derivatives to a great degree. No clear statistics are available as to how much of futures positions are covered by underlying stocks. As you can see, open positions in stock futures constitute more than 85% of the total open positions of FIIs in the derivatives segment. This data seems to suggest a preponderance of arbitrage transactions.

Would FIIs continue their participation in the derivatives segment in future?

So long as futures are quoted at reasonable premiums over cash market prices and FIIs see opportunities to earn upwards of 8% annualized, one can foresee a fairly healthy participation from their side. However, it is important to understand that futures differentials have not been always attractive if we look at the past 2 years of futures history. Till around May this year, futures were quoting at nominal differentials of 3-4% and in some cases, at a discount. If this scenario were to come back (once this bullishness subsides), then the arbitrage opportunity would also disappear or at least decrease. In such a situation, one would see FIIs reducing their derivatives exposures.

Is a high level of arbitrage operation good for the market?

High levels of arbitrage operations have their good and bad effects. Arbitrage will keep prices in check and bring discipline to futures markets. If futures were to move up sharply, they would be reined in by arbitrageurs so as to maintain a meaningful relationship vis-à-vis cash markets.

However, the downside could be in bear markets or stable markets. Once the differentials narrow down to uninteresting levels, the arbitrageurs would unwind their positions. Unwinding would imply that their long cash positions would not be sold. If a big selling wave emerges as a consequence of winding down (and as at last count, the values of such stocks could be of the order of Rs 2,600 crores), then these stocks would move down. Most of these stocks are likely to be majors with a significant role in the index and hence the market as a whole could be affected.

One therefore should be careful of hot money flowing into temporary arbitrage positions and disturbing the markets on exit.

Are the FIIs working on a better turf than their Indian brothers in this arbitrage?

Yes, the FIIs have access to cheaper funds and their cost could be 4% or even lower per annum. The Indian arbitrageurs in spite of the declining interest scenario in India over the last few years, would not be able to find funds at such low rates of interest. Thus, an 8% cash and carry differential might be interesting and rewarding to an FII which the same differential might be unexciting to an Indian. I think to this extent, FII arbitrage operations will override their Indian counterparts in terms of volumes. This will lead to lesser opportunities for Indians because FIIs would snap up opportunities at 8% levels itself, leaving no scope for higher differentials which the Indians would be waiting for.

In a sense therefore, there is an uneven playing field in arbit operations, which might be beyond our control.

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STEP-28

Scrip Selection Criteria

How are scrips selected for inclusion in Derivatives Segment?

The selection of securities for trading on the Futures & Options Segment is based on the following broad eligibility criteria:

1. The security should be amongst the top 500 securities in terms of average daily market capitalization and average daily traded value during the previous six months.
2. The securities median quarter sigma order size over the last six months should be at least Rs. 5 Lakhs.

What is Quarter Sigma?

Sigma means standard deviation which is used to measure volatility in any scrip or index. Quarter Sigma order size is defined as the order size (value) required to cause a change in the stock price equal to one-quarter of a standard deviation. So if the sigma of a stock is 3%, what is the order size (value) required to make a change in the stock price equal to 0.75%?

How is the Quarter Sigma calculated?

The Quarter Sigma order size is calculated by taking four order book snapshots in a day for a security for the last six months.

The detailed procedure is outlined below:

1. The applicable VAR (Value at Risk) is calculated for each security based on the J.R. Varma Committee guidelines. (The formula suggested by J. R. Varma for computation of VAR for margin calculation is statistically known as 'Exponentially weighted moving average (EWMA)' method. In comparison to the traditional method, EWMA has the advantage of giving more weight to the recent price movements and less weight to the historical price movements.)
2. Such computed VAR is a value (like 3%), which is also called standard deviation or Sigma. (The meaning of this figure is that the security has the probability to move 3% to the lower side or 3% to the upper side on the next trading day from the current closing price of the security).
3. Such arrived at standard deviation (one sigma), is multiplied by 0.25 to arrive at the quarter sigma.
(For example, if one sigma is 3%, then quarter sigma is 0.75%)
4. From the order snapshots (taken four times a day from NSE's Capital Market Segment order book) the average of best buy price and best sell price is computed which is called the average price.
5. The quarter sigma is then multiplied with the average price to arrive at quarter sigma price. The following example explains the same :

