# 3 Options

Forwards and futures can be used to hedge against adverse movements in asset prices. This is the major advantage of these financial instruments. However, these derivatives do not give chance to get the benefits that may accrue due to favourable movements in asset prices. The reason for this is that the firm is under obligation to buy or sell assets at predetermined rates. This limitation of forwards and futures has led to the emergence of options.

**Meaning of Options**

The word option simply refers to choice or freedom. This choice or freedom may or may not be used depending upon the situation. Option means right without obligation. An option is a contract that gives the holder (owner) the right, but not the obligation, to buy or sell an underlying asset at a specified price on or within a specified date in future.

Thus, option is a special type of contract which gives its holder the right, but not the obligation, to buy or sell an asset at a fixed price at some future date. For example, one person buys an option contract to purchase 100 shares of SBI at ₹ 250 per share within a period of 3 months. It means that the said person has the right to purchase the shares of SBT at ₹ 250 per share within 3 months from the date of the contract. If the share price increases, he will exercise the option. This is because he can buy shares at ₹ 250 even though the price is increased. If the share price falls below ₹ 250, then he will not exercise the option (he has no obligation to buy). This is because he has to pay ₹ 250 for one share even though the market price is fallen. Thus, it is clear that an option is the right but not the obligation to buy or sell something at specified date at a stated price. It means that the option buyer will exercise the option when he is in profit. In case of loss, he will not exercise the option.

**Features of Options**

The important features of options are as follows :

1. It is a contractual agreement that gives the buyer the right, but not the obligation, to buy or sell a specified asset at a specified price on or within a specified period.

2. There are two parties to an option contract. One is buyer (investor or owner) who buys the right. Second is writer (seller) who sells the right (to buy or sell) to the buyer.
3. The seller of option sells the right to choose to the buyer in return for a payment called premium. Hence option is somewhat similar to insurance.
4. The buyer of option may exercise his right or may not exercise his right. He will exercise his right only when it is beneficial for him by doing so. If it is beneficial, he shall not exercise the option. He shall let the option expired. Then he will lose the premium paid. It becomes a gain to the seller.
5. The seller has no choice. He has no right. He has only obligation. This means that he must meet his obligation when the buyer exercises his right.
6. There are two types of option– call option and put option.
7. The buyer of option should exercise his right at any time during the period of contract, i.e., at any time between the signing of the contract and the expiry date (American style). This intervening period is called expiration period. If the buyer does not exercise the option within the specified period, the option gets expired.
8. The specified or agreed price at which the owner is allowed to buy/sell the specified asset is called exercise or strike price. It is the price at which the option (right) is exercised. It is based on the current quoted prices.

**Parties to Option Contracts**

1. **Purchaser (Investor):** He is the person who buys the option. He is the owner of the option. He has the right to exercise the option. But he has no obligation to exercise the option. It means that he may exercise the option or may not exercise the option. He takes the long position.
2. **Writer (Seller):** He is the person who sells the option. When buyer exercises the right, the writer has the obligation to perform. Therefore, he has high risk. He takes the short position.

**Important Terms (Option Terminology)**

1. **Exercise price (Strike price):** The price specified in the option contract is called exercise or strike price. It is the fixed price at which the owner can buy (or sell) the asset.
2. **Spot price :** The current market price of the asset at the time of exercising the option is called spot price.
3. **Underlying :** Every option is based on the price of some assets that is not traded in the option market. This asset is called underlying asset or simply underlying.
4. **Premium :** The purchaser or owner of the option has the right to exercise the option or not. If it is beneficial, he will exercise the option. If it is not beneficial, he will not exercise the option. He has no obligation to exercise the option. The seller has no such

right. He must meet his obligation. Thus, the buyer of an option gets greater benefit. Hence, the seller would enter into an option contract, only if the buyer compensates the seller for the potential loss that the seller would incur. The seller is taking the risk of price change. Hence, the seller demands that the buyer should pay an amount at the time the option contract is entered into. This amount that the option buyer needs to pay to the option writer (seller) is known as option premium. Thus, premium is the amount which the seller charges the buyer in the form of a return for guaranteeing the exercise of option. If the buyer does not exercise the option, he will lose the premium paid. The premium is to be paid initially, i.e., at the time of signing the contract. The option premium is the option price.

5. **Exercise date:** The date on which the option is actually exercised by the buyer is known as exercise date.
6. **Expiration date:** The date on which the option expires is known as expiration date. In other words, it is the last day by which the option has to be exercised. In short, it is the final settlement day. It is also known as expiration date or maturity. On expiration date, either the option is exercised or it expires worthless.

For example, on 23rd November 2019, Roopa enters into call option contract with Reeja for buying 1,000 shares of Infosis after one month at ₹ 800 per share by paying a premium of ₹ 15 per share to Reeja.

In the above example, Roopa is the option buyer (owner or investor), Reeja is the option seller (writer), 1,000 shares of Infosis become the underlying asset, ₹ 800 is the strike price, the period of contract one month is the expiration period, and the last Thursday of December 2019 is the expiration date.

**Option from the Point of View of Seller/Writer**

For the writer/seller profit is limited to the premium. However, he has to bear unlimited loss. Practically, he is in a disadvantageous position. If his calculation or anticipation is correct, he can come out of the disadvantageous position. The seller has no choice. He must meet his obligation to buy/sell, when the buyer exercises his option.

**Need for Options (Advantages of Options)**

The need for option arises from many advantages it offers. Options yield capital gain. Option holders can enjoy a tax advantage. They can control their rights on the underlying asset. Further, options create the possibility of giving a windfall profit. Similarly, options can reduce the total portfolio transaction costs. Again, options enable with their investors to gain a better returns with a limited amount of investment. They can be used for hedging the risk also. One can combine options and other derivatives in a process known as financial engineering to control the risk in a given transaction. It can be used for protecting stock portfolio. It can also be used for generating additional income on stock holdings. The need for option arises from the following advantages :

1. With less capital, one can trade a large position. That is, it is a geared investment.
2. The buyer can limit the loss, while he can maximize the profit.
3. Options can be used to hedge against a fall in price of an asset.
4. Options can be used for hedging as well as for speculation.
5. Options can be used as a tool of efficient portfolio management.

**Difference between Futures and Options**

Options and futures are derivatives. They differ in certain respects. The following are the important points of differences between futures and options:

| *Futures* | *Options* |
|---|---|
| 1. Both the parties are obliged to perform the contract (buy or sell the underlying asset). | 1. Only the seller (writer) is obliged to perform the contract. |
| 2. Margin is the basis of the contract. | 2. Option premium is the basis of the contract. |
| 3. Both buyers and sellers face the possibility of unlimited gain or loss. | 3. Buyers have the possibility of unlimited profit but their losses are limited. Sellers have the possibility of limited profit. But their losses are unlimited. |
| 4. These are preferential contracts for the speculators to maximise profit. | 4. These are preferential contracts for the hedgers to minimise risk. |
| 5. It has to be honoured by both the parties only on the specified date. | 5. It can be exercised by the buyer at any time during the life of the contract or option period. |

**Difference between Forwards and Options**

| *Forwards* | *Options* |
|---|---|
| 1. Both buyer and seller have obligations. | 1. Only the seller has an obligation (buyer had option but not an obligation). |
| 2. Customised contract. | 2. Standardised contract. |
| 3. Not traded in stock exchanges. | 3. Traded in stock exchanges. |
| 4. There is no premium and margin. | 4. The buyer pays premium to the seller, while the seller deposits margin initially with subsequent deposits made depending on the market. |
| 5. Expiry date depends upon the transactions. | 5. American options can be exercised at any time during the life of the contract. |

**Classification of Options (Types of Option Contracts)**

A. **Classification on the basis of right** : On the basis of right, options may be classified into call options and put options.

**1. Call Option**

It is an option that gives a purchaser the right (but not the obligation) to buy the underlying asset from the writer at the specified exercise price on a specified date. In short, the option to buy the underlying asset is a call option. It is useful in a rising market, i.e., when the prices are rising. If the spot rate of the asset rises above the exercise price, owners (purchasers) of call options shall exercise their option by purchasing the asset at the strike price (strike price will be cheaper than the spot rate). This strategy is somewhat similar to that used by purchasers of futures, but futures requires an obligation which the option does not.

In short, under favourable circumstances, the buyer may choose to exercise the option. Under unfavourable circumstances (when the spot rate falls below the exercise price), the buyer shall not exercise the option. He can choose to let the option expire without exercising it. If the option expires without being exercised, the buyer receives no compensation for the premium paid, i.e., he loses the premium initially paid. This is the maximum amount that he loses. Thus the position of an option buyer is similar to that of a buyer of insurance (general) while the position of an option writer is similar to that of a seller of insurance.

**Example of a Call Option**

Suppose price of share today is ₹ 100. An investor expects a price rise, say ₹ 140 after one month. Instead of buying share, an investor buys a call option, which has a price, say ₹ 8 (i.e., option premium).

In this case, instead of investing ₹ 100, the investor invests only ₹ 8 (premium) by buying the right to buy the share.

Suppose the price increases to ₹ 140 after one month. Now the spot price is ₹ 140 and the exercise price is ₹ 100. Thus the spot price is greater than the strike price (favourable movement because he needs to give only the exercise price, i.e., ₹ 100). He has locked in the price ₹ 100. But, the spot price (market price) is ₹ 140. Hence he will exercise his option. Then investor's profit will be ₹ 32 (i.e., 140 – 100 – 8 = 32). His cost comes to ₹ 108 (including the premium) and the market price is ₹ 140. Hence his profit comes to ₹ 32. The percentage of profit will be 32/8 x 100 = 400%). His investment is only ₹ 8 (premium), but he makes a profit of ₹ 32. So the percentage of profit on investment is 400%. If the exercise price is higher than the market price, he would not exercise his option. He will lose the premium. His loss will be ₹ 8 (i.e., loss is limited to premium). Seller's gain will be ₹ 8.

If the investor buys the share (instead of entering into an option contact), his profit will be ₹ 40 (market price ₹ 140 less cost price ₹ 100). His investment is ₹ 100. So the percentage of profit on investment is only 40%, i.e., 40/100.

If the spot or market price is less than the exercise price (say ₹ 80), the buyer would not exercise his right. This is because the buyer can buy the share on the open market for less price (₹ 80) than the exercise price (₹ 100). He will lose the premium ₹ 8 (loss). This means the

seller gets the premium ₹ 8 (i.e., his profit). Thus, the buyer has to bear only limited loss (loss is limited to the premium paid if the right is not exercised). However, he can gain more, if the option is exercised (i.e., limited loss but unlimited profit).

**2. Put Option**

It is an option that gives a purchaser the right (but not the obligation) to sell the underlying asset to the writer at a specified price (strike price) on a specified date. In short, it is the option to sell the underlying asset. The buyer of put option will exercise his right to sell the asset if and only if the spot price (price of the underlying asset in the market) is less than the strike price on or before the expiry date of the contract. This is because the buyer can buy the underlying asset at spot price (which is less) and immediately sell it at strike price (which is higher ) by exercising the put option (no actual buying and selling, instead, price difference is settled) if the price of the underlying asset (spot price) is higher than the strike price, he will never exercise the option. Then his loss is limited to the option premium paid (i.e., the loss is limited).

**Example of a Put Option**

Suppose share price today is ₹ 200. An investor who expects a fall in price in future, buys put option (i.e., buying a right to sell shares at ₹ 200 within a period, say, 3 months) for a premium, say, ₹ 20. Suppose after two months, price has fallen to ₹ 140.

In the above example, the buyer will exercise his option, i.e., sell the share at ₹ 200. The exercise price was ₹ 200. The market price (spot price) is ₹ 140. Hence his profit will be ₹ 40 (i.e., 200 – 140 – 20). Here the actual transaction (i.e., buying the share at ₹ 140 and selling the same at ₹ 200) does not take place. It is closed with the difference. This is the feature of derivatives. The investor's percentage of profit would be 200% (i.e., 40/20 x 100).

Suppose the spot price is ₹ 240 (instead of ₹ 140), he shall not exercise his option. It is so because, if he exercises his option (i.e., selling the shares at ₹ 200, for which the spot price is ₹ 240) he shall incur a loss of ₹ 60, i.e., (240 – 200) + 20. If he does not exercise his option, he would not get back the premium paid. Even though the spot or market price is ₹ 240, he can sell only at exercise price ₹ 200. In this way his total loss will be ₹ 60. Hence in this situation, he will not exercise the option. If he does not exercise the option, he will lose only ₹ 20 (premium). Otherwise he would lose ₹ 60.

Conceptually, the call option and put option are shown below :

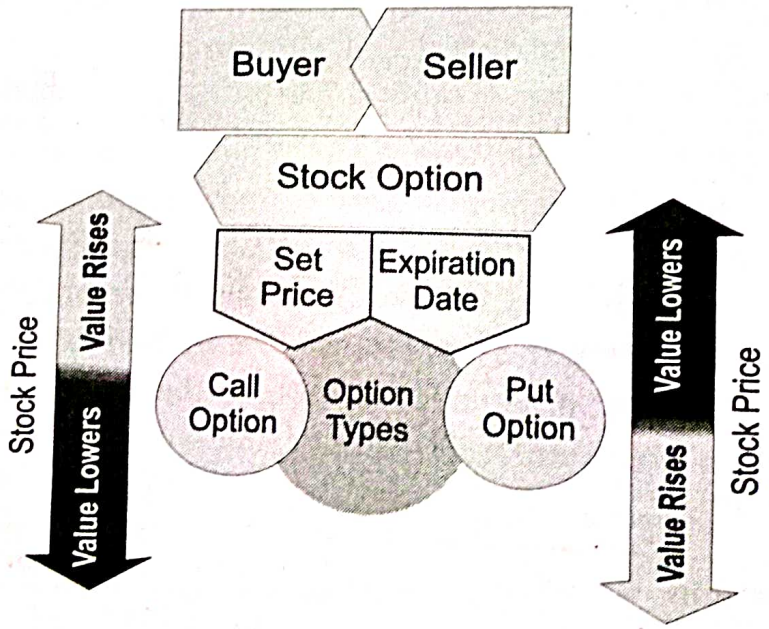
| Type | Buyer of the right | Seller of the right |
|---|---|---|
| Call | Right to buy at the specified price | Obligation to sell at the specified price |
| Put | Right to sell at the specified price | Obligation to buy at the specified price |

**B. Classification on the basis of style of exercise :** Depending on when an option can be exercised, options are classified into the following three categories :

1. **European Option:** European options are options that can be exercised, only on the expiry date (maturity). In India, European options are not used.
2. **American Option:** American options are options that can be exercised, at any time during the option period (i.e., any time between purchase date and the expiration date). In other words, American options can be exercised on any day on or before the expiry date. Thus, American option involves extra flexibility. Hence, it involves higher premium.
3. **Bermudan Option:** A Bermudan option can be exercised on a few specific dates prior to expiration. The name 'Bermuda' was chosen perhaps because Bermuda is half way between America and Europe.

**C. Classification on the basis of nature of underlying assets :** Based on the underlying, options may be of the following kinds :

1. **Commodity option :** Here the underlying is commodities. Commodity options enable the farmers to trade on price movements of general commodities. The price movement of commodities will reflect the worth of commodity option. In India, as of now, commodity options are not available.
2. **Currency option :** It is a contract that confers the right to buy or sell foreign currency at a specified price at some future date. It acts as a vehicle to protect against adverse exchange rate fluctuations.
3. **Stock option :** Here the underlying asset is individual stocks of corporates. The stock option requires the actual delivery of stock upon exercise.




*Stock Option Process* (Fig. 1)

4. **Stock index option :** Stock index option enables investors to trade in general stock market movements. The stock price movement will reflect in stock index option prices. In stock index option, the transactions are settled by payment of cash. The amount of cash

settlement is equal to the difference between the closing price of the index option price and the stock price of the option.

D. **Classification on the basis of place of trading or trading practice :** On the basis of place of trading or trading practice, option can be classified into the following two:

1. **Exchange traded options :** These contracts are standardised and are traded on organised exchanges. These specify in uniform underlying asset, limited number of strike prices and limited number of expiration dates as determined by the exchange. These are very similar to futures.
2. **Over the counter options :** These are custom tailored agreements sold directly by dealers rather than through an exchange. The terms of these contracts are negotiated by the parties of the contract. These are like forward contracts.

E. **Other types of options :** There are some other types of options. They are:

1. **Real option:** It is a choice that an investor has when investing in the real economy (i.e., in the production of goods or services, rather than in financial contracts).
2. **Vanilla and exotic option:** A vanilla option is a 'simple' or well understood option. But exotic options are more complex or less understood. European options and American options on stock and bonds are generally considered to be 'plain vanilla'. Asian options, look back options, barrier options (hybrid options) are exotic.
3. **Warrants:** These are long dated options. These are generally traded over the counter.
4. **LEAPS:** LEAPS means Long term Equity Anticipation Securities. These are options having a maturity of upto three years.
5. **Baskets:** These are options on portfolios of underlying assets. The underlying asset is usually a moving average of a basket of assets. Equity index options are a form of basket options.

**Moneyness of the Option**

Moneyness refers to the potential profit or loss from the exercise of an option. At any time before the expiration, an option may be in-the-money, at-the-money or out-of-the- money.

1. **In-The-Money (ITM) option :** A call option has value only if the spot or cash price (market price of the underlying asset) exceeds its strike price. Then the option buyer will exercise the option and make profit. Such a call option is said to be in-the-money. Thus, in-the-money option is an option that would lead to a positive cash flow to the holder (buyer) if it were exercised immediately. In short, a call option is in-the-money, if the spot price (S) is greater than the strike price (K) (i.e., if $S > K$). A put option is in-the-money if the spot price is less than the strike price.

2. **Out-of-The-Money (OTM) option :** As already stated, options will not be exercised if they have no value. Such options are said to be 'out-of-the money options. An out-of-the- money option is an option that would lead to a negative cash flow if it were exercised immediately. Thus, a call option is out-of-the-money if the spot price (market price) is less than the strike

price of the underlying asset. A put option is out-of-the-money when the strike price is less than the spot price (or spot price is greater than spot price) of the underlying asset.

3. **At-The-Money (ATM) option :** If the spot price and the strike price are the same, the option, whether call or put, is at-the-money option. Thus, an at-the-money option is an option that would lead to zero cashflow, if it were exercised immediately. In short, an option (whether call or put) is said to be at-the-money, when strike price is equal to the spot price of the asset.

