

## Options – III

### Equity Options Strategies<sup>1</sup>

Options trading in equities has grown rapidly in India since the beginning of this century and has had a very big impact on the Indian stock markets. This chapter introduces some methods by which options can be used for hedging and speculation on equities. It should be noted that most of these 'strategies' can also be used with other kinds of options. This chapter will start with an example of a simple speculative strategy and one example of a hedging strategy before getting into more details. More advanced strategies are covered in chapter 13.

#### Speculative strategy: Long call

##### *Example 12.1*

*It is the month of May. Mohan expects to receive a bequest in July. He is bullish about SBI, and wants to buy the stock. But he does not yet have the money. He cannot use the futures contract because he would be exposed to mark to market loss: If the stock price falls by a large amount (e.g., 50 per cent), he would have to pay up, and he does not have that much money. So he buys the call option that expires after he expects to receive the cash. The call option allows him to invest in the market in anticipation of getting his bequest. Buying a call allows him to effectively own SBI stock without having all the money now. In essence, Mohan is borrowing from the writer of the call. By buying a call option, Mohan now has a 'long call'.*

*Prevailing prices are as follows:*

*Current Spot price of SBI shares (in May) = ₹ 1,900*

*Premium for July SBI Call (with 1,900 strike) = ₹ 100<sup>2</sup>*

*The pay-off for the position is, depicted diagrammatically in Figure 12.1.*

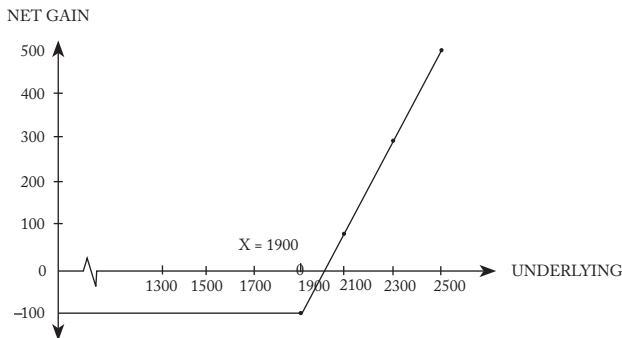
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- 1 The term 'strategy' is used in the investment analyst's sense of a set of investment transactions, rather than in the management sense of a long term plan of action.
  - 2 Assuming no dividend, and approximately 12 per cent interest, this implies an annualised volatility of 25 per cent which seems reasonable for a blue chip stock (using the Black Scholes calculator; free versions can be found online).

*Table 12.1: Pay off from long call*

<i>SBI Stock Price at expiry [1]</i>	<i>Premium paid<sup>*</sup> [2]</i>	<i>Gain on exercising the option [3]</i>	<i>Net Gain / (Loss) [4]</i>
1500	-100	0	-100
1700	-100	0	-100
1900	-100	0	-100
2100	-100	200	100
2300	-100	400	300
2500	-100	600	500

*\*Note: the value of money is ignored here.*

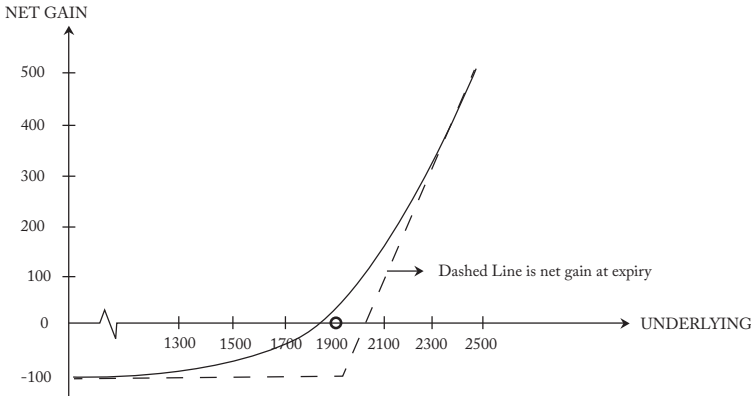
*Figure 12.1: Net gain on SBI call option at or after July expiry  
(equivalent to column [4] in Table 12.1)*