Security	XYZ
Best Buy (in Rs.)	306.45
Best Sell (in Rs.)	306.90
Average Price	306.70
One Sigma	3%
Quarter sigma	0.75%
Quarter sigma price (Rs.) (Average Price *Quarter sigma)	2.30

- 6.
7. Based on the order snapshot, the value of the order (order size in Rs.), which will move the price of the security by quarter sigma price in buy and sell side is computed. The value of such order size is called Quarter Sigma order size. (Based on the above example, it will be required to compute the value of the order (Rs.) to move the stock price to Rs. 309.00 in the buy side and Rs. 304.40 on the sell side. That is Buy side =

average price + quarter sigma price and Sell side = average price - quarter sigma price). Such an exercise is carried out for four order snapshots per day for all stocks for the previous six months period.

8. From the above determined quarter sigma order size (Rs.) for each order book snapshot for each security, the median of the order sizes (Rs.) for buy side and sell side separately, are computed for all the order snapshots taken together for the last six months.
9. The average of the median order sizes for buy and sell side are taken as the median quarter sigma order size for the security.
10. The securities whose median quarter sigma order size is equal to or greater than Rs. 0.5 million (Rs. 5 Lacs) qualify for inclusion in the F&O segment.

Futures & Options contracts may be introduced on new securities which meet the above mentioned eligibility criteria, subject to approval by SEBI.

At what frequency are these numbers calculated?

New securities being introduced in the F&O segment are based on the eligibility criteria which take into consideration average daily market capitalization, average daily traded value and the quarter sigma values and as approved by SEBI. The average daily market capitalization and the average daily traded value would be computed on the 15th of each month, on a rolling basis, to arrive at the list of top 500 securities. Similarly, the quarter sigma order size in a stock would also be calculated on the 15th of each month, on a rolling basis, considering the order book snapshots of securities in the previous six months.

Can the stocks determined as per above criteria change almost every month?

The number of eligible securities may vary from month to month depending upon the changes in quarter sigma order sizes, average daily market capitalization & average daily traded value calculated every month on a rolling basis for the past six month.

What is the procedure for introduction and dropping of securities after arriving at the conclusions using above criteria?

Consequently, the procedure for introducing and dropping securities on which option and future contracts are traded, as stipulated by SEBI in its circular SMDRP/DC/CIR -13/02 dated Dec 18, 2002, would be as follows :

- Options and futures may be introduced on new securities when they meet the eligibility criteria and are approved by SEBI.
- If an existing security fails to meet the eligibility criteria for three months consecutively, then no fresh month contract shall be issued on that security. However, the existing unexpired contracts may be permitted to trade till expiry and new strikes may also be introduced in the existing contract months.
- The Exchange may compulsorily close out all derivative contract positions in a particular underlying when that underlying has ceased to satisfy the eligibility criteria or the Exchange is of the view that the continuance of derivative contracts on such underlying is detrimental to the interest of the market, keeping in view the market integrity and safety.

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STEP-29 DERIVATIVE ADJUSTMENTS FOR CORPORATE ACTIONS

Corporate Actions are instances where some action is taken by the company as a result of which the share price will react. Common examples are dividends, bonus, rights, stock splits, mergers and demergers. The prices of futures and options will be influenced by such actions along with the impact on prices of the underlying shares themselves. This article seeks to understand the impact on prices of futures and options and the practices which exchanges will follow to structure that impact in a transparent manner.

Principle for Price Adjustment

The basis for any adjustment for corporate actions shall be such that the value of the position of the market participants, on the cum and ex-dates for the corporate action, shall continue to remain the same as far as possible. This will facilitate in retaining the relative status of positions viz. in-the-money, at-the-money and out-of-money. This will also address issues related to exercise and assignments.

Corporate Actions to be adjusted

The corporate actions may be broadly classified under stock benefits and cash benefits. The various stock benefits declared by the issuer of capital are:

- Bonus
- Rights
- Merger / De-merger
- Amalgamation
- Splits
- Consolidation
- Hive-off
- Warrants
- Secured Premium note (SPNs) among others.