The above may be summarised as below :

| Market Scenario | Call option | Put option |
|---|---|---|
| Market Price > Strike price | In the money | Out of the money |
| Market Price < Strike price | Out of the money | In the money |
| Market price = Strike price | At the money | At the money |


*Moneyness in Options* (Fig. 2 )

**Example 1**

The stock price of Akash Ltd. in spot market is ₹ 450 and two-month option contract is of ₹ 450. The price of the option is ₹ 20 per share. At what price the option will be at-the-money, out-of-money and in-the-money if the option is both call as well as put option ?

**Solution**

Option strike price : ₹ 450 per share

Premium (price) : ₹ 20 per share

**Call Option**

(i) At-the-money : 450 + 20 = ₹ 470 per share

(ii) In-the-money : Price greater than ₹ 470 per share

(iii) Out-of-money : Price less than ₹ 470 per share

**Put option**

(i) At-the-money : 450 - 20 = ₹ 430 per share

(ii) In-the-money : Price less than ₹ 430 per share

(iii) Out-of-money : Price above ₹ 430 per share

### Positions in the Options Contract

There are four types of option positions. They are briefly explained as below :

1. **Long position in a call option** : A person who buys a call option is said to have a long position in a call option. He purchases the right, but not the obligation, to buy underlying asset at the stated exercise price at any time before the option expires. In short, long means buy.
2. **Long position in a put option** : A person who buys put option is said to have a long position in a put option. He buys the right, but not the obligation, to sell the underlying asset at the stated exercise price at any time before the option expires.
3. **Short position in a call option** : A person who sells a call option is said to have a short position in a call option. He can short sell the underlying asset (selling without owning the asset) or sell a call option. He sells the right to buy the asset. He has the obligation to sell the underlying asset at the stated exercise price when the buyer exercises his option before the option expires. In brief, short means sell.
4. **Short position in a put option** : A person who sells a put option is said to have a short position in a put option. He sells the right to sell the asset at a fixed (exercise or strike) price. He has the obligation to buy the underlying asset at the stated exercise price.

The four types of option positions are shown below :

| Option | Buyer | Seller |
|---|---|---|
| Call | Right to buy | Obligation to sell |
| Put | Right to sell | Obligation to buy |

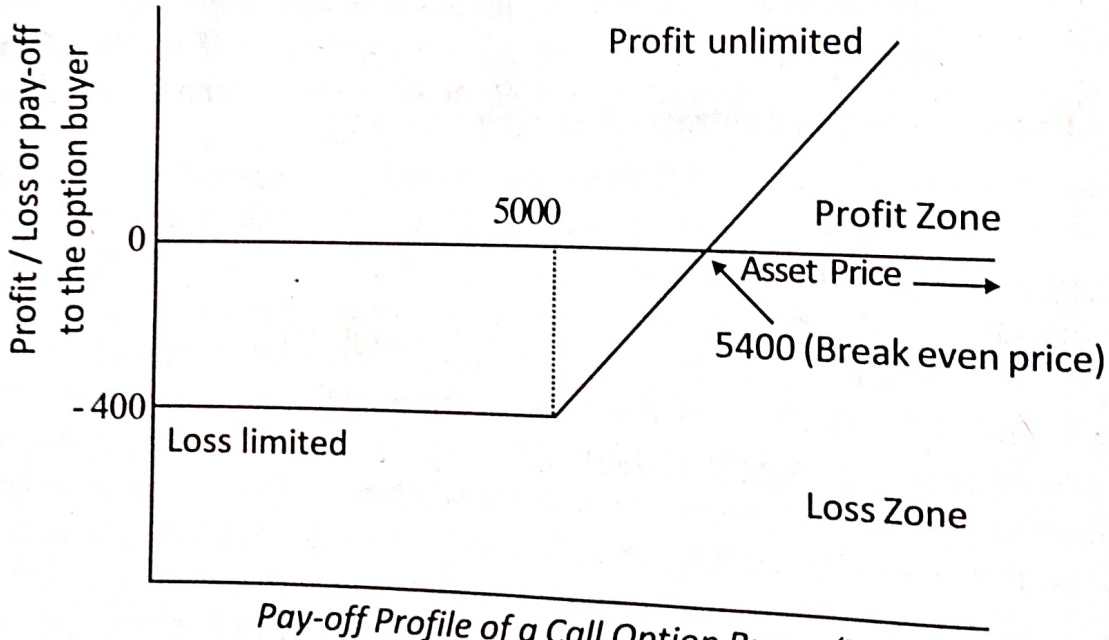
### Risk and Return Profile of Option Contracts (Pay-off in Options)

As stated earlier, option buyer has a right but not obligation in a contract. He will exercise this right only when he is likely to be benefited by doing so. For example, if he holds a call option on a particular stock he will exercise his option only when the market price of that stock is higher than the strike price so that he gets profits from the difference between the market price and the strike price. The difference between the market price and strike price is known as pay-off. A pay-off is the likely profit or loss that would accrue to a market participant with change in the price of the underlying asset. It is the profits as well as losses for the buyer and seller of futures or option contracts. The profit potential of option buyer is unlimited as there is no cap on the market or spot price. If, however, the market price is lower than the strike price, option buyer will let his option expire without exercising it. In this case, he will lose a limited amount of the option premium. Thus, the profit potential (pay-off) is unlimited and the loss is limited. The maximum loss is the premium paid to the option writer (seller). Conversely, as the profit or loss of an option buyer reflects the loss/ profit of an option seller, the seller carries an unlimited risk with a limited return potential. His maximum gain is the premium received from option buyer. Thus the risk and return profile (pay-off profile) of an option contract is asymmetric unlike that of futures contract. The concept is better understood with the help of an example.

Assume that Mr. X gives Mr. Y a right / option to buy (call option) one share or stock at ₹ 5,000 (strike price) for settlement after one month. The right / option can be exercised any time during the life of the contract. Hence the option is an American option. The current market price of stocks is also ₹ 5,000 (cash price). Assume that Mr. X has charged Mr. Y ₹ 400 (option premium) as the price for purchasing this option / right.

Mr. Y will not exercise his option as long as the cash or spot price of the stock at time t (i.e., St) is less than ₹ 5,000. This is because by doing so he will incur the loss equivalent to ₹ 5000 - St. He may decide to exercise his option any time during the life of the contract if market price of the stock is above ₹ 5,000. However, if the market price of the stock is between ₹ 5,000 and ₹ 5,400 when he decides to exercise his option, he will incur a loss equivalent to the difference between ₹ 5,400 (strike price + option premium) and the prevailing market price of the stock. For instance, if market price of the stock at that time is ₹ 5,300, his loss will be ₹ 100 (5,300 - 5,000 - 400) because his total outflow is ₹ 5,400 and inflow from the sale of the share is ₹ 5,300. He will break even at the stock market price of ₹ 5,400. Break even price is the price where the gain is just equal to the option premium (break even price = stock price + option price). If the market price is above ₹ 5,400 at the time of exercise of the option, he will make a profit. For instance, if the market price at that time is ₹ 5,450, Mr. Y will make a profit of ₹ 50 (5,450 - 5,000 - 400).

The pay-off profiles of the buyer and seller of such a call option are shown in Figures 5 and 6 respectively.



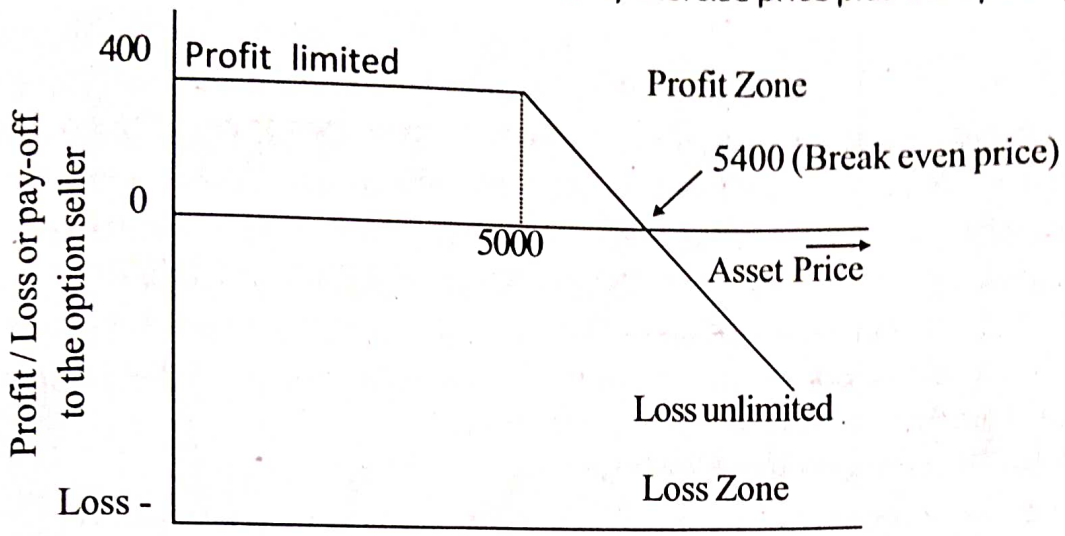

*Pay-off Profile of a Call Option Buyer* (Fig. 5)

*Potential Profit* : Unlimited as the underlying stock price increases.

*Potential Loss* : Limited to premium paid for call option.

Thus we can say that a call option holder (buyer) will make a profit from an option only if the price of the underlying asset rises above the exercise / strike price plus the option premium at the maturity of the contract or time of exercise of the option. As the pay-off profile for a call

option seller is the mirror image of that of a call option buyer, he will make profit only if stock price is less than the strike price plus the option premium. In other words, he will lose money if the price of the underlying asset rises above the strike/exercise price plus the option premium.



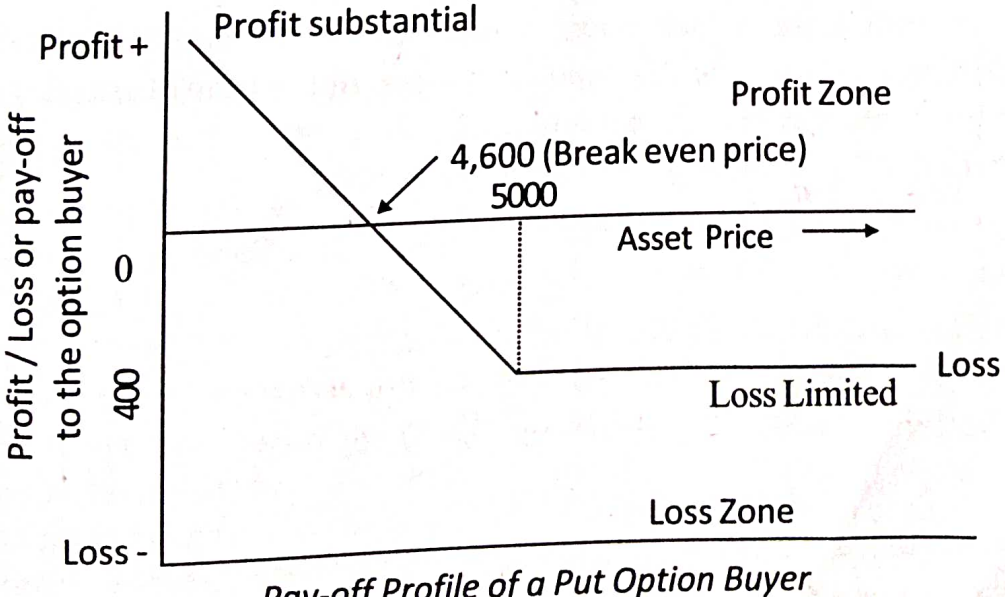

*Pay-off Profile of a Call Option Seller*

Fig. 6

*Potential Profit* : Limited to premium received from call's initial sale.

*Potential Loss* : Unlimited as the underlying asset price increases.

Similarly in case of a put option (option to sell) if Mr. A buys a put option on the same stock with a strike price of ₹ 5,000 at a premium of ₹ 400 he will make profit only if the price of the stock goes below ₹ 4,600 (strike price - option premium) at the maturity or time of exercise of the option. On the other hand, a put option seller will lose money if the stock price is below ₹ 4,600. The pay-off profiles for a put option buyer and seller are shown in Figures 3 and 4 respectively.

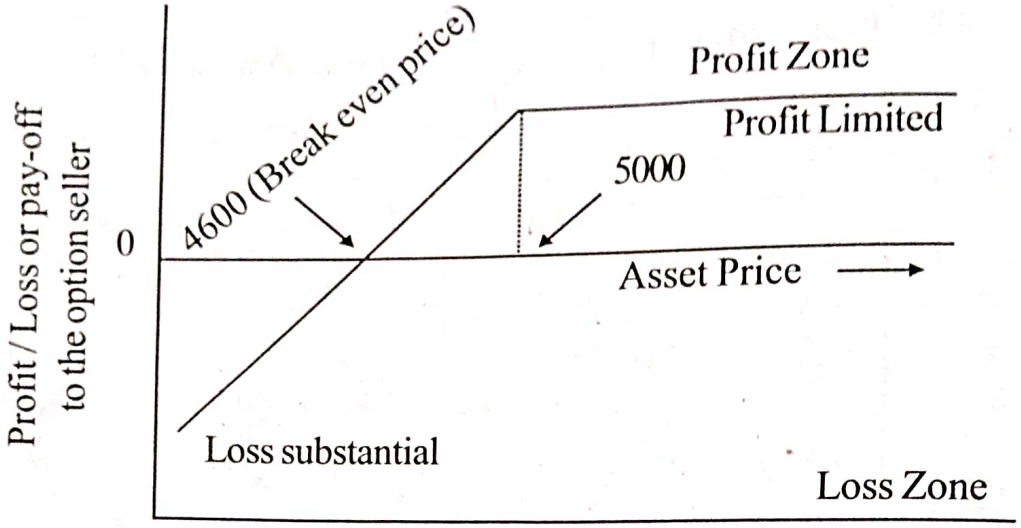



*Pay-off Profile of a Put Option Buyer*

Fig. 7

*Potential profit* : Substantial and increases as the underlying stock price decreases.

*Potential Loss* : Limited to premium paid for put




*Pay- off Profile of a Put Option Seller*

Fig. 8

*Potential Profit* : Limited to premium received

*Potential Loss* : Substantial and increases as the underlying stock price decreases.

**Note :** The pay off diagrams shown in Fig. 5 and Fig. 6 are mirror images of each other. The reason is that profit or loss of the call option buyer is equal to the loss or profit of the call option seller. This is true in the case of put option also. This means that option trading is a zero-sum game.

**Margining in Options**

In case of call option, the holder (buyer) has to deliver cash equal to exercise price. In case of put option, he has to deliver the underlying asset. At the time of entering into option contract, the option buyer has to pay the premium. On the contrary, the option seller assumes unlimited risk in case price of the asset moves unfavourably.

As in the case of futures contract, the performance of option contracts is also assured by the options exchanges. In other words, the options exchange has the responsibility for settlement. Hence it faces risk from the option seller. When the buyer enjoys the right of his performance on the exchange, the exchange has, in turn, to make sure that the contract will be honoured. For example, A writes a naked call, his broker would need a guarantee in some form that he would have the necessary funds to be able to deliver the asset, when the buyer of the option chooses to exercise the option and also assure the exchange of the performance of the contract. For this, margin requirements exist as a form of guarantee to ensure that the writer of a naked call option can fulfil the terms of the contract. Accordingly, the option sellers are required to meet the margin requirements. The requirements vary depending upon the

brokerage firm, price of the underlying asset, the price of the option and whether the option is a call or a put. As a general rule, initial margins are at least 30% of the stock price when the option is written, plus the intrinsic value of the option.

The credit risk of the exchange can be eliminated if positions of the seller are marked to market (MTM) and losses collected, as is done in case of futures. In case of futures MTM losses collected are passed as MTM profits. This too could be followed in case of options where MTM losses collected from sellers / losers are passed on to option buyers / gainers. If such a practice is adopted, the position of option buyers too would need to be marked to market and they too would be subject to margin call. Such a practice is called futures style options, where both buyers and sellers are marked to market.

**Break Even Positions of Option Parties**

A break even position of option party is that level of market price of the underlying asset, at which the party (buyer / seller) has no-profit no-loss position.

**Fundamental Option Strategies**

We have understood the basics of options. Now let us understand the fundamental and simple option strategies. The following are the elementary strategies:

1. Long call
2. Short call
3. Long put
4. Short put

The above are the basic elementary (or fundamental) strategies. These are known as the building blocks of option strategies. These are the four major arms of an option contract. These may be briefly discussed as follows:

**1. Long Call (Buy Call)**

A long call is simply the purchase of one call option. A call option buyer has the right to buy the stock (underlying) at the strike price until the expiration date. An investor will buy a call option with the expectation of a price rise (so, it is a bullish strategy). He believes that a stock's price will increase. Hence he buys the right to purchase the stock (a call option) rather than just buying the stock. He has no obligation to buy the stock. He has only the right to do so until the expiry date. If the stock price increases over the strike or exercise price by more than the premium paid he will make profit. If the stock price decreases, he will let the contract expire worthless, and lose only the amount of the premium paid. A trader may buy the option instead of shares (to buy shares, more investment is needed ). This is because for the same amount of money he can obtain a larger number of options than shares. If the stock price rises, he will thus get a larger gain than if he had purchased shares.