The pay-off diagram in Figure 12.1, as in Table 12.1, represents the pay-offs at the expiry date in July. If the position is closed earlier than July, the pay-offs would be different. In this case, the option would be closed by selling it rather than by exercise or by expiry unexercised. When it is sold, the selling price will always be positive (since every unexpired option has some time value even if it has no intrinsic value.) Since the selling price will be greater than zero, the net premium incurred (purchase price minus selling price) will be less than the premium paid initially. The pay-off for a closure of the position before expiry is depicted by the curved line in Figure 12.2. The pre-expiry pay-off line is a smoothed version of the expiry pay-off line. As the position approaches expiry, the distance between

the two lines will narrow and the shape will also become closer to the expiry pay-off line, till eventually (on the last day) the two curves merge.

**Figure 12.2:** Net gain on SBI call option before July expiry (equivalent to option's market value, assuming a liquid near-efficient market, minus option premium paid)



- Notes:**
1. Exact curve depends on interest rate, time to expiry, market volatility and whether option is American or European.
  2. The dashed line represents intrinsic value of the option minus call premium.

As the Table 12.1 and Figures 12.1 and 12.2 show, this strategy limits the potential loss to ₹ 100, while leaving unlimited potential for gain. Readers may note that because the option underlying is identical to the spot market equivalent which is the purpose of the transaction, there is no need to adjust for any 'beta' factor. On the other hand if the Nifty index were being used as a substitute for SBI shares, the size of the options transaction would have to be weighted by the beta factor.

In the above case, Mohan had no short position in SBI shares and was speculating – he wanted to profit from a rise in SBI share prices rather than protect himself from a fall. If, on the other hand, he had started out with a short position in SBI shares and then purchased the call option, it would be a hedging transaction. In that case, the pay-off diagram for the combined position (i.e., a short position in the underlying plus a long call) would be the same as for simply having a put option on the underlying. If a put option is purchased, then at expiry, there would be a profit if the price of the underlying is below the strike price and a loss equal to the premium if the underlying is at or above the strike price. In other words, the gains and losses from holding a short position

in the underlying along with a long call option are the same as just holding a naked put option on the same underlying. Therefore, this combination of positions (short position in the underlying with the purchase of a call option) is sometimes, rather confusingly, called a ‘*synthetic put*’.

### Hedging strategy – protective put buying or long put

#### Example 12.2

*Abdul already has a substantial holding in SBI shares and desires to hedge against a fall in prices between May and July. The price, as in the previous example, is ₹ 1,900 in May with a July put (at-the-money) priced at say ₹ 100.*

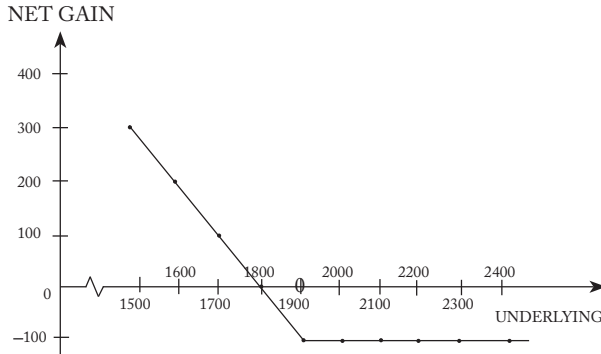
*Abdul now hedges by buying a put option (hence the term ‘long put’) at the money. If SBI’s stock price rises, he gains in the spot market but does not lose in the options market – he can simply let the option expire unexercised. If the price falls, he loses in the spot market but the value of the option rises. The position is summarised in Table 12.2:*

**Table 12.2:** Pay off table: Protective long put

(All figures in rupees)