The cash benefit declared by the issuer of capital is cash dividend.

Time of Adjustment

Any adjustment for corporate actions would be carried out on the last day on which a security is traded on a cum basis in the underlying equities market, after the close of trading hours.

Adjustment

Adjustments may entail modifications to positions and / or contract specifications as listed below, such that the basic premise of adjustment laid down above is satisfied:

- | | | |
|----|-------------------------|----------|
| a) | Strike | Price |
| b) | | Position |
| c) | Market Lot / Multiplier | |

The adjustments would be carried out on any or all of the above, based on the nature of the corporate action. The adjustments for corporate actions would be carried out on all open, exercised as well as assigned positions.

Methodology for adjustment

A. Bonus, Stock Splits and Consolidations

- ☐ **Strike Price:** The new strike price shall be arrived at by dividing the old strike price by the adjustment factor as under.
- ☐ **Market Lot / Multiplier:** The new market lot / multiplier shall be arrived at by multiplying the old market lot by the adjustment factor as under.
- ☐ **Position:** The new position shall be arrived at by multiplying the old position by the adjustment factor as under.
- ☐ **Adjustment Factor:**

Bonus - Ratio A:B	Adjustment factor : $(A+B)/B$
Stock Splits and Consolidations Ratio - A : B	Adjustment factor : A/B
Rights Ratio A : B, Premium - C Face Value - D	Existing Strike Price : X New Strike Price: $((B*X) + A*(C+D)) / (A+B)$ Existing Market Lot/Multiplier/Position : Y New issue size : $Y * (A+B)/B$

- ☐ The above methodology may result in fractions due to the corporate action e.g. a bonus ratio of 3:7. With a view to minimizing fraction settlements, the following methodology is adopted :

1. Compute value of the position before adjustment
2. Compute value of the position taking into account the exact adjustment factor
3. Carry out rounding off for the Strike Price and Market Lot
4. Compute value of the position based on the revised strike price and market lot

The difference between 1 and 4 above, if any, is decided in the manner laid down by the relevant authority by adjusting Strike Price or Market lot, so that no forced closure of open position is mandated.

B. Dividends

- Dividends which are below 10% of the market value of the underlying stock, would be deemed to be ordinary dividends and no adjustment in the Strike Price would be made for ordinary dividends. For extra-ordinary dividends, above 10% of the market value of the underlying security, the Strike Price would be adjusted.
- To decide whether the dividend is "extra-ordinary" (i.e. over 10% of the market price of the underlying stock.), the market price would mean the closing price of the scrip on the day previous to the date on which the announcement of the dividend is made by the Company after the meeting of the Board of Directors. However, in cases where the announcement of dividend is made after the close of market hours, the same day's closing price would be taken as the market price. Further, if the shareholders of the company in the AGM change the rate of dividend declared by the Board of Directors, then to decide whether the dividend is extra-ordinary or not would be based on the rate of dividend communicated to the exchange after AGM and the closing price of the scrip on the day previous to the date of the AGM.
- In case of declaration of " extra-ordinary " dividend by any company, the total dividend amount (special and / or ordinary) would be reduced from all the strike prices of the option contracts on that stock.
- The revised strike prices would be applicable from the ex-dividend date specified by the exchange.

C. Mergers

- On the announcement of the record date for the merger, the exact date of expiration (Last Cum-date) would be informed to members.
- After the announcement of the Record Date, no fresh contracts on Futures and Options would be introduced on the underlying, that will cease to exist subsequent to the merger.
- Un-expired contracts outstanding as on the last cum-date would be compulsorily settled at the settlement price. The settlement price shall be the closing price of the underlying on the last cum-date.
- GTC/GTD orders for the futures & options contracts on the underlying, outstanding at the close of business on the last cum-date would be cancelled by the Exchange.

The relevant authority may, on a case by case basis, carry out adjustments for other corporate actions in conformity with the above guidelines, including compulsory closing out, where it deems necessary.

##THE END ##

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