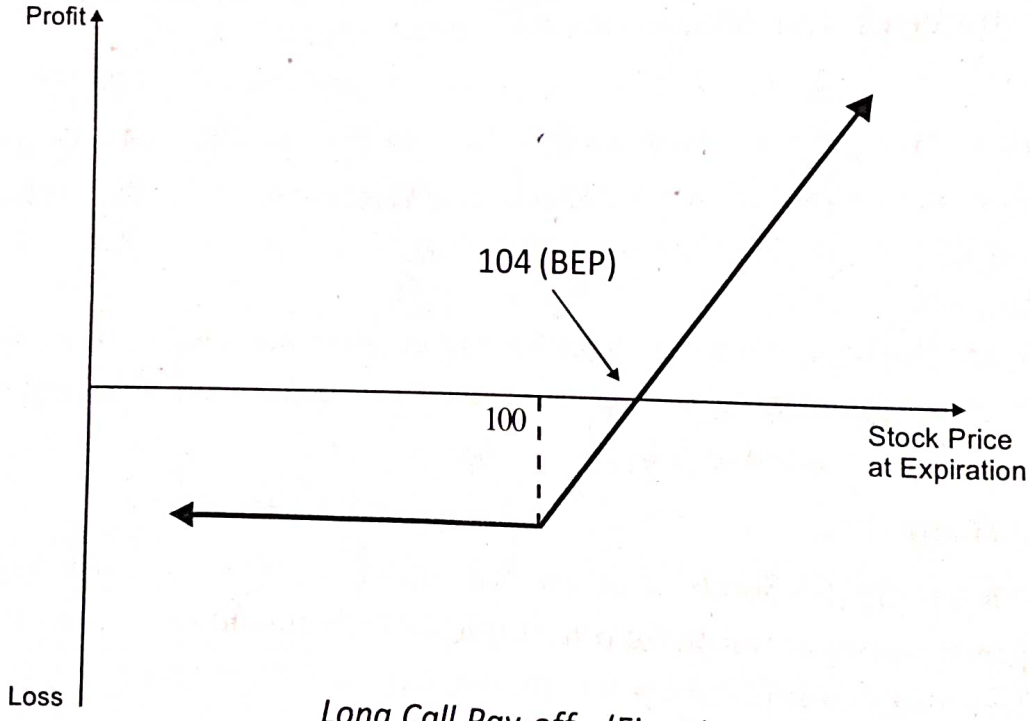
***Example***

Long call may be understood from an example. Suppose on the expectation that the market price will increase within one month, Mr.A buys a call option to buy stock for the strike price of ₹ 100. He pays premium ₹4. Suppose within one month the market price of the stock increases to ₹ 107. Then A will get a profit of ₹ 3. Since the market price increases, he will exercise the option by buying the stock. He has to pay only the strike price ₹ 100. He need not pay the market price ₹ 107. Hence his profit is ₹ 3 (107 - 100 - 4). When the market price increases more, he will get more profit. Thus his profit is unlimited. His profit becomes the loss of call option seller. Suppose the market price of the stock falls to ₹ 91. Then A will not exercise the option. Who will buy the stock by paying the strike price ₹ 100 when the market price is ₹ 91. He will let the contract expire. Then he loses the premium paid ₹ 4. Thus his loss is limited to the premium paid (even when the price falls more).

Break even point for long call position may be calculated by the following formula:

BEP = Strike price of long call + Premium paid

The profit or loss diagram of a long call option is given below :




*Long Call Pay-off* (Fig. 9)

**When to use the Long Call Strategy**

Long call strategy is used when the trader expects that the market price will rise significantly. This means that the investor is bullish on market direction and also bullish on market volatility (unlimited profit but limited loss).

**2. Short Call (Sell Call)**

A short call is simply the sale of one call option. Selling an option is also known as "writing" an option. Thus, short call means selling or writing a call option. A trader who

believes that a stock price will decrease can short sell the stock or instead sell call. Both strategies are generally considered inappropriate for small investors. The trader selling a call has an obligation to sell the stock to the call buyer at the buyer's option. If the stock price decreases, the short call position will make a profit. If the stock price (underlying price) rises, the short call position will incur a loss. The loss is unlimited as the market price rises. In the meantime, the gain is limited to the premium received for selling the option. Thus the short call is a very risky position. This is because the risk is unlimited.

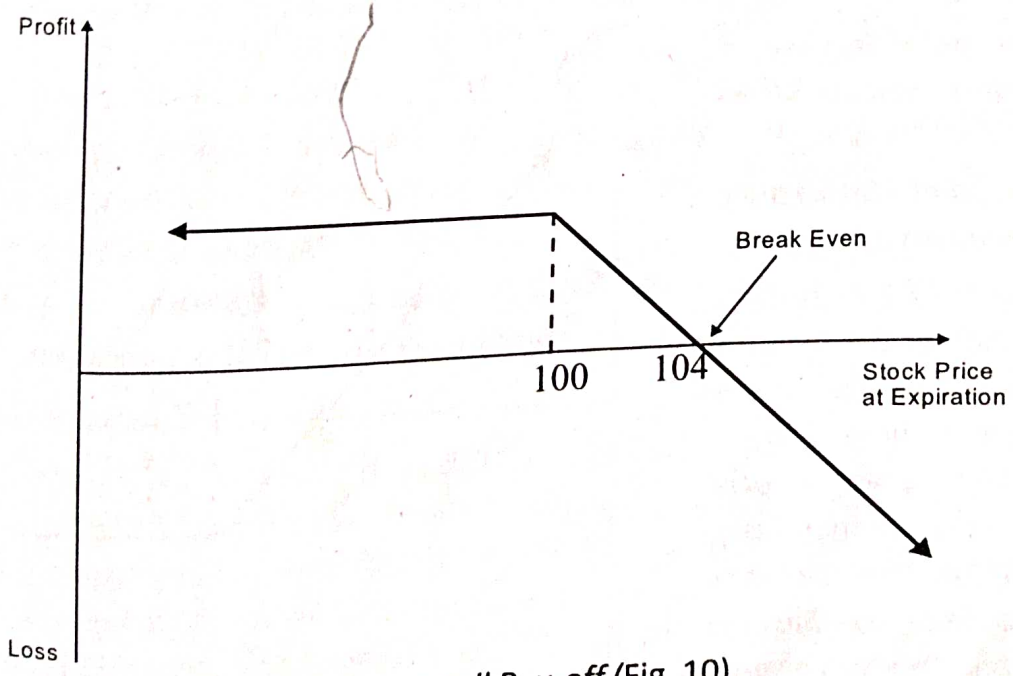
***Example***

Suppose on the expectation that the market price of the stock will decrease within one month, Mr. A sells a call option for a strike price of ₹ 100 and receives premium ₹ 4. Suppose within one month, the market price of the stock decreases to ₹ 90. Then A will get a profit. His profit is ₹ 4 (limited to premium received). This is because when the market price decreases the call option buyer will not exercise his option and the option expire worthless. Who will buy the stock by paying the strike price ₹ 100 when the market price is ₹ 90 only. His loss is limited to ₹ 4, the premium paid. The buyer's loss becomes the seller's profit. If the market price increases to ₹ 106, the call option buyer will exercise the option. He will buy the asset by paying the strike price ₹ 100 which is lower than the market price ₹ 106. This means that the call option seller has to sell the stock to buyer for ₹ 100 (the market price is ₹106). A's loss is ₹ 2 and not ₹ 6 because he received premium ₹ 4 (106 - 100 - 4 = 2).

In the case of short call, the BEP is calculated as below :

BEP = Strike price + Premium

The profit or loss diagram of a short call option is given below :




*Short Call Pay-off* (Fig. 10)

**When to use the Short Call Strategy**

This fundamental strategy is adopted, when an investor is bearish on market direction and also bearish on market volatility. This is because a call option seller expects a fall in market price (bearish). When the market price falls, he will get profit (limited to premium). When the market price decreases more, he will not get additional benefit. This is because his profit is limited to the premium received. On the other hand, when the market price increases more, his loss will increase. Hence, he expects a lower (bearish) volatility.

**3. Long Put (Buy Put)**

A long put is simply the purchase of one put option. A trader who believes that a stock's price will decrease can buy the right to sell the stock at a fixed price (strike price). He will be under no obligation to sell the stock. But he has the right to do so until the expiry date. If the stock price decreases below the exercise price by more than the premium paid, he will get profit (strike price- underlying price- premium paid).

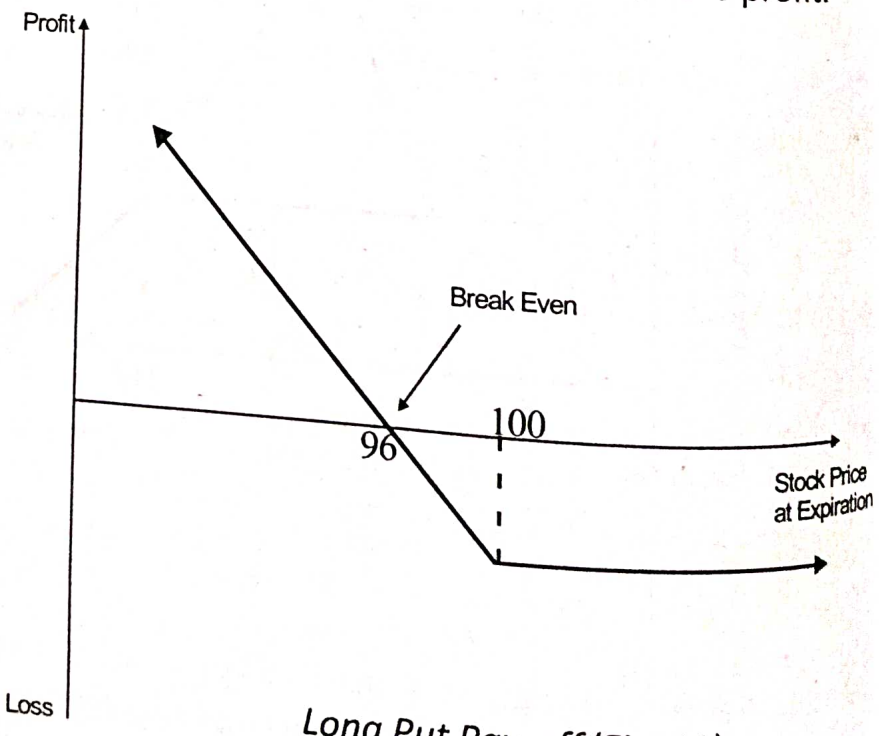
***Example***

Suppose on the expectation that the stock price will decrease within one month, Mr. A buys a put option for a strike price of ₹ 100, market price of the stock, decreases to ₹ 94 and the premium paid is ₹ 4. Then the profit of the put option buyer is ₹ 2 (100 - 94 - 4). He can sell the underlying asset at the strike price of ₹ 100 for which the underlying price is ₹ 94 only. Thus he gets a profit of ₹ 6 from which the premium paid ₹ 4 should be deducted. Suppose the stock price (underlying or market price) decreases to ₹ 96 (break even) there is no profit, no loss. If the underlying price increases to ₹ 102, he will not exercise his option to sell the contract (just let the put contract expire worthless). Then his loss is limited to the premium paid. The buyer's profit becomes the seller's loss and the buyer's loss becomes the seller's profit.

Breakeven point in case of long put option is calculated as below :

Breakeven point = Strike price of long put - Premium paid

Thus, the profit potential (upside potential) for the buyer is unlimited (as the market price decreases), while the downside risk (loss) is limited to the premium paid (when the market price increases, the buyer will let the contract expire). The profit or loss diagram of a long put option is given below :




*Long Put Pay-off* (Fig. 11)

**When to use the Long Put Strategy**

This fundamental strategy is adopted when an investor is bearish on market direction and bullish on market volatility. This is because a put option buyer or holder expects the market price of the underlying to decline (to make profit) and anticipates that volatility would increase (to make unlimited profit when the market price decreases more). When the market price increases more, it does not matter because loss is limited to the premium paid.

**4. Short Put (Sell Put)**

A short put is simply the sale of a put option. It means selling the right to sell. The seller of a put option has an obligation to buy the underlying asset at the strike or exercise price (if the option is exercised). He has to buy the asset because he has sold the right to sell the asset. A trader who believes that a stock's price (market price of the underlying) will increase can sell the right to sell the stock (underlying ) at a fixed price. If the stock price (market price) increases, the short put position will make a profit equal to the premium received. If the stock price decreases below the exercise price by more than the premium, the short position will lose money.

*Example*

Suppose on the expectation that the market price of stock will increase within one month, Mr. A sells a put option for the strike price of ₹ 100 receives (because he is the seller) a premium from the buyer ₹ 4. Suppose within one month the market price of the stock increases to ₹ 107. Now A's profit is ₹ 4 (premium received). When the market price increases, the option buyer or holder will not exercise the option (let it expire). This is because he will get only the strike price ₹ 100 (the market price is ₹ 107). His loss is limited to the premium paid, ₹ 4. If the market price of the stock decreases to ₹ 93, A (option seller) will lose money ₹ 3 (100 - 93 - 4). This is because the put option buyer or holder will exercise the option (sell the stock) get ₹ 100. The market price is only ₹ 93. Hence, his profit is ₹ 3.

Thus the loss of the put writer (seller) is unlimited as the market price falls, while his gain is limited to the premium received for selling the put option (when the market price increases the put holder will not exercise the option ).

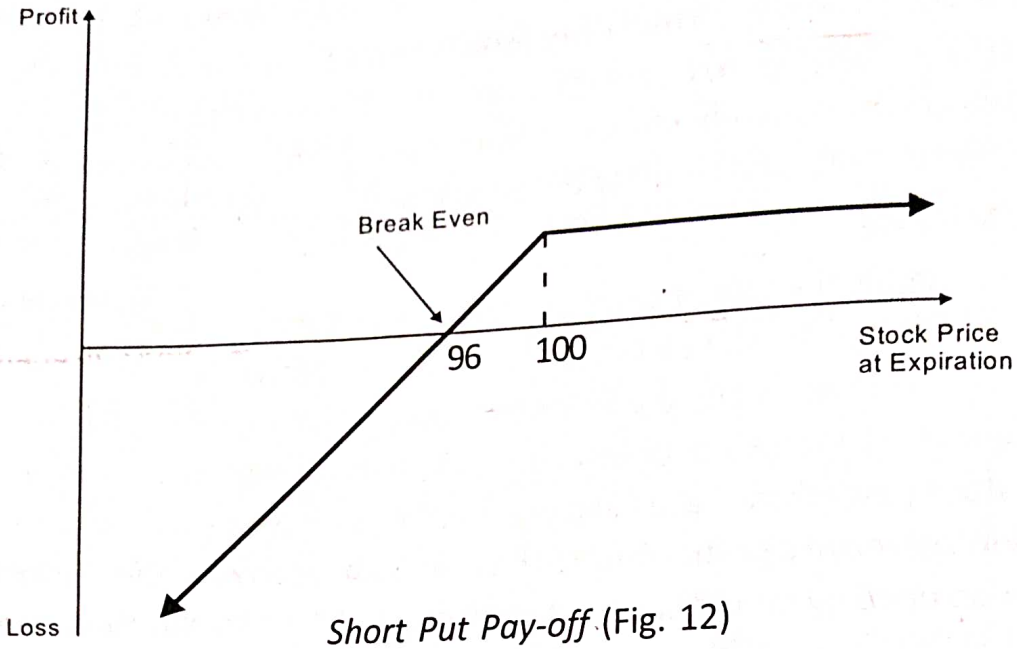
In the case of short put, BEP is calculated as below :

BEP = Strike price of short put- Premium

**When to use the Short Put Strategy**

This fundamental strategy is used when an investor is bullish on market direction and bearish on market volatility. This is because a put option seller expects the market price of the underlying to increase (to make profit). When the market price increases more, there is no additional benefit because his profit is limited to the premium received. On the other hand, when the market price decreases more, his loss will increase. So he expects a lower (bearish) volatility.

The profit or loss diagram of a short put option is given below :




*Short Put Pay-off* (Fig. 12)

**Trading Strategies Involving Stock Options (Uses of Options)**

Options open up a lot of possibilities. This means that different strategies can be formulated by using options. Each of these strategies has a different risk/reward (pay-off) profiles. Some are comparatively high-risk, like purchasing call and put options. Others are meant to earn profit if specific expectations are met. Options can be used for speculation also. Thus, option strategy means use of different combinations of options in order to hedge against volatility of market and also to make profit.

Choosing the right option strategy is one of the most difficult decisions for an investor. Some believe covered calls (call options where the call writer owns the asset) as the best strategy because it reduces risk and in the meantime allows for a profit. Some others suggest straddles because one can make money whether the market is going up or down. But the unfortunate truth is that no single strategy works in all types of market.

All trading strategies involving options may be broadly classified into the following four:

(i) **Hedging** involves an attempt to control or manage risk by combining the purchase or sale of an option with some position in the asset.

(ii) **Speculation** involves the purchase or sale of an option without any position in the underlying asset.

(iii) **Spreading** is a case when hedging is done within the option market, i.e., by simultaneous purchase and sale of option of same type.

(iv) **Combinations** of call options and put options in various ways can also be used to design option strategies. Different types of options strategies can be framed with different perceptions on risk reward combinations.

Alternatively, the option strategies can be classified into bullish strategies, bearish strategies and neutral strategies.

**Option Trading Strategies**

| Bullish Strategies | Bearish Strategies | Natural Strategy |
|---|---|---|
| 1. Long Call | 1. Short Call | 1. Long Straddle |
| 2. Short Put | 2. Long Put | 2. Short Straddle |
| 3. Call Bull Spread | 3. Call Bear Spread | 3. Long Strangle |
| 4. Put Bull Spread | 4. Put Bear Spread | 4. Short Strangle |
| 5. Call Back Spread | 5. Put Back Spread | 5. Butterfly Spread : |
| 6. Covered Call | | Long Call Butterfly |
| 7. Protective Put | | Short Call Butterfly |
| | | Long Put Butterfly |
| | | Short Put Butterfly |
| | | 6. Time (Calender) Spread : |
| | | Call Time Spread |
| | | Put Time Spread |
| | | 7. Condor : |
| | | Long Condor |
| | | Short Condor |

**Hedging with Options**

The unique feature of hedging with options is that when combined with position in the asset it protects the losses from the adverse movement while retaining the potential gain from the farourable movement of price. The returns from the favourable side are reduced only marginally by the amount of the premium paid.

We consider hedging with options for long and short positions in an asset, which need protection against fall and rise in the prices respectively.

1. **Hedging Long Position in Stock - the Protective Put**

The protective put strategy involves buying shares (stock) and buying a put option for the same shares (i.e., a long position in both the stock and the put option). In this strategy, the buying of put option protects the trader against the fall in the stock price of that shares. So the loss of the trader is limited to the premium paid but the profit potential is unlimited.

In protective put, if the asset price increases, the trader will not exercise the option. His loss will be limited to premium paid. In case the asset price falls he can exercise the put option and sells the asset at a price equal to the strike price. So a protective put brings limited loss but unlimited profit.