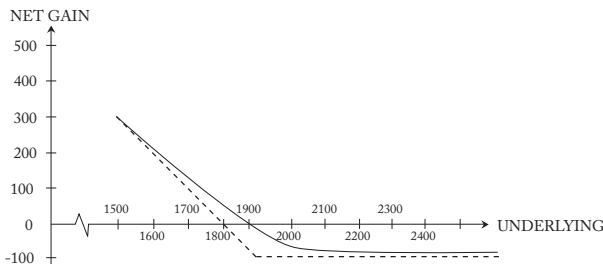
SBI share price at the time of options expiry	Spot market gain/(loss)	Options position			Combined spot plus options position
		Premium	Gain on option	Gain/(Loss)	
[1]	[2]	[3]	[4]	[5] =[4+3]	[6]=[2+5]
1500	(400)	(100)	400	300	(100)
1600	(300)	(100)	300	200	(100)
1700	(200)	(100)	200	100	(100)
1800	(100)	(100)	100	0	(100)
1900	0	(100)	0	(100)	(100)
2000	100	(100)	0	(100)	0
2100	200	(100)	0	(100)	100
2200	300	(100)	0	(100)	200
2300	400	(100)	0	(100)	300

**Figure 12.3:** Gain on SBI put option at or after July expiry  
(corresponding to column 5 in Table 12.2)



The pay-off diagram in Figure 12.3, as in Table 12.2, represents the pay-offs at the expiry date in July. If the position is closed earlier than July, the pay-offs would be different. In this case, the option would be closed by selling it rather than by exercise or by expiry unexercised. When it is sold, the selling price will always be positive (since every unexpired option has some time value even if it has no intrinsic value.) Since the selling price will be greater than zero, the net premium incurred (purchase price minus selling price) will be less than the premium paid initially. The pay-off for a closure of the position before expiry is depicted in Figure 12.4. As with Figure 12.2, here again the pre-expiry pay-off line is a smoothed version of the expiry pay-off line. As the position approaches expiry, the distance between the two lines will narrow and the shape will also become closer to the expiry pay-off line, till eventually (on the last day) the two curves merge.

**Figure 12.4:** Net gain on SBI put option before July expiry



- Notes:**
1. Exact curve depends on interest rate, time to expiry, market volatility and whether option is American or European.
  2. The dashed line represents intrinsic value of the option minus put premium.

The strategy limits the potential loss to ₹ 100, even while maintaining the upside potential. But this hedge may not be worthwhile if only a marginal decline in price is anticipated. In such a situation, it may be better to absorb the smaller price decline, rather than to hedge at a greater cost (i.e., premium).

The pay-off diagram for the *combined position* (i.e., a long position in the underlying plus a long put) is the same as for *simply buying a (naked) call option* on the same stock: if a call option is purchased, then at expiry, there would be a profit if the price of the underlying is above the strike price and a loss equal to the premium if the underlying is at or below the strike price. Therefore, this combination of positions is sometimes, rather confusingly, called a '*synthetic call*'.

### Other strategies<sup>3</sup>

#### Covered calls or buy-write strategies

Investors and traders often use limit orders to sell equities (with limit price above market price). A limit order is one where the broker is instructed to buy or sell a security or commodity if, and only if, a particular price is reached. Options can offer an alternative to limit orders where the investor can not only retain the discipline of a limit order but even get paid for it by receiving options premium or the variance risk premium. Of course, there may (depending on the specific circumstances) be some transaction costs and /or margin requirements *vis-à-vis* limit orders.

#### *Example 12.3: Selling covered calls*

*In the earlier example a holder of SBI stocks decided to hedge by buying a put which involved payment of a premium. Raman, another holder of SBI shares, feels the price is unlikely to fall much and would like to earn some premium income. He writes a call option (hence a 'short call') at-the-money, thereby earning a premium of ₹ 100. If the price remains at or below the present level, the option will not be exercised, and the premium will be a clear profit. The outcome at various prices is as in Table 12.3 below:*

3 These have not been classified as 'speculative' or 'hedging' because some of them could, in some cases, be used for either purpose depending on specific circumstances.

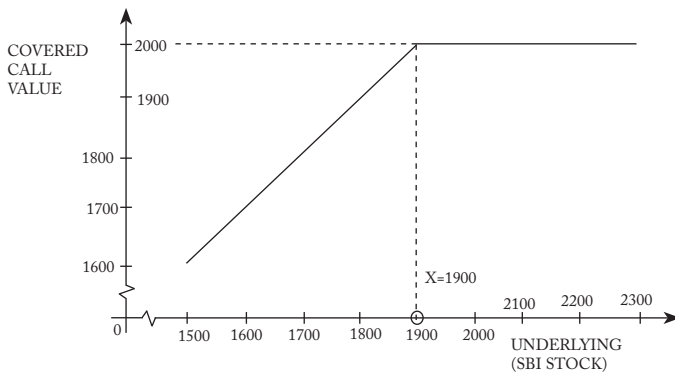
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**Table 12.3:** *Selling covered calls*  
(All figures in rupees)

Price of SBI shares	Options position			Combined spot plus options position
	Premium	Market gain / (loss)	Net position	
1500	100	0	100	1600
1600	100	0	100	1700
1700	100	0	100	1800
1800	100	0	100	1900
1900	100	0	100	2000
2000	100	(100)	0	2000
2100	100	(200)	(100)	2000
2200	100	(300)	(200)	2000
2300	100	(400)	(300)	2000

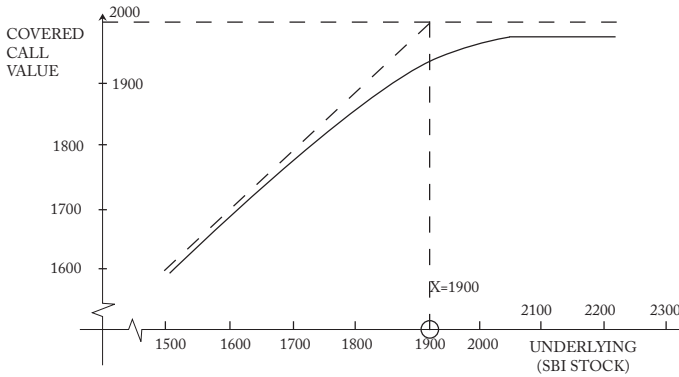
The pay-off diagram for the combined position alone is shown below:

**Figure 12.5:** Pay off for a 'covered call' at expiry (long underlying plus short call option) based on the last column in Table 12.3



The pay-off for a closure of the position before expiry is depicted by the curved line in Figure 12.6.

**Figure 12.6:** Pay off for a 'covered call' before expiry



**Note:** Exact curve depends on interest rate, time to expiry, market volatility and whether option is American or European.

Selling covered calls is a limited gain and unlimited<sup>4</sup> potential loss strategy, involving an un-hedged adverse price risk. But this downside risk is present even if one merely holds the stock. Therefore, taking the holding of the relevant stock as a given, the real trade-off is the earning of a premium (₹ 100 in this case) compared to letting go of any upside during the maturity of the option.

Another use of a covered call, as referred in the introduction above, is to effectively set an exit price for a holding of the underlying. Instead of selling an ATM call, Raman could have sold an out-of-the-money call with an exercise price of ₹ 2,000 per share. He would have earned a smaller premium. If the price rose by less than ₹ 100 during the period remaining till maturity, the call would expire without being exercised. If the price rose above ₹ 2,000, the option would be exercised and Raman would have to sell his holding at ₹ 2,000.