***Example***

Suppose, an investor buys a share for ₹ 100. To hedge against the risk of loss from a fall in its price, he buys a put option for ₹ 8 (i.e., he pays the premium) for an exercise price of ₹ 100 (ATM). He will exercise the option only if the price of the share falls below the exercise price. If the price falls to ₹ 90, the investor will exercise the option, i.e., he will sell the stock for ₹ 100 (the market price of the stock is ₹ 90). His profit is ₹ 2 (100 - 90 - 8). In case of rise in price, he will not exercise the option. Then his loss will be limited to the premium paid. Suppose the stock price increases to ₹ 120. Definitely, he will not exercise the option. If he exercises the option his loss would be ₹ 28 (20 + 8). Since he has stock with him, he can sell his stock to somebody for ₹ 120. Then his profit will be ₹ 12 (120 - 100 - 8). Thus, in the event of price rise, the long put protects him from loss. That is why, it is called a protective put. Protective put is also known *as synthetic long call*. It is called so because its risk / reward profile is the same as that of a long call.

**Protective Put Construction**

Long 100 Shares

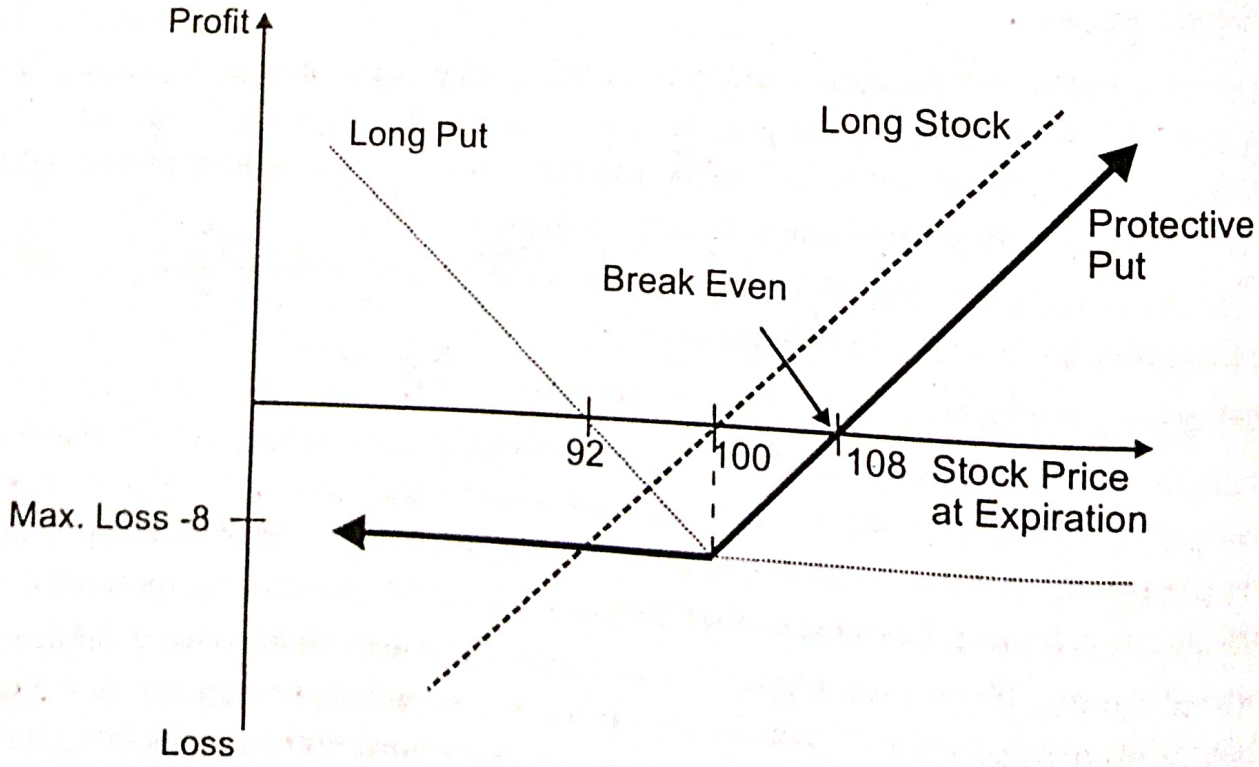
Buy 1 ATM Put

**BEP**

In the case of protective put, the BEP is calculated as below :

BEP = Purchase price of underlying + Premium paid

The profit or loss diagram of a Protective Put Option is given below :




*Protective Put Pay-off* (Fig. 13)

**When to use the Protective Put Strategy**

A protective put strategy is usually employed when the options trader is still bullish on a stock he already owns, but he is not sure about the direction of the price movement. It is used as a means to protect unrealised gains on shares from a previous purchase.

**2. Hedging Short Position in Stock with Call Option**

Now consider an opposite position with no asset in possession. Many of us would wonder what protection one needs on an asset that is not owned yet. Of course, one has nothing to lose because he does not own. Yet protection is needed if he is intending to own the asset in near future. Possibly one does not have funds to acquire the asset now. Such a position is considered as short position on asset. For short position, the price fall is favourable. But price rise is unfavourable. If price rises, then owning (buying) the asset will become expensive. It is here the protection is needed. Alternatively, where short selling is allowed, an investor may short sell the asset expecting a fall in price, and buy back later. The investor carries a risk if price rises subsequently. To minimise the risk involved, the investor can buy a call option. In the event of rise in price, the investor can exercise the call owned and compensate for the losses incurred on the short position in stock. It may be noted that the loss in case of rise in price is limited to a maximum of premium paid for the call option (long call). In case of fall in price, the profit from the stock is reduced by the amount of premium paid on the call

**3. Income Generation through the Strategy of Writing Covered Call**

Both the strategies discussed above aim at limiting the risk of an underlying position in an equity stock option. Both of them may also be used for generating returns from the positions in stock. To earn the premium an investor may choose to write a call option expecting that the price will not exceed the exercise price. If the expectations come true, it would not be exercised by the call option buyer or holder. Thus, the seller can pocket the premium.

***Example***

Suppose an investor writes a call for ₹ 5 premium for a strike price of ₹ 100. The stock price falls to ₹ 95. In this case the option holder would not exercise the option. This is because he has to buy the stock by paying ₹ 100 for which the market price is ₹ 95. Thus the premium received by the writer is his profit. However, in case his price exceeds the exercise price, the option holder (he has the right to buy the stock but he has no obligation to buy) will exercise the call. Thus the writer (seller) will have to deliver the underlying asset at the current market price. Such a strategy is called naked call writing, i.e., writing a call on the asset not owned. Naked call writing is deemed to be extremely speculative strategy in nature. This is because for a very small profit, i.e., the call premium, a call writer assumes significantly unlimited risk of incurring unlimited losses. In contrast to naked call writing, the strategy of covered call writing on the asset already possessed can be used. In case the writer of the call already owns the underlying asset on which the call is written, the delivery can be made without going to

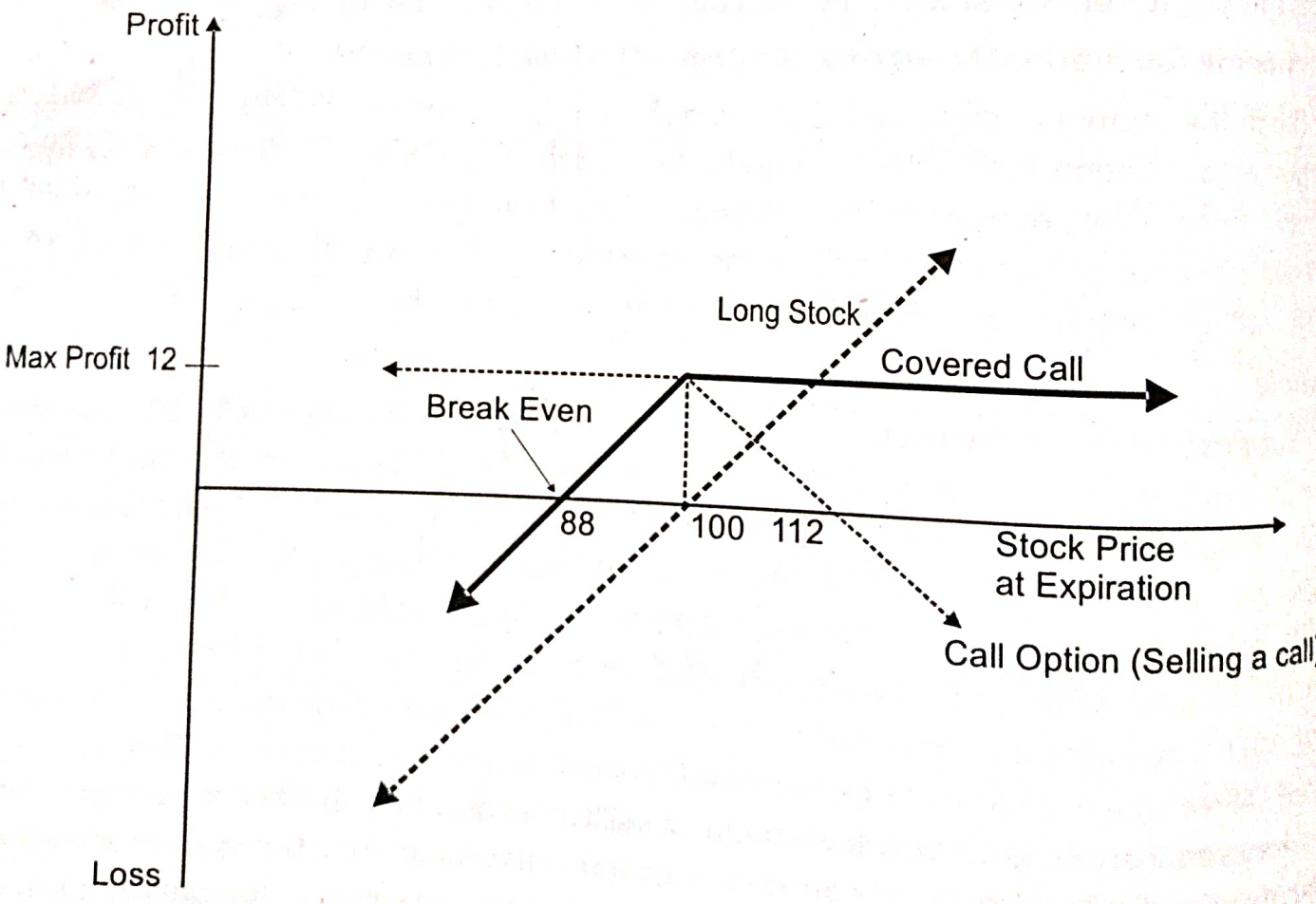
the market (i.e., he need not buy the asset from the market to deliver it). This strategy can be effectively used to increase income when markets are dormant. If not much gain is foreseen on the asset owned in such market conditions the owner of the asset may choose to write a call to earn premium and enhance return. In case of rise in price in market when there are volatility, the call writer can fall back on the asset already owned for delivery. Let us take an example. Suppose an investor owning stock writes a call at ₹ 100 with the premium of ₹ 12. If the price increases beyond ₹ 100, the holder would exercise the call and the writer would meet his obligation without going to the market. This means that he need not buy the stock at increased price because he has already owned the stock. If the price remains below ₹ 100, the holder would not exercise the call. The writer will get ₹ 12 (premium) and continues to keep the asset (stock). This has become possible through writing a covered call. Writing a call can also be deemed as hedge against falling prices. In short, covered call means writing a call when the writer holds or owns the security (i.e., the writer has already held the security).

**Covered Call (OTM) Construction**

Long 100 Shares

Sell 1 Call

The profit or loss diagram of a covered call option is given below :




*Covered Call Pay-off* (Fig. 14)

If a call is written, where the writer does not have the asset underlying the call option, the call said is to be a *naked call* or *uncovered call.* In short, uncovered call means writing a call without holding the security (i.e., the writer does not own the security). When the call owner decides to exercise the option, the seller of the call has to buy the underlying asset at its prevailing market price and give it to the call owner.

**4. Income Generation through the Strategy of Writing Put**

The strategy of writing a covered call is used when no upside movement in price is forecast. Similarly, when one is short on stock (not owning the stock) and no downside movement is foreseen, an investor can decide to write a put option to increase returns in the short run. Writing a put option, while short on the underlying , is similar to writing a covered call. Unlike covered call, there is no such term called covered put. If an investor writes a put he must buy the stock when required by the put holder at exercise price. This is because the investor has sold the right to sell the asset to the holder. The holder has the right to sell (but not obligation). When the holder exercises his right, the writer must buy it. The writer of the put gets the stock at exercise price. This can be used to fulfil the position of short stock (sell the stock without owning it). In short, covered call is a less risky strategy.

**5. Speculations with Single Option**

This is another trading strategy involving option. Speculative strategy with options are rather simple. When one is bullish (expecting a price rise) he will buy a call option. This call option provides a gain if the market price exceeds the strike price. Similarly, under bearish conditions (expecting a price fall), the investor will buy put option. This will provide a gain if spot price (market price) is less than strike price of put. He can sell at strike price which is higher than the market price. Hence he gets speculative profits. Depending upon the view of the investor about the future price movement the speculative position of buying a call or put can be taken. In short, options can be used for speculative purposes.

**Other Option Trading Strategies (Combination of Options)**

Options are very versatile in nature. There are a large number of trading strategies that can be created by combination of options. These strategies are used for trading as well as for hedging purposes. If options are combined with the objective of risk containment it will be called hedging. When options are continued to take a specific view on the future price and the risk, it will become speculative. The different trading strategies by combining options may be explained as below:

**1. Straddle**

A straddle consists of buying a put option and a call option with the same exercise price and date of expiration. Straddle is an appropriate strategy for an investor who expects a large move in the price but does not know in which direction the move will be. Straddles may be long or short.

**Long Straddle :** Long straddle is formed by buying a call option and a put option on the same stock with the same strike price and expiry date. It is an excellent strategy to use when we think that the market is going to move but do not know which way.

A long straddle involves going long (i.e., buying) both a call option and a put option on the same stock. The two options are typically bought at the same strike price and expire at the same time. If the price of the stock increases the call option is exercised. If the price of the stock decreases, the put option is exercised.

**Long Straddle Construction**

Buy 1 ATM Call

Buy 1 ATM Put

**Profit or Loss**

**Maximum Loss**: Maximum loss is limited to the total premium paid for the call and put options.

**Maximum Profit**: Maximum profit is unlimited as the market moves up or down.

**Break-Even Points**

There are 2 break-even points for the long straddle position. The break-even points can be calculated using the following formulae:

- Upper Breakeven Point = Strike Price of Long Call + Net Premium Received
- Lower Breakeven Point = Strike Price of Long Put - Net Premium Received

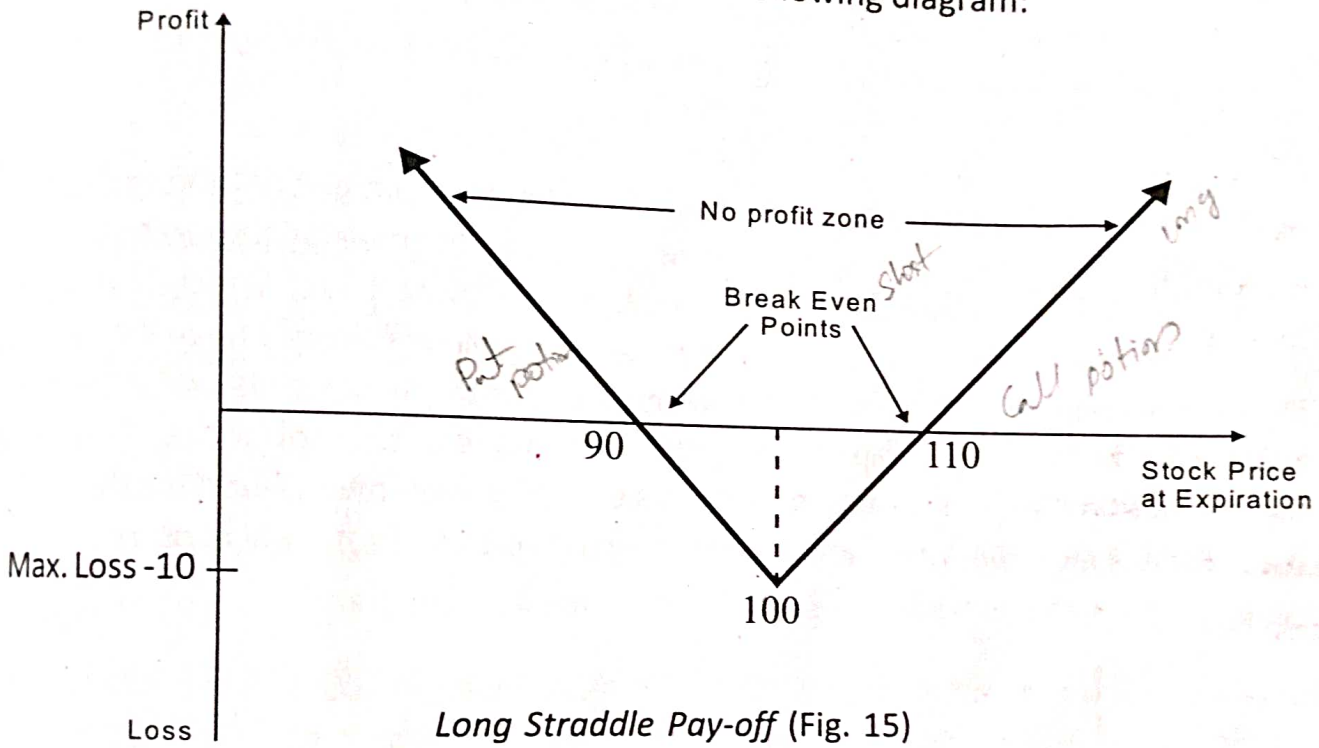
***Example***

Let us explain the long straddle with the help of an example. Assume that the cash price of a stock is ₹ 100. Mr. A is not sure about the direction the market price of stock is likely to move. But he believes that stock will move substantially in either direction. Therefore, he is interested in establishing a long straddle position. He buys one call and one put option at a strike price of ₹ 100 on payment of premium of ₹ 5 each. Then his total outflow at the time of buying straddle will be ₹ 10 (premium on both). Suppose the market price of the stock falls to ₹ 85. Then A would not exercise the call option (since strike price is higher, he would not buy). Call option would expire worthless. He loses the premium paid on call option ₹ 5. But put option will generate ₹ 15. This is because he can sell the stock at ₹ 100 (when the market price is ₹ 85). His profit will be ₹ 5 (i.e., 15 - 5 - 5) on long straddle. If the market price is ₹ 90, straddle has no profit no loss position. This is called downside BEP for straddle buyer. Any market price (price of the underlying asset) below this BEP, this position will give a profit. If the underlying price closes at cash price of ₹ 100 at maturity of the options, both options will expire worthless (would not exercise). This will result in a loss which is equal to the total premium paid. This will be his maximum loss. If the market price reaches above the strike price, the put option will expire worthless and call option will provide value depending upon cash price of the underlying. If the market price is ₹ 115, put option will expire worthless (he would not sell the

stock at the strike price of ₹ 100 when the market price is ₹ 115). But call option will generate ₹15. Then net profit is ₹ 5 (15 - 5 - 5). If the market price is ₹ 110, straddle position has no profit no loss. This is called upside BEP for the straddle buyer. If market price is anywhere above this BEP, the position will give a profit. Thus, the premium paid (₹ 10) creates a no profit zone around the strike price.

In short, in case of straddle, if market moves up, call generates money for the investor, and if market goes down, put generates value for him.

The pay-off for long straddle is shown in the following diagram:




*Long Straddle Pay-off* (Fig. 15)

**When to Use the Long Straddle Strategy**

Long straddle is a suitable strategy when we expect high volatility in the prices of the underlying asset and we do not know in which direction it is going to move.

**Short Straddle :** A short straddle is formed by selling a call option and a put option on the same asset with same strike price and same expiry date. It generates income because premiums on both the options are received (seller shall receive premium). Short straddle simply means going short (selling) both options. If the underlying price is close to the strike price at expiry, both the options will expire. Then the option writer (trader) will get the premium. However, this is a very risky strategy. If the price moves up or down sharply, then the losses will be high for the option writer.

**Short Straddle Construction**

Sell 1 ATM Call

Sell 1 ATM Put

**Profit or Loss**

**Maximum Loss**: As the market moves in either direction, the loss will be unlimited.

**Maximum Profit**: The maximum gain is limited to the net premium received for selling the options.

**Break Even Points**

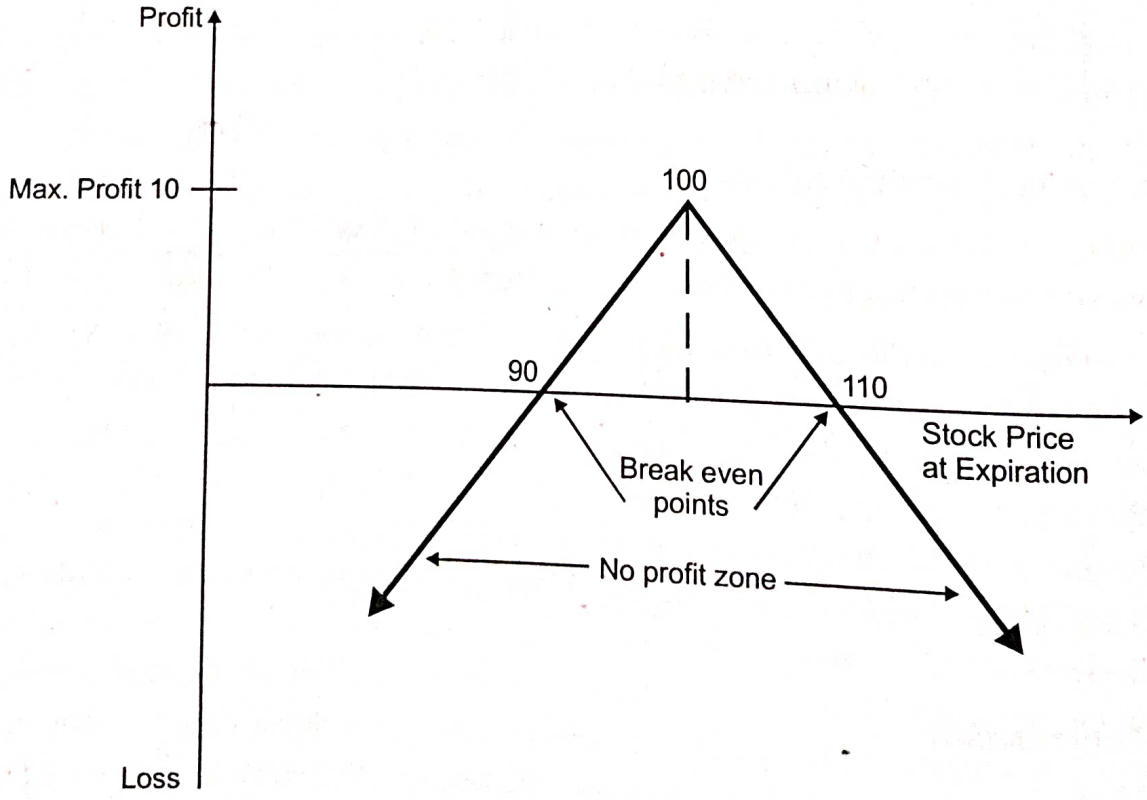
There are 2 break-even points for the short straddle position. The break even points can be calculated using the following formulae:

- Upper Breakeven Point = Strike Price of Short Call + Net Premium Received
- Lower Breakeven Point = Strike Price of Short Put - Net Premium Received

***Example***

Let us explain the short straddle with the help of an example given for long straddle. In case of straddle seller there will be a profit as long as cash price of the underlying asset (market price) at expiry of the option, is within a range of ₹ 90 and ₹ 110. In fact, ₹ 90 and ₹ 110 are BEPs for straddle seller as well. If market price goes below ₹ 90 or above ₹ 110, a short straddle position will result in a loss. The maximum profit to the straddle seller will occur if the market price of the stock happens to be the strike price of the option, i.e., ₹ 100 at the expiry of the options. This maximum profit will be total premium received for the options, i.e., ₹ 10. In such a case the buyer will not exercise the options (both will expire).

The pay-off for short straddle is shown in the following diagram :




*Short Straddle Pay-off* (Fig. 16)

### When to Use the Short Straddle Strategy

When the investor expects that the market will remain stable (less volatility), then the short straddle strategy can be used.

### 2. Strangle

A strangle is a combination of one call option and one put option with different exercise prices but with same expiration date. The strangle may be long or short.

**Long Strangle :** This is formed by buying one call option with a lower strike price and buying one put option with a higher strike price. Here, the trader combines an OTM call option with an OTM put option. If the price remains within the two strike prices, none of the options will be exercised. Then premiums paid on the options are lost. If the market price goes above the strike price of the call or goes below that of the put, a long strangle starts paying-off the cost initially (premium) and then results in the profit, if price movement is large enough.

**Long Strangle Construction**

Buy 1 OTM Call

Buy 1 OTM Put

**Profit or Loss**

**Maximum Loss:** Maximum loss is limited to total premium paid for the call and put option.

**Maximum Profit:** Maximum gain is unlimited as the market moves in either direction.

**Break Even Points**

There are 2 break-even points for the long strangle position. The breakeven points can be calculated using the following formulae:

- Upper Breakeven Point = Strike Price of Long Call + Net Premium Paid
- Lower Breakeven Point = Strike Price of Long Put - Net Premium Paid

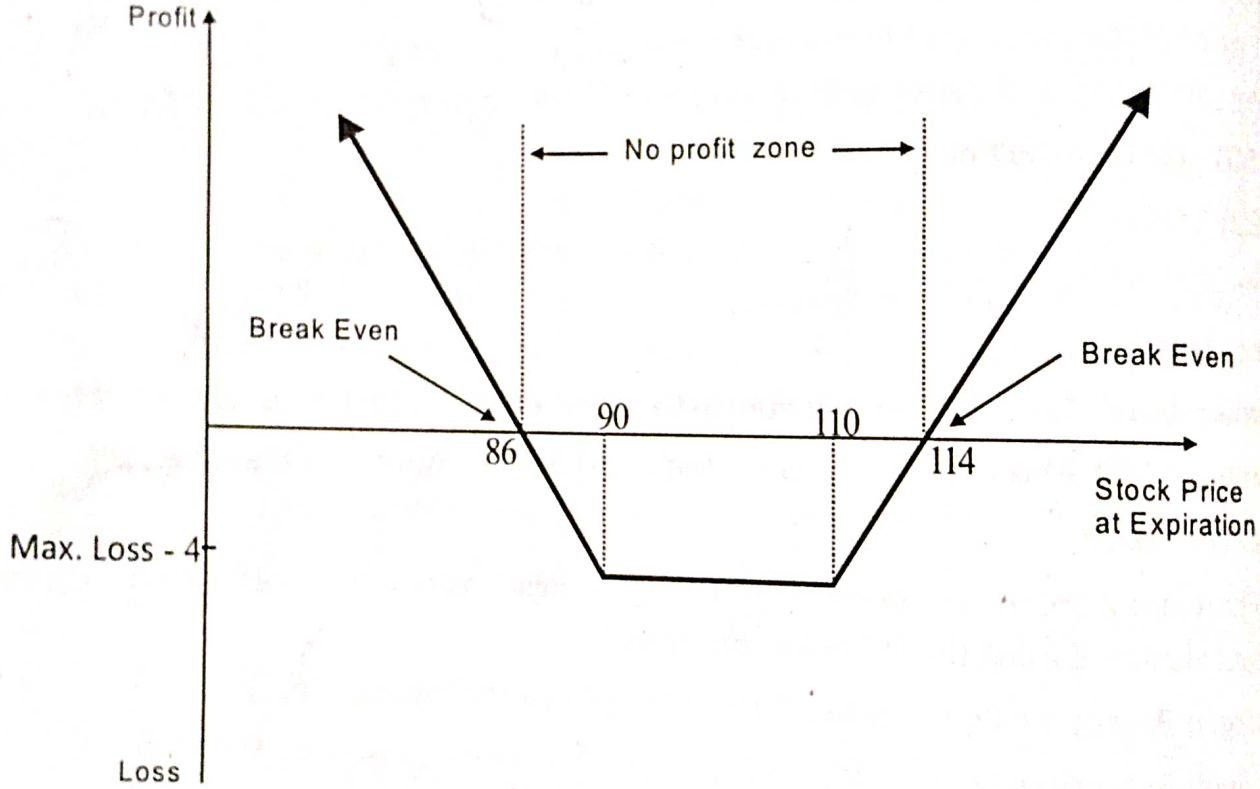
***Example***

Long strangle may be understood with the help of an example. Suppose the cash price of the stock is ₹ 100. A trader buys a call option of ₹ 110 at ₹ 2 premium and a put option at ₹ 90 at a premium of ₹ 2. Total cost of establishing this strangle position is ₹ 4 (total premium). Suppose market price at the expiration date is ₹ 75. The trader would not exercise the call option. This is because he has to pay ₹ 110 (strike) for which the market price is ₹ 75. In the meantime he will sell the stock (put). That is, he can sell at ₹ 90 when the market price is ₹ 75. This will result in a profit of ₹ 11 (15 - 4). Suppose the market price is ₹ 86. Then he would not exercise the call option. He would exercise the put option (sell at ₹ 90 when the market prices is ₹ 86). Now there is no profit no loss (90 - 86 - 4). This is the downside BEP for the long position. Suppose the market price is ₹ 114. He will exercise the call option (buy at ₹ 110 when the market price is ₹ 114). Here the gross profit is ₹ 4 (114 - 110). But he would not sell the put.

This is because he can sell the stock only at ₹ 90, but the market price is ₹ 114. The total premium paid by him is ₹ 4. Now there is no profit no loss (4 - 4). This is the upside BEP for the long position. If the market price is ₹ 120, he will buy the stock (call option at ₹ 110). This provides an income (G/P) of ₹ 10. But he would not sell the stock at ₹ 90 when the market price is ₹ 120. The total premium paid is ₹ 4. So the net profit is ₹ 6 (i.e., 10 - 4).

Then the investor will incur the maximum loss of ₹ 4 (total premium paid) if the cash price lies between ₹ 90 and ₹ 110. But if it is between ₹ 86 and ₹ 90 or ₹ 110 and ₹ 114, his loss will depend upon actual price of the asset in the cash market. If the price goes above the strike price of the call or goes below the strike price of the put, the investor will get profit.

The pay- off for long strangle is shown in the following diagram :




*Long Strangle Pay-off* (Fig. 17)

**When to Use the Long Strangle Strategy**

Long strangle is used when an investor expects volatility but he doesn't know in which direction it is going to move.

**Short Strangle :** In the case of a short strangle, the trader writes (or sells) a combination of one call option with a lower strike price ( out-of-the-money call) and one put option with a higher strike price (out-of-the-money put). A short strangle is similar to the short straddle except the strike prices are further apart.

**Short Strangle Construction**

Sell 1 OTM Call

Sell 1 OTM Put

**Profit or Loss**

**Maximum Loss**: Maximum loss is unlimited as the market moves in either direction.

**Maximum Profit**: But the maximum gain is limited to the premium received for selling the options.

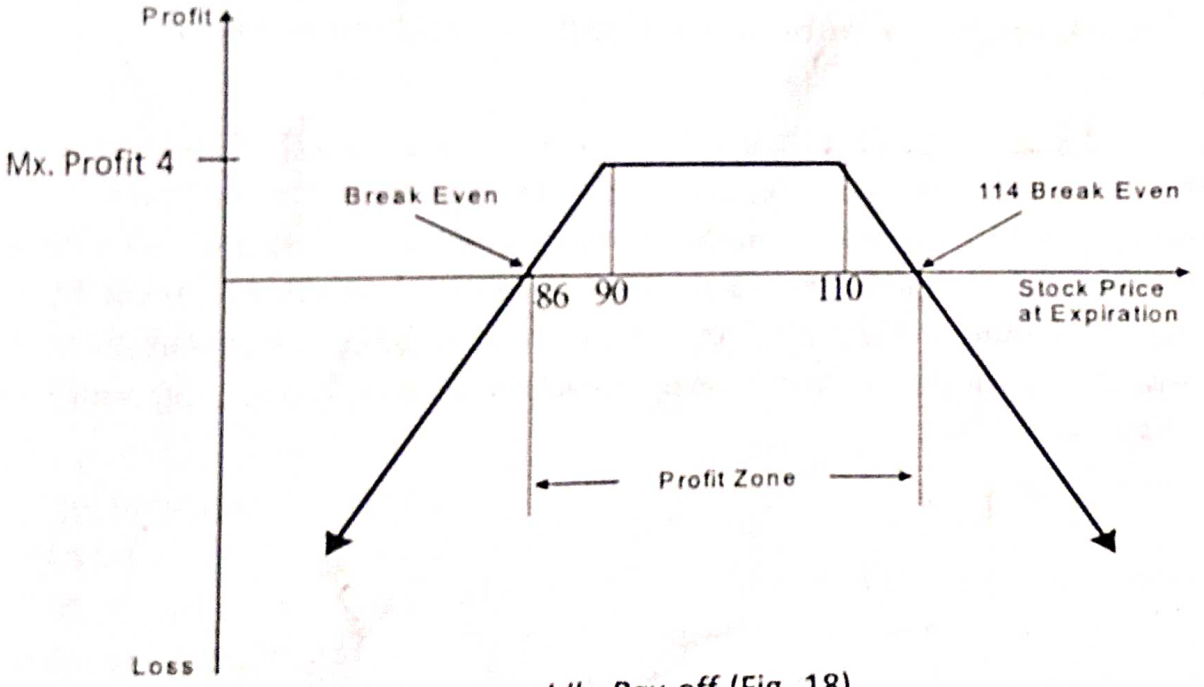
**Break Even Points**

There are 2 break-even points for the short strangle position. The breakeven points can be calculated using the following formulae:

- Upper Breakeven Point = Strike Price of Short Call + Net Premium Received
- Lower Breakeven Point = Strike Price of Short Put - Net Premium Received

The buyer's loss becomes the seller's profit. Seller's maximum profit is limited to the premium received by him. It will occur when the market price is in between ₹ 90 and ₹ 110. If the price goes above the strike price of call or goes below the strike price of put, the seller will incur loss which is unlimited (students may verify this with the help of their own examples).

The profit or loss diagram of a Short Strangle is given below :




*Short Straddle Pay-off* (Fig. 18)

**When to Use the Short Strangle Strategy**

A short strangle is used when an investor expects a low volatility and thinks that the market prices will remain stable.

**3. Strap**

Strap is the reverse of strip. In this strategy, the trader buys two call options and one put option at the same strike price and maturity. This strategy is used when the chances of price going up are more than the chances of going it down. Thus, strap is similar to long straddle. The only

difference is the quantity traded (two calls and not one call). When the prices increase, strap strategy will make more profits compared to long straddle because he has bought two calls.

**Strap Construction**

Buy 2 ATM Calls

Buy 1 ATM Put

**Profit or Loss**

**Maximum Loss**: Maximum loss is limited to net premium paid. It occurs when the price of underlying is equal to strike price of calls / puts.

**Maximum Profit**: Profit is unlimited. The gains from upside movement would double when two calls become in-the-money. The gains from upside movement will be larger than straddle and remain same for downside movement.