When used in this manner, selling a covered call (which forces the holder of the stock to sell the stock if it rises by a specified amount within a specified period) is equivalent to, but not the same as, a limit order to sell at ₹ 2,000. If Raman wanted to give a limit order to sell his shares at ₹ 2,000 per share, then the above options strategy may (depending on transaction costs) be a superior way of doing it. If the price rose as expected, Raman would achieve the expected sale price. If the price fell, he would be slightly better off than by simply giving

4 More precisely, the risk is limited by the fact that the stock price cannot fall below zero. Thus, in Example 12.3, the loss is limited to ₹ 1,800; of course this is 18 times the option premium of ₹ 100 .



a limit order, because he would have earned a premium. However, there may be some transaction costs.

### Selling puts while keeping requisite cash (cash-secured put)

#### Example 12.4

Bhagat is interested in buying SBI shares. SBI is currently trading at ₹ 1,900. He thinks buying SBI at a net cost of ₹ 1,750 or below is worth it, but above that it is too expensive. He sells a July SBI 1,800 put for ₹ 50. In this way, if SBI trades at above ₹ 1,800 later, he will retain ₹ 50. If the put trades below 1,800, the purchaser of the put option will exercise the option and Bhagat will have to buy it. He was ready to buy SBI at ₹ 1,750 in any case; the cost to him if the price falls below ₹ 1,800 is effectively ₹ 1,750 (strike price of ₹ 1,800 minus put premium received of ₹ 50). Hence he has nothing to lose from this outcome. However, Bhagat has to retain enough cash to buy the shares in case the option is exercised, and the interest on the margin locked up represents a cost. The payoff is shown in Table 12.4.

**Table 12.4:** Cash-covered short put  
(All figures in rupees)

SBI share price in July	Put option premium received	Gain (loss) on put option	Balance from cash cover of ₹ 1800 i.e., strike price	Value of stock bought	Overall portfolio
	(1)	(2)	(3)	(4)	(1+2+3+4)
1500	50	-300	300	1500	1550
1600	50	-200	200	1600	1650
1700	50	-100	100	1700	1750
1800	50	0	0	1800	1850
1900	50	0	1800	0	1850
2000	50	0	1800	0	1850
2100	50	0	1800	0	1850

In essence, if an investor wants to buy shares in case they fall to a particular level, he or she can sell a put option at the desired level. Similarly, if an investor wants to short-sell a stock in case it rises to a particular level, he can sell a call option at that level. If an investor already has a short position in a stock, he can sell a put option; any losses on selling the option will be compensated by the gain on the short position.

In short, options can be used to hedge existing holdings or expected purchases. They can also be used to earn income while continuing to hold the underlying shares, or (if one is prepared to purchase the stock) even without holding the stock. To summarise:

- One can buy a put along with an existing holding, or purchase, of the underlying. This is called a *protective put buying*. This is appropriate when one is bullish but wants to protect against unexpected downward price movements.
- One can sell a call option while holding the underlying – this is called a *covered call selling*. If the option is exercised, the holder already has the shares to deliver – hence the term ‘covered’.
- *Selling puts and keeping requisite cash* can be used to earn income if the price rises, or to buy the underlying security if the price falls (while pocketing a premium)

### Portfolio hedging through options

Portfolio managers who are net long on equities can partially or fully hedge themselves by selling stock index futures. However, while this avoids future losses, it also implies giving up any future gains. As an alternative, they can hedge by buying stock index put options and/or entering into ‘spreads’. Consider a fund manager who runs a well-diversified portfolio which mirrors the stock market and therefore has a beta of close to one. The fund manager can buy downside ‘insurance’ by buying an appropriate number of stock index put options without sacrificing any upside. That is, the portfolio has not been immunised or ‘frozen’, but it has been insured.

However, hedging through a futures contract incurs no expense (except margin collateral deposit and transaction costs), but buying options involves paying a premium which will never be returned – just like an insurance policy. If the risk materialises, the returns could be many times the original premium but otherwise the premium may be a ‘waste’ – the answer will only be known *ex post facto*. More advanced strategies often involve spreads (i.e., multiple option positions or ‘legs’) to minimise premium outflow (or to increase net inflow) and the overall risk, given a certain market outlook. Examples of such strategies are presented and examined in the next chapter.