**Break Even Points**

There are 2 break-even points for the strap position. These are calculated as follows:

- Upper Breakeven Point = Strike Price of Calls/Puts + (Net Premium Paid/ 2)
- Lower Breakeven Point = Strike Price of Calls/Puts - Net Premium Paid

***Example***

Suppose the cash price of stock X is ₹100 and Mr. A buys two calls and one put at strike price of ₹ 100 on payment of a premium of ₹ 5 each. Now his total outflow at the time of buying the strap is ₹ 15. He will lose money between the levels of 85 and 107.5 (break even points). He will incur the maximum loss of ₹ 15, if on expiry, stock price closes at ₹ 100. When there is an upward move in the price of underlying, the two call options generate more profits than the loss of only one put option in case of a downward move. The pay -off profile of a strap buyer is shown below:

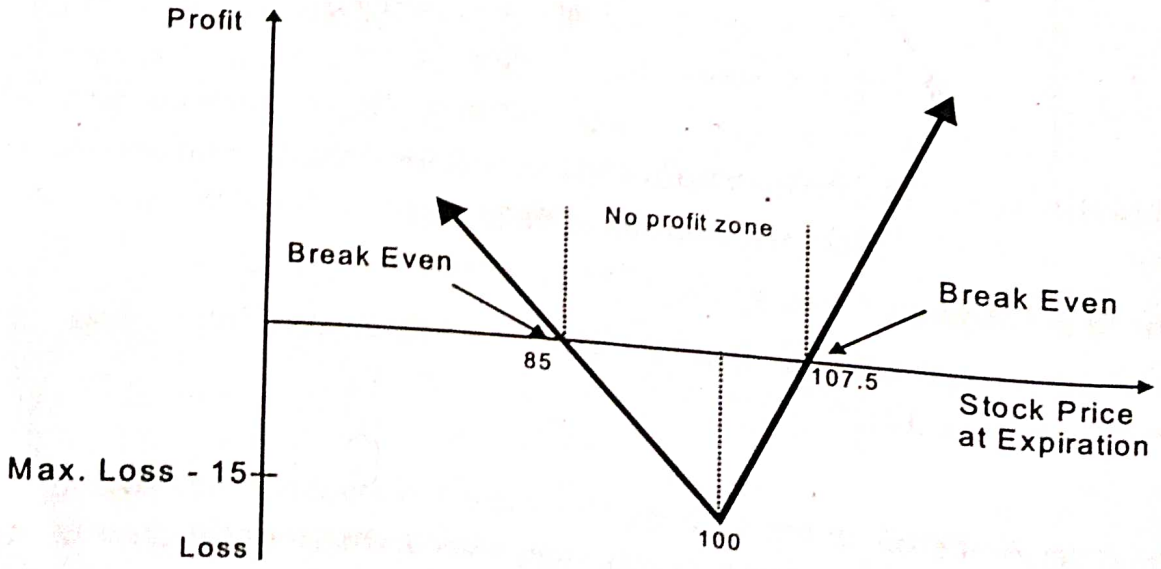



Fig. 19

A strap seller will achieve the maximum profit if price of stock is the same as the strike price, i.e., ₹ 100 at the expiry of the options and it will be equivalent to the total premium received, i.e., is ₹ 15.

The profit or loss diagram of a Strap Seller is given below :

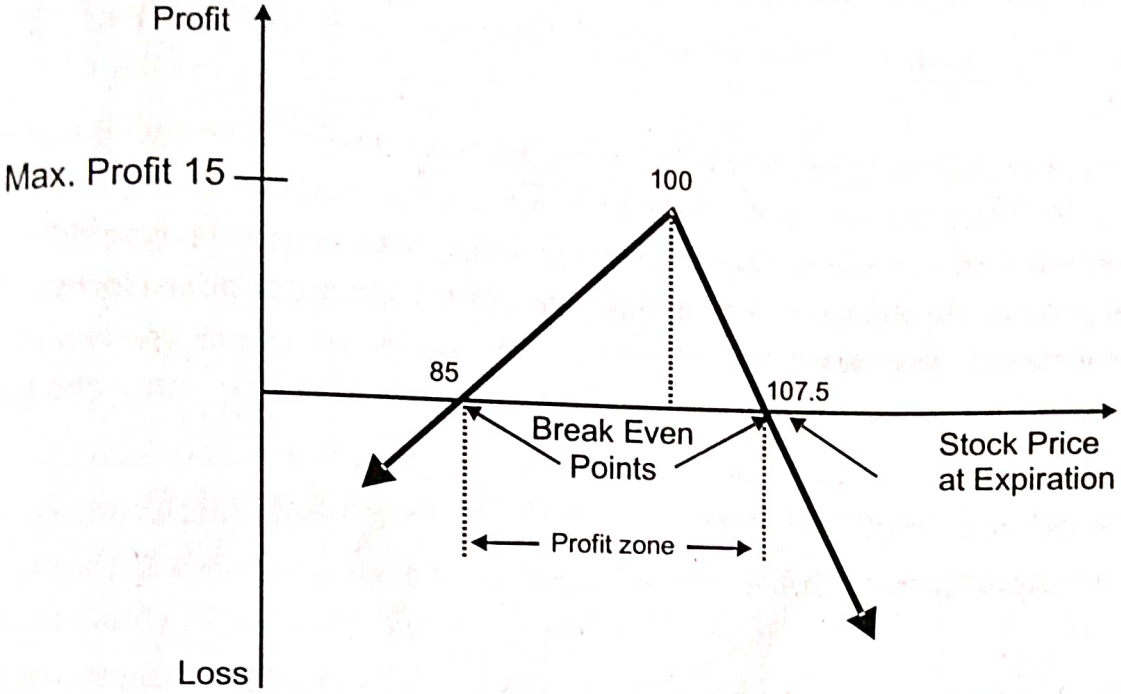



Fig. 20

**When to Use the Strap Strategy**

Strap is used when the option trader thinks that the underlying stock price will experience significant volatility in the near future and is more likely to move upwards instead of falling downwards.

**4. Strip**

Strip involves buying one call and two puts with the same expiry date and strike price. This strategy may be adopted when chances of prices going down are more than the chances of going it up. If the prices move downwards then this strategy will make more profits because of the double quantity (two puts) involved. This means that the 2 put options generate more profit than the loss on call. Thus, strip is a modified, more bearish version of the common straddle.

**Strip Construction**

Buy 1 ATM Call

Buy 2 ATM Puts

**Profit or Loss**

**Maximum Loss:** Maximum loss is limited. Maximum loss = Net premium paid + Commission paid

**Maximum Profit:** Profit is unlimited.

**Break Even Points**

There are 2 break-even points for the strip position. The breakeven points can be calculated using the following formulae:

- Upper Breakeven Point = Strike Price of Calls/Puts + Net Premium Paid
- Lower Breakeven Point = Strike Price of Calls/Puts - (Net Premium Paid ÷ 2)

***Example***

Suppose cash price of stock X is ₹ 100. A trader buys one call and two put options at a strike price of ₹ 100 on payment of a premium of ₹ 5 each. His total outflow at the time of buying the strip is ₹ 15 (Premium). Trader will lose money between the levels of 92.50 and 115 (break even points). He will suffer a maximum loss of ₹ 15, if stock price closes at ₹ 100 on expiry. In the case of downward move in price of the underlying stock the two put options generate values for the trader. But in the case of an upward move, only one call option generates profit.

The pay- off position of strip buyer is shown in the following diagram:

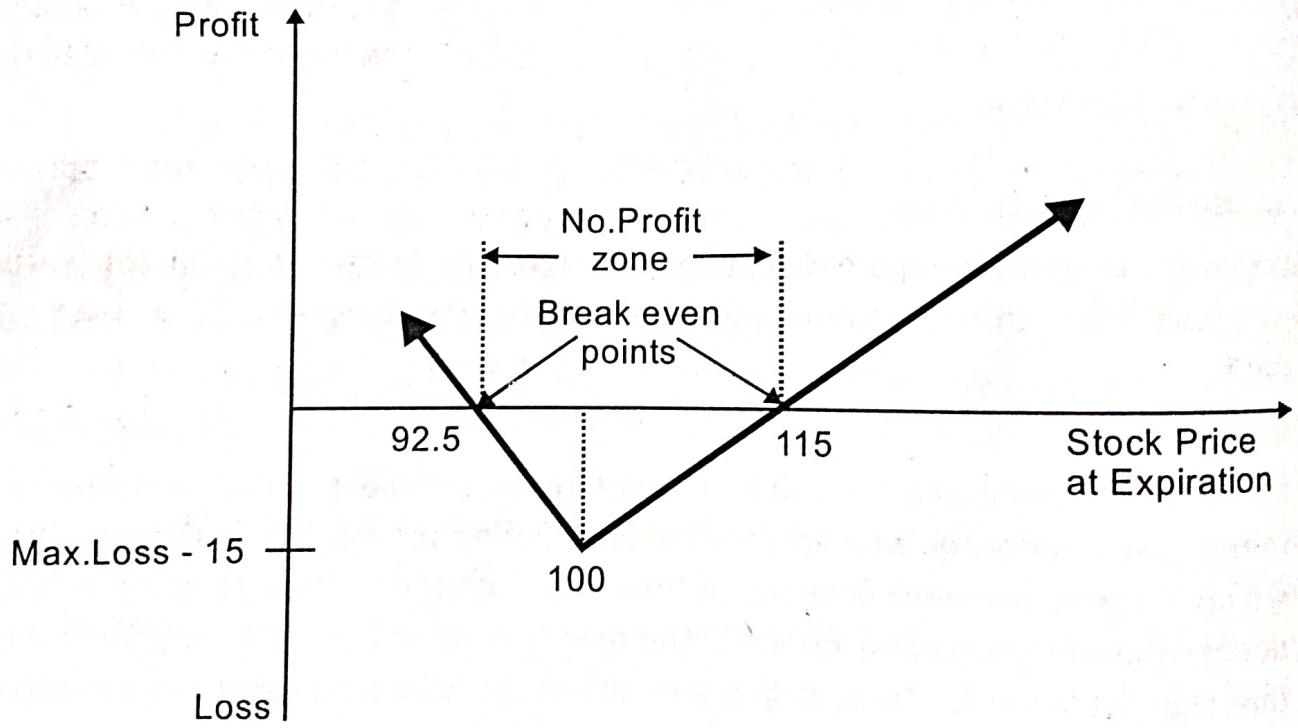



Fig. 21

When price goes down, two puts become in-the-money. When prices go up only one call becomes in-the-money, making gains unequal for same rise than fall in the price.

The strip seller will earn the maximum profit if price of the stock happens to be the strike price of the options, i.e., ₹ 100 at expiry of the options. The maximum profit will be equivalent to the total premium received, i.e., ₹ 15.

The pay-off profile of the strip seller is shown in the following graph :

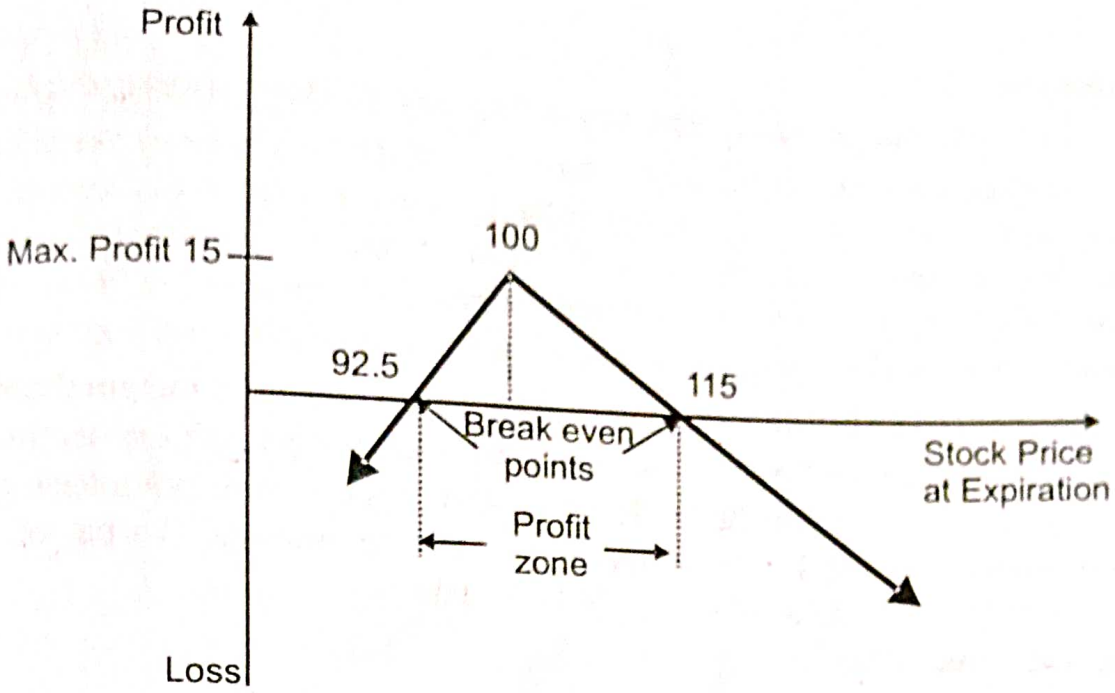



Fig. 22

**When to Use the Strip Strategy**

Strip is used when the option trader thinks that the underlying stock price will experience significant volatility in the near future and is more likely to fall downwards instead of rising.

**5. Option Spreads Strategy**

Combinations, as discussed above are created by using two different types of options on the same asset and same expiration dates. Spreads are created with positions on the same type of options on the same asset but with different strike prices. Thus, an option spread trading strategy involves taking a position in two or more options of the same type simultaneously on same asset but with different strike prices.

Option spread may be classified under three categories: vertical spreads, horizontal spreads and diagonal spreads.

*Vertical spreads:* This is an option spread made by combination of options (either call or put) having different strike prices but the same maturity. For example , an investor simultaneously buys a March put option on Tisco stock with a strike price of ₹ 875 and simultaneously sells a March put option on Tisco stock with a strike price of ₹ 870.

*Horizontal spread:* This strategy involves taking option position in similar options (either call or put ) having different expiration dates but with the same strike price. For example, an investor simultaneously buys a July call option on SBI stock with a strike price of ₹ 740 and sells August put option on same SBI stock with the same strike price of ₹ 740.

*Diagonal spread:* This involves taking position in options of the same type with different strike prices and different maturities.

Spread strategies can be evolved for bearish conditions and bullish conditions. Accordingly, spreads can be classified into bull spreads and bear spreads.

**(a) Bull Spreads**

Bull spreads include call bull spread, put bull spread, call back spread, put back spread.

In this strategy, the investor buys a call option on stock (at a lower strike price) and sells a call option with a higher strike price, but with the same maturity. Bull spread is adopted when the prices are expected to go up. Here the trader hopes to make profit from a rise in the price of the underlying. This is a spread strategy because it involves buying one option and selling a related option. Generally, a call with a lower exercise price has a greater premium.

If the stock price lies between the strike price of the two calls, the purchased call is in-the-money while the call sold expires unexercised. Thus the pay-off equals the difference between the stock price and the lower exercise or strike price. If the stock price is greater than the higher exercise or strike price, both options are in-the-money. The pay-off equals the difference between the exercise price of the two options.

**Bull Call Spread Construction**

Buy 1 ITM Call

Sell 1 OTM Call

**Profit or Loss**

**Maximum Loss**: Maximum loss is limited to the premium paid for long call minus the premium received on short call.

**Maximum Profit**: Maximum profit is limited to the difference between the two strike prices minus the net premium paid.

**Break Even Point**

In case of call bull spread, B.E.P is calculated as follows:

- Breakeven Point = Strike Price of Long Call + Net Premium Paid

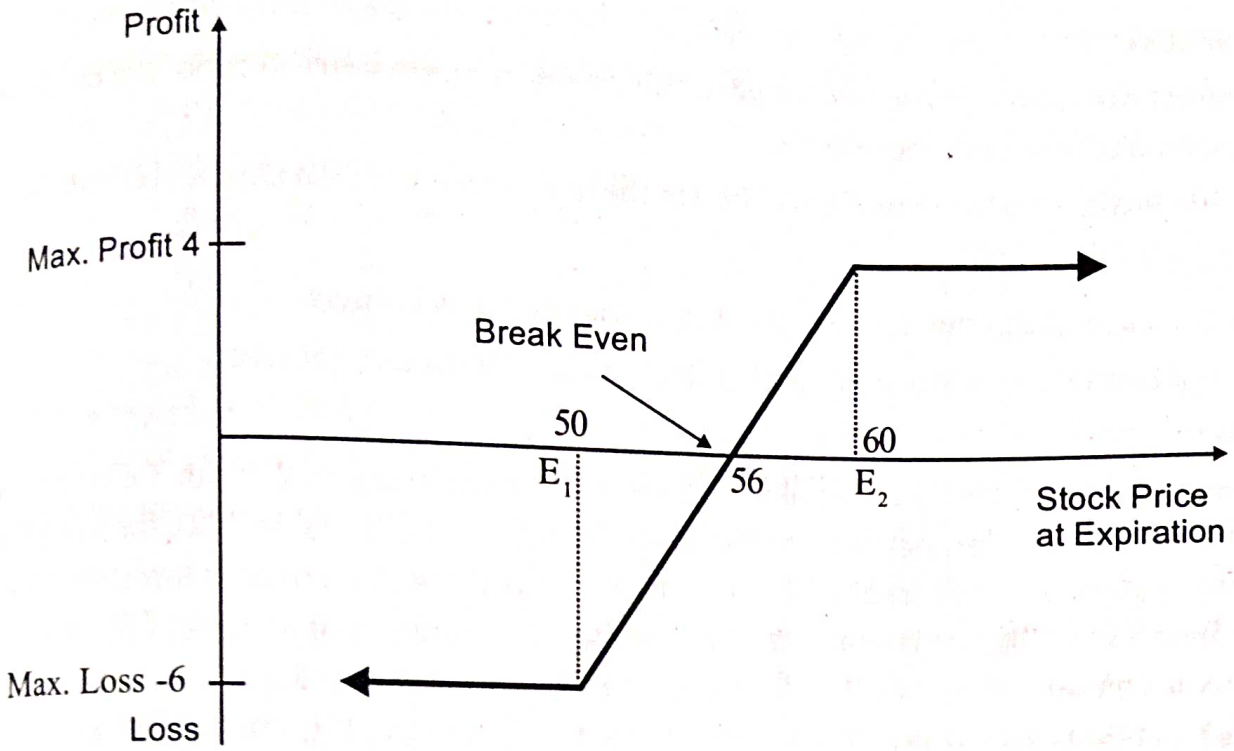
At expiry, if the stock price remains below the lower strike price, both calls would expire unexcercised. Then the loss will be limited to the initial cost of the spread (i.e., the premium paid on both).

***Example***

Suppose you buy a call option with an exercise price of ₹ 50 for ₹ 8 and sell one with an exercise price of ₹ 60 for a premium of ₹ 2 both being on the same stock and with same expiration date. Now if the price rules at ₹ 50 or less, none of them would be exercised, with the result that the pay-off will be nil and the net loss would be ₹ 6 (8 - 2). If the price of stock at the time of exercise is, say, ₹ 58, then the call with an exercise price of ₹ 50 shall be exercised for a pay-off of 58 - 50 = ₹ 8, the net profit being 8 - 8 + 2 = ₹ 2. Finally, if the price of the stock is higher than ₹ 60, both of these will be exercised and the pay-off would be 60 - 50 = ₹ 10 with the net profit equal to 10 - 6 = ₹ 4.

In short, in case of call bull spread (bull spread using calls), the option trader will have one long call with a low strike price and one short call with a higher strike price.

The graphical representation of call bull spread is shown as follows:




*Bull spread using Calls* (Fig. 23 )

$E_1$ and $E_2$ are the respective strike or exercise prices of the calls that are long and short.

**When to Use the Call Bull Spread Strategy**

Call bull spread is used when the trader thinks that the price of the underlying asset will go up moderately in the near future.

**Bull Put Spread**

A bull spread can also be created using puts. This strategy consists of buying an OTM put (at a higher strike price) and selling an ITM put (at a lower strike price) on the same stock (asset) with the same expiry date. The premium received on short put (sell put) is higher than the premium received on the long put (buy put). On expiry, if the stock remains below the lower exercise price, both options are exercised and the position is closed for the difference between the two exercise prices. This results in an overall loss of the initial credit (higher premium received on short put minus lower premium paid on long put) minus the difference. If the stock price is between the two exercise prices, the put with the lower exercise price would expire unexercised resulting in a net profit equal to the initial credit (premium) minus the difference between the exercise price and the stock price. For the stock prices exceeding the higher exercise price, both puts expire unexercised leading to no pay-offs and a net profit equal to the initial credit. In short, in case of put bull spread, the option trader will have long put option with a lower strike price and another short put option with a higher strike price.

**Bull Put Spread Construction**

Buy 1 OTM Put

Sell 1 ITM Put

**Profit or Loss**

**Maximum Loss:** Maximum loss is equal to the difference between the strike prices of the two puts minus net premium received.

**Maximum Profit:** Maximum profit is limited to the net premium received minus commission paid.

**Break Even Point**

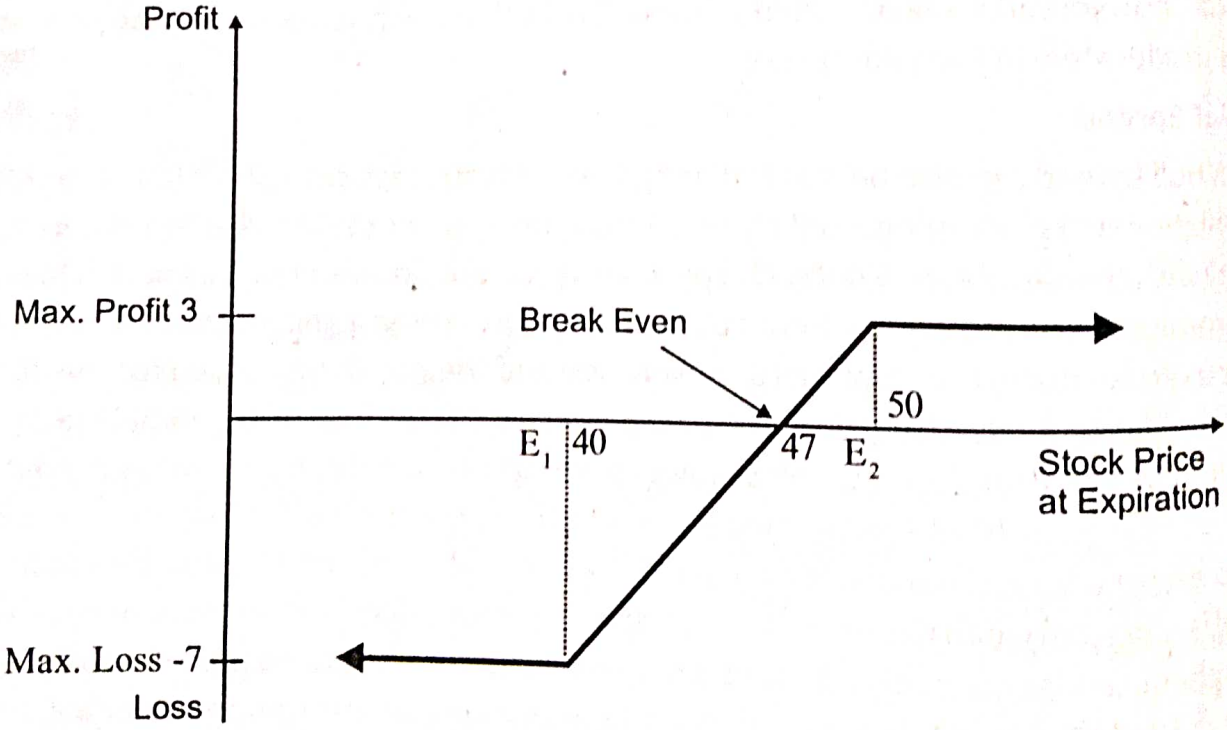
In the case of put bull spread, the BEP is calculated as follows :

Breakeven Point = Strike Price of Short Put - Net Premium Received

***Example***

Suppose an investor buys a put with an exercise price equal to ₹ 40 for ₹ 6 and writes an option identical in all respects except the exercise price that is equal to ₹ 50, for a price of ₹ 9. This spread gives an initial credit of ₹ 3 (premium). Now, if the stock price is less than ₹ 40, then both options are in-the- money and can be exercised. A commitment to buy at ₹ 50 and to sell at ₹ 40 implies an outward pay-off of ₹ 10 and a net loss equal to 10 - 3 = ₹ 7. For a stock price in between the two exercise prices, say, ₹ 44, the investor has to buy the stock at ₹ 50 and thus lose ₹ 6 on the option. In this case, the net loss would be equal to 6 - 3 = ₹ 3. Similarly, when the stock price is more than ₹ 50, none of the options will be exercised and a net profit of ₹ 3 will be made.

The profit or loss diagram of a Bull Put Spread is given below :




*Bull spread using puts* (Fig. 24)

**When to Use the Put Bull Spread Strategy**

Put Bull Spread Strategy is used when the trader thinks that the price of the underlying will go up moderately in the near future.

**Call Back Spread :** This strategy is formulated by buying 2 OTM call options and selling 1 ITM call option of the same underlying stock with the same expiration date. Risk is limited. But the rewards are unlimited if market moves up (rewards are limited when the market moves down).

**Call Back Spread Construction**

Sell 1 ITM Call

Buy 2 OTM Calls

**Profit or Loss**

**Maximum Loss:** Maximum loss is limited to the intrinsic value of the short call plus premium paid (or minus premium received) plus commission paid.

**Maximum Profit: Maximum** profit is unlimited.

**Break Even Points**

There are 2 break-even points for the call back spread position. The break even points can be calculated by using the following formulae:

- Upper Breakeven Point = Strike Price of Long Call + Points of Maximum Loss
- Lower Breakeven Point = Strike Price of Short Call

The profit or loss for Call Back Spread is shown in the following diagram :

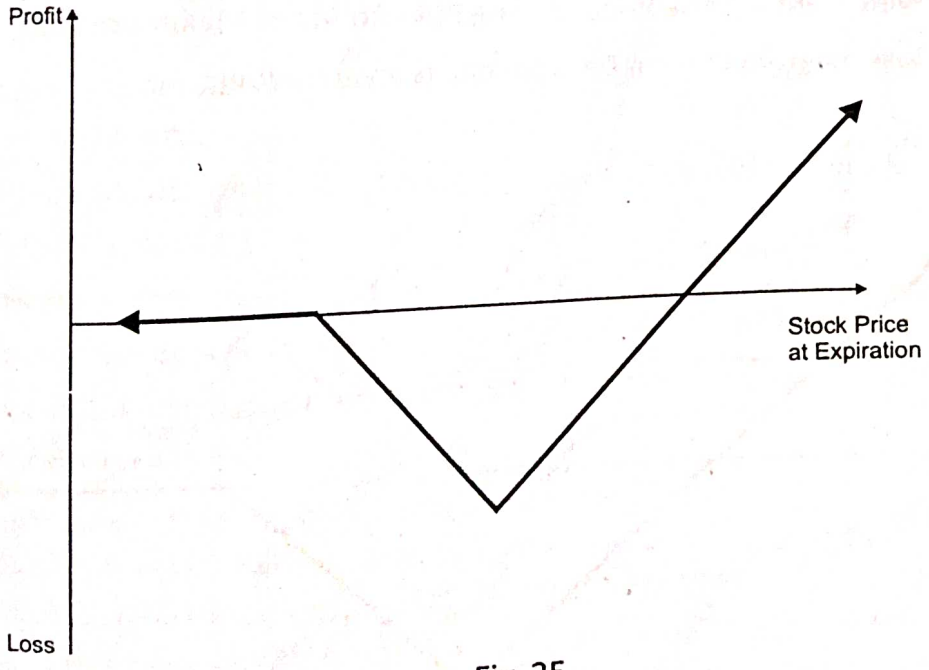



Fig. 25

**When to Use the Call Back Spread Strategy**

Call back spread is used when the option trader thinks that the underlying stock will experience significant upside movement (large jump) in the near future.

**Put Back Spread :** This strategy involves selling one ITM put option (at a higher strike price) and buying two OTM put options (at a lower strike price). When the market price rises the investor gets profit (from selling one put). But if market falls, he gets more profit (from buying two puts). Loss is limited in this strategy.

**Put Back Spread Construction**

Sell 1 ITM Put

Buy 2 OTM Puts

**Profit or Loss**

**Maximum Loss**: Maximum loss is limited. It is equal to the intrinsic value of the short put minus premium received plus commission paid.

**Maximum Profit**: Profit is unlimited. When the stock price makes a strong move to the downside beyond the lower BEP the trader earns profit.

**Break Even Points**

There are 2 break-even points for the put back spread position. The break even points can be calculated using the following formulae:

- Upper Breakeven Point = Strike Price of Short Put
- Lower Breakeven Point = Strike Price of Long Put - Points of Maximum Loss

The profit or loss diagram of a Put Back Spread is given below :

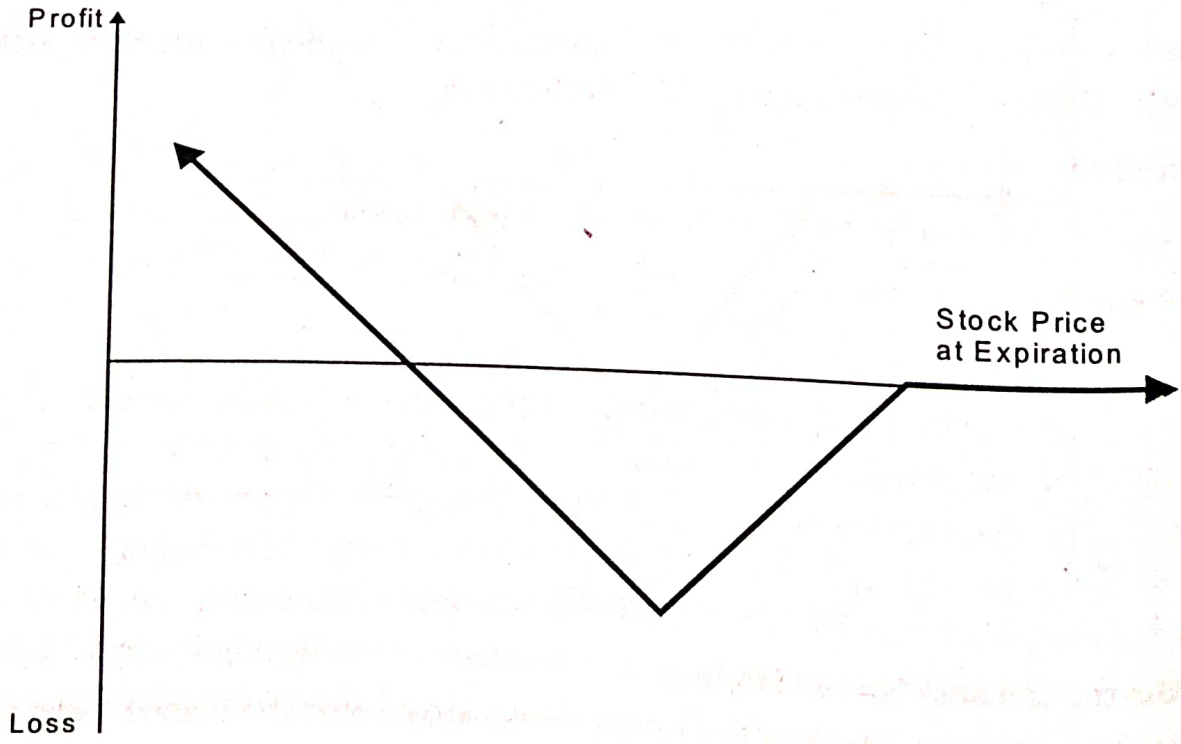



Fig. 26

**When to Use the Put Back Spread Strategy**

Put back spread is used when the options trader thinks that the underlying stock will experience significant downside movement (loss) in the near future.

**(b) Bear Spreads**

This is opposite of bull spread. This strategy is used when an investor believes that the market will be weak in near future, i.e., the market is likely to go down. Bear spreads can be constructed by using calls and puts. Accordingly we have call bear spreads and put bear spreads.

**Bear Call Spread (or Call Bear Spread) :** A bear call spread is created by buying a call with higher strike price and simultaneously writing a call ( selling a call) with lower strike price. It may be noted that the premium for the call sold would be greater than for the call bought. Hence, bear spread would involve an initial cash inflow. This is known as bear spread because the trader will be able to make profit only when prices decrease. It is also known as the *call bear credit spread.* In short, call bear spread is a combination of selling a call with a low strike price and buying a call with higher strike price.

**Bear Call Spread Construction**

Buy 1 ATM Call

Sell 1 ITM Call

**Profit or Loss**

**Maximum Loss**: Maximum loss is limited to the difference between the two strike prices minus the net premium.

**Maximum Profit**: Maximum profit is limited to the difference between the premium received for the short call minus the premium paid for the long call.

**Break Even Point**

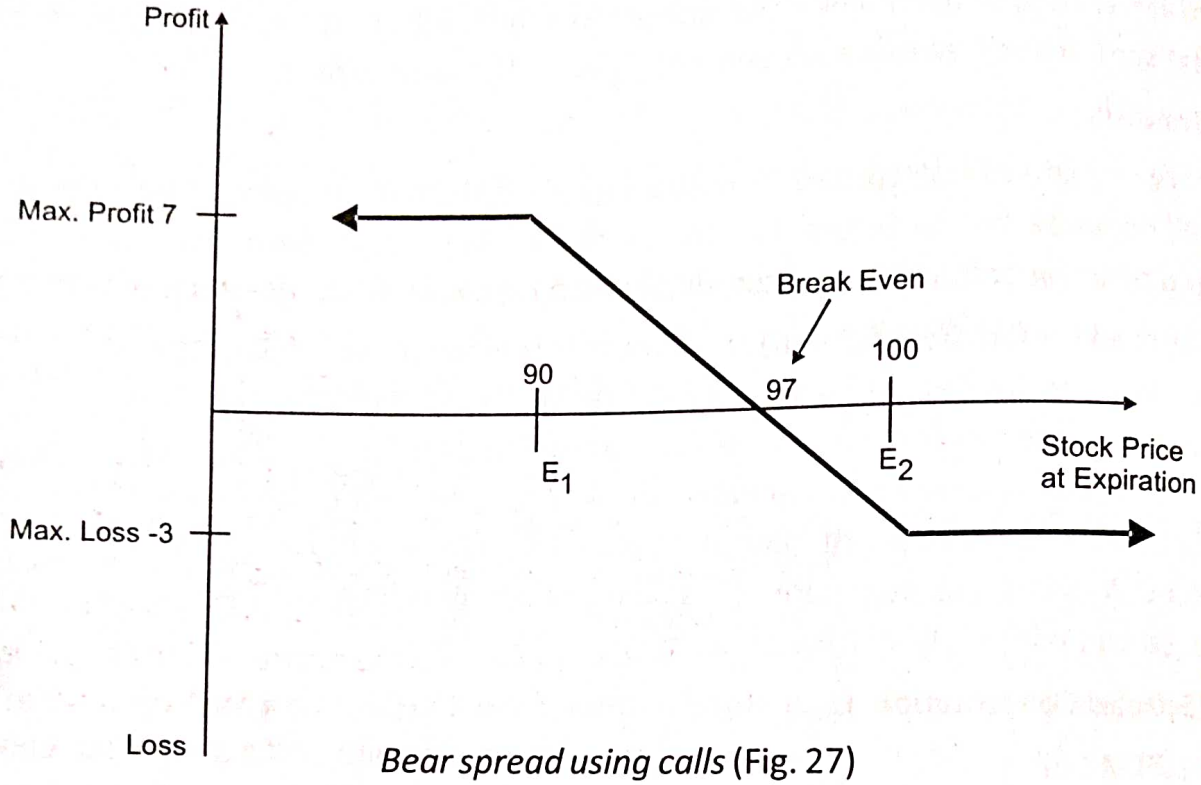
In the case of Call Bear Spread, the BEP is calculated as below :

Breakeven Point = Strike Price of Short Call + Net Premium Received.

***Example***

Suppose the cash market price of SBI stock is ₹ 100. A trader buys a call option at a strike price of ₹ 100 (ATM) for a payment of premium of ₹ 5. He sells a call option at a strike price of ₹ 90 (ITM) and receives a premium of ₹ 12. The net credit is ₹ 7 (at the time, spread is established). If the price of the underlying is at or below ₹ 100, both options will expire worthless and the total profit is ₹ 7. The BEP is ₹ 97. As long as the price of the underlying is lower than ₹ 97, the profit is limited to ₹ 7. If the price of underlying is above ₹ 97, the maximum loss will be ₹ 3 (i.e., 100 - 97). If cash price is above ₹ 100, both options will have an intrinsic value and the spread will result in a loss of ₹ 3.

The profit or loss for Bear Call Spread is shown in the following diagram :




*Bear spread using calls* (Fig. 27)

**When to Use the Call Bear Spread Strategy**

Call bear spread is used when the market direction is moderately bearish. This means the trader expects that the price of the underlying asset will go down moderately in the near future.

**Put Bear Spread :** Bear spreads can also be created by using put options instead of call options. In such a case, the investor buys a put with a high exercise price and sells one put with a low exercise price. This would require an initial investment (cash outflow) because the premium for the put with a higher exercise price would be greater than the premium receivable for the put (sold) with the lower exercise price. In this spread, the investor buys a put with a certain exercise price and chooses to give up some of the profit potential by selling a put with a lower exercise price. In return for the profit given up, the investor gets the price (premium) of the option sold.

Thus, put bear spread is a combination of selling one put option at a low strike price and buying one put option at a high strike price.

**Put Bear Spread Construction**

Buy 1 ATM Put

Sell 1 OTM Put

**Profit or Loss**

**Maximum Loss**: Loss is limited to the net premium paid for the spread. In other words, the premium paid for the long position minus premium received for the short position will be the maximum loss.

**Maximum Profit**: Maximum profit is limited to the difference between the two strike prices minus the net premium paid for the position.

**Beak Even Point**

In case of Put Bear Spread, the BEP is calculated by using the following formula :

Breakeven Point = Strike Price of Long Put - Net Premium Paid

*Example*

Suppose cash market price of scrip X is assumed to be ₹ 100. December put option is bought on scrip X with strike price ₹ 100 (at-the-money option) on payment of a premium of ₹ 5 and another December put option on scrip X with strike price ₹ 90 (out-of-the-money option) is sold on receiving a premium of ₹ 2. This would result in an outflow of ₹ 3 at the time of establishing the spread. If price of the underlying is at or above ₹ 100 both options will expire worthless and the total loss on the position will be net option premium paid, i.e., ₹ 3. The break-even point for this spread position is at the level of ₹ 100 (higher strike price) minus net debit of ₹ 3, i.e., at ₹ 97. This means that the spread position will expire with zero value if underlying asset's price is ₹ 97 at maturity of the options, Furthermore, as long as price of the underlying is lower than ₹ 97, the spread position would result in a profit amounting to the difference between ₹ 97 and actual price of the asset (maximum profit of ₹ 7). For cash price below ₹ 90, both the options will have an intrinsic value and be exercised and the spread position will result in a profit of ₹ 7.

The profit or loss for Bear Put Spread is shown in the following diagram :

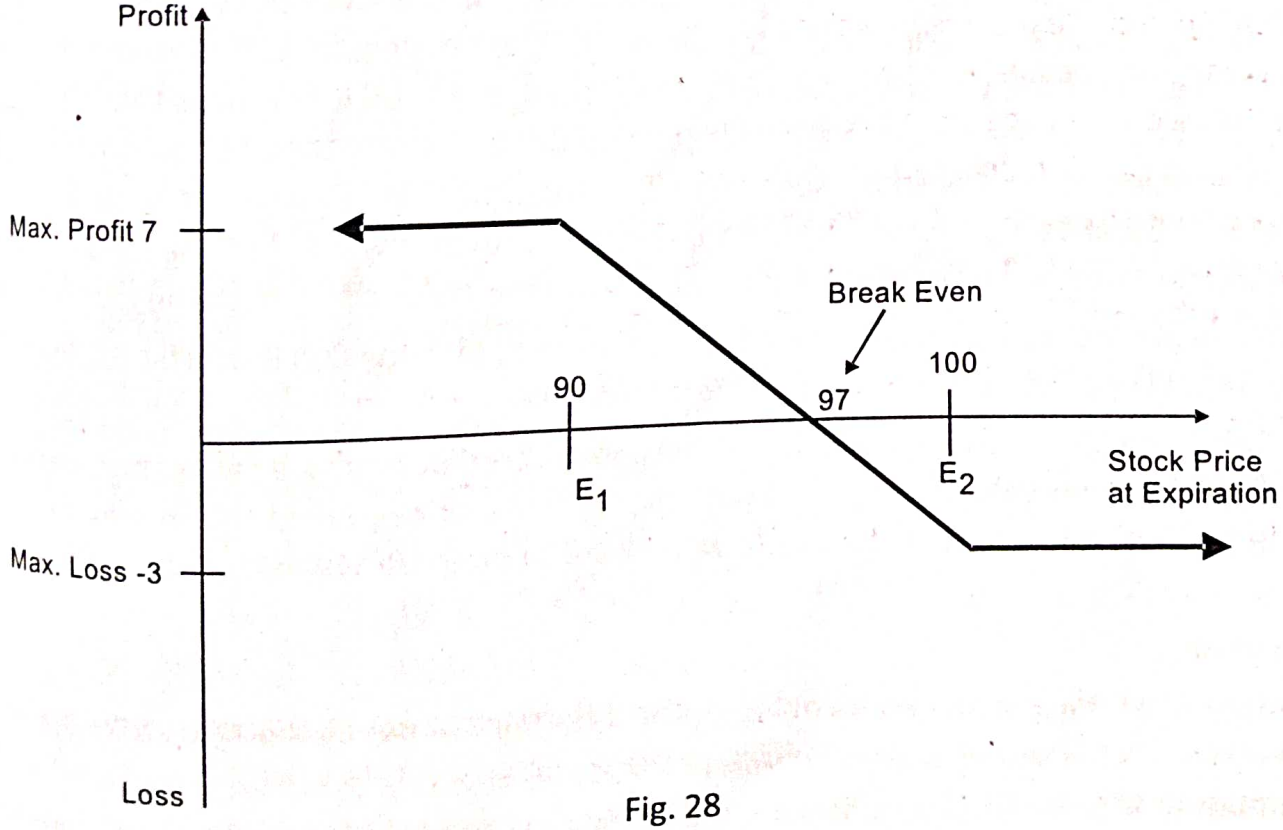



Fig. 28

**When to Use the Put Bear Spread Strategy**

Put Bear Spread strategy is used when the trader expects a bearish trend on market direction. In other words, this strategy is used when the trader thinks that the price of the underlying asset will go down moderately in the near future.

**(c) Butterfly Spreads**

Butterfly spreads can be created through different combinations of call and put options. To establish a butterfly spread, a trader takes positions in four option contracts at three different strike prices. It involves buying one call with strike price $E_1$, buying another call with higher strike price $E_3$, and writing (selling ) two calls at strike price $E_2$, that lies between $E_1$ and $E_3$. The price $E_2$ is usually close to the current stock price. If the stock price stays close to $E_2$, profit will result. A small loss will incur if there is a significant price movement either away from it. This strategy is used by a trader who believes that there would be no large price changes. It may be noted that the call at lower strike price $E_1$ is in-the-money. Therefore, the trader has to pay a larger premium. The other call bought with higher strike price is out-of-the-money and the premium is lower.

**Butterfly Spread Construction**

Buy 1 ITM Call

Sell 2 ATM Calls

Buy 1 OTM Call

If $E_1$, $E_2$ and $E_3$ be ₹ 50, ₹ 60 and ₹ 70 respectively, and the stock price be less than ₹ 50, then, clearly, no call will be exercised. Accordingly, the total loss equals the initial cost involved. Similarly, beyond ₹ 70, when all calls will be exercised, the total loss equals the initial cost, because the gain on the options with long position will be exactly offset by a corresponding loss on the two options written (sold). Gain (profit) would result when the stock price is between ₹ 50 and ₹ 60, and shall be higher as the price moves towards ₹ 60. Beyond this price, the amount of gain would decline with an increase in the stock price up to the level of ₹ 70.

There are four types of Butterfly spreads. They are : (a) Long Call Butterfly, (b) Short Call Butterfly, (c) Long Put Butterfly, (d) Short Put Butterfly.

**Long Call Butterfly :** The long butterfly can be constructed by buying a call with lower strike price (in-the-money call), buying a call with higher strike price (out-of-the-money call), and writing (selling) two at-the-money calls with strike price in between the above two strike prices.

**Profit or Loss**

**Maximum Loss**: Maximum loss is limited to the difference between the ATM strike price and ITM strike price minus net premium paid for the spread.

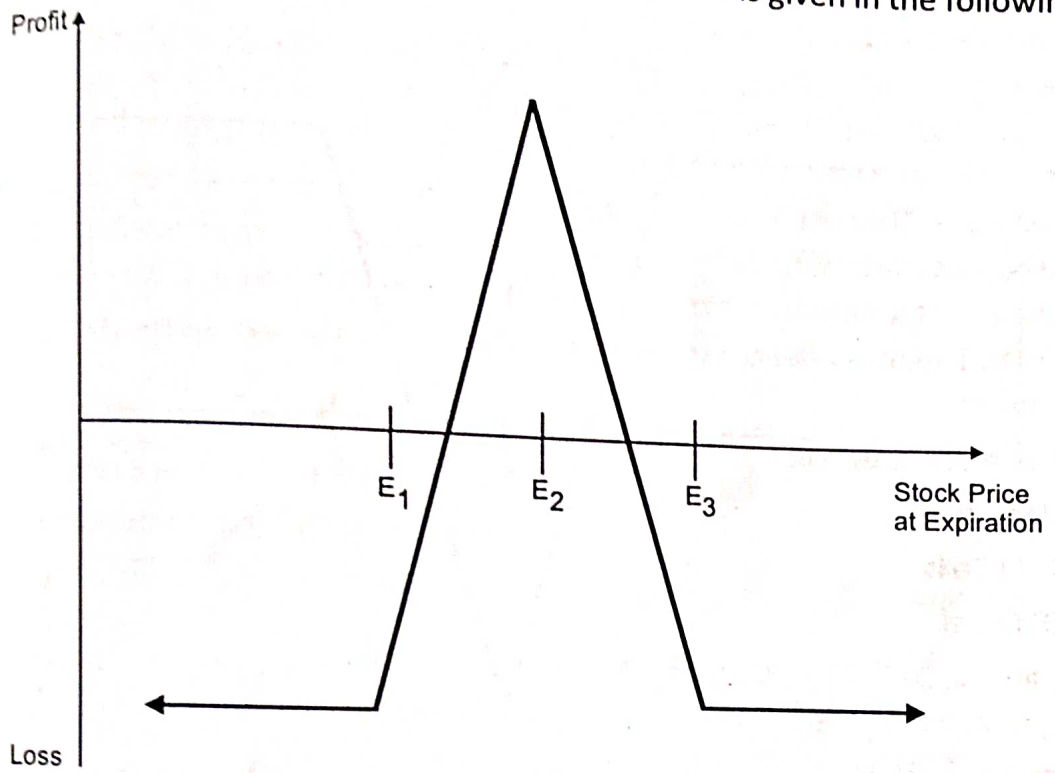
**Maximum Profit**: Maximum profit is limited to the net premium received from the spread.

**Break Even Points**

There are 2 break-even points for the butterfly spread position. The breakeven points can be calculated by using the following formulae:

- Upper Break Even Point = Strike Price of Higher Strike Long Call - Net Premium Paid
- Lower Break Even Point = Strike Price of Lower Strike Long Call + Net Premium Paid

The profit/loss profile for a Long Call butterfly Spread is given in the following graph:




*Long Call Butterfly Spread* (Fig. 29)

**When to Use the Long Call Butterfly Spread Strategy**

Long call butterfly spread is used when the investor thinks that the underlying stock will not rise or fall by expiration, i.e., the investor is neutral on market direction and bearish on volatility.

**Short Call Butterfly :** A short call butterfly option strategy consists of the following three options :

(i) Selling one call option with a relatively high strike price say $E_1$

(ii) Selling one call option with a relatively low strike price say $E_3$

(iii) Buying two call options with a strike price say $E_2$, halfway between $E_1$ and $E_3$.

**Profit or Loss**

**Maximum Loss**: Maximum loss is limited to the difference between the ATM strike price and ITM strike price minus net premium received from the spread.

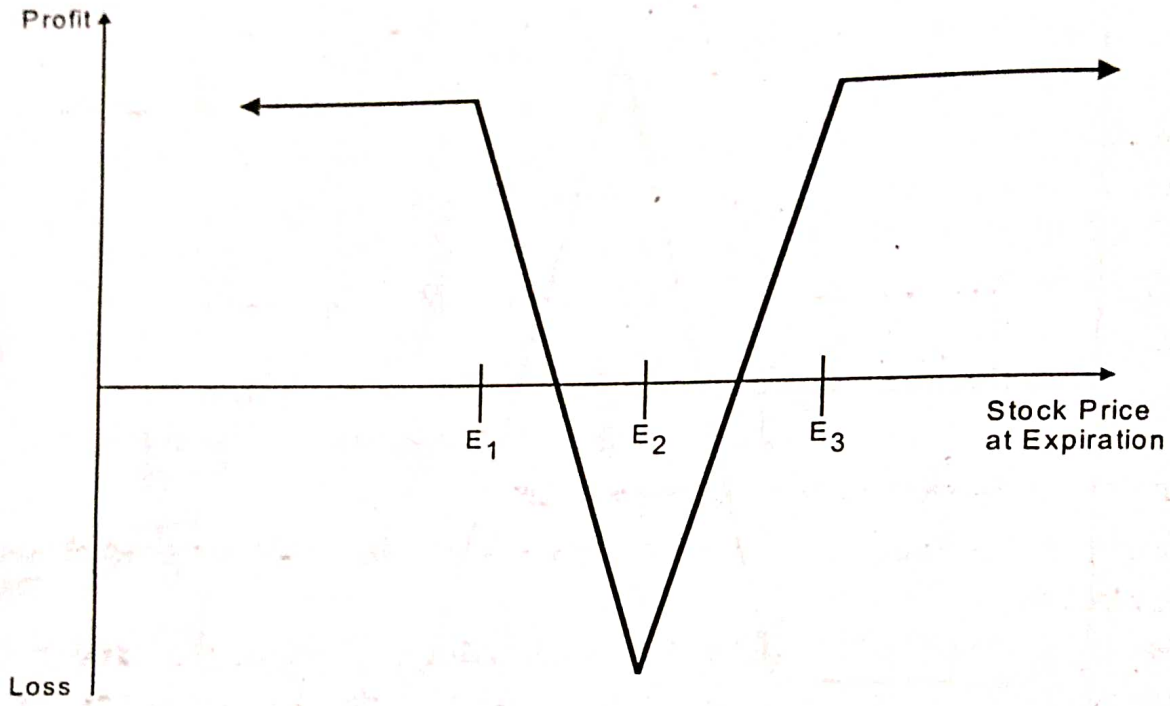
**Maximum Profit**: Maximum profit is limited to the net premium received for the position.

**Break Even Points**

There are 2 break-even points for the short call butterfly spread position. The break even points can be calculated by using the following formulae:

- Upper Break Even Point = Strike Price of Highest Strike Short Call - Net Premium Received
- Lower Break Even Point = Strike Price of Lowest Strike Short Call + Net Premium Received

The profit or loss for Short Call Butterfly Spread is shown in the following diagram :




*Short Call Butterfly Spread* (Fig. 30)

**When to Use the Short Call Butterfly Spread Strategy**

Short call butterfly spread is used when the trader is neutral on market direction and bullish on volatility.

**Long Put Butterfly :** A Long Put Butterfly involves the following tradings :

Selling two ATM Put options

Buying one ITM Put option

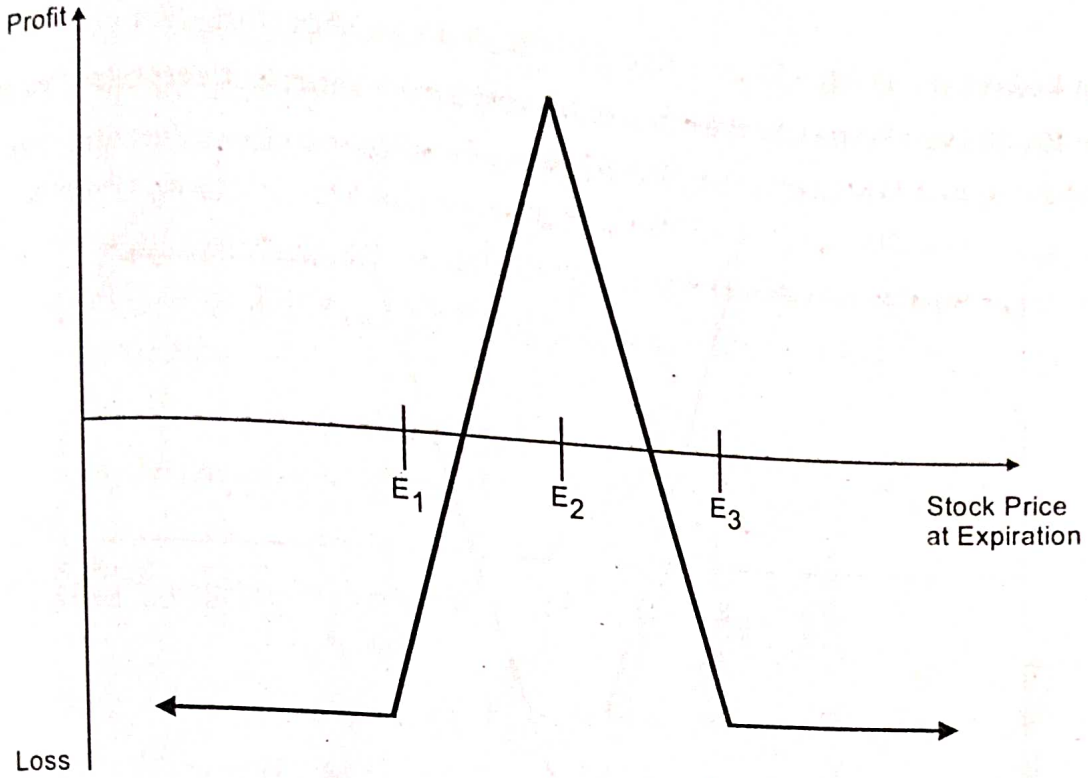
Buying one OTM Put option

**Profit or Loss**

**Maximum Loss**: Maximum loss is limited to the difference between the ATM strike price and ITM strike price minus net premium paid for the spread.

**Maximum Profit**: Maximum profit is limited to the net premium received from the spread.

The profit or loss for long put butterfly spread is shown in the following diagram:




*Long put butterfly spread* (Fig. 31)

**When to Use the Long Put Butterfly Spread Strategy**

Long put butterfly spread is used when the trader is neutral on market direction but bullish on volatility.

**Short Put Butterfly :** This is a limited profit, limited risk option strategy. There are 3 strike prices involved in a short put butterfly. It can be constructed by writing one out-of-the-money put with lower strike price, buying two at-the-money puts (with strike price in between the lower and higher strike prices) and writing another in-the-money put with higher strike price.

**Short Put Butterfly Construction**

Sell 1 ITM Put

Buy 2 ATM Puts

Sell 1 OTM Put

**Profit or Loss**

**Maximum Loss:** Maximum loss is limited to the difference between the ATM strike price and ITM strike price minus net premium received for the position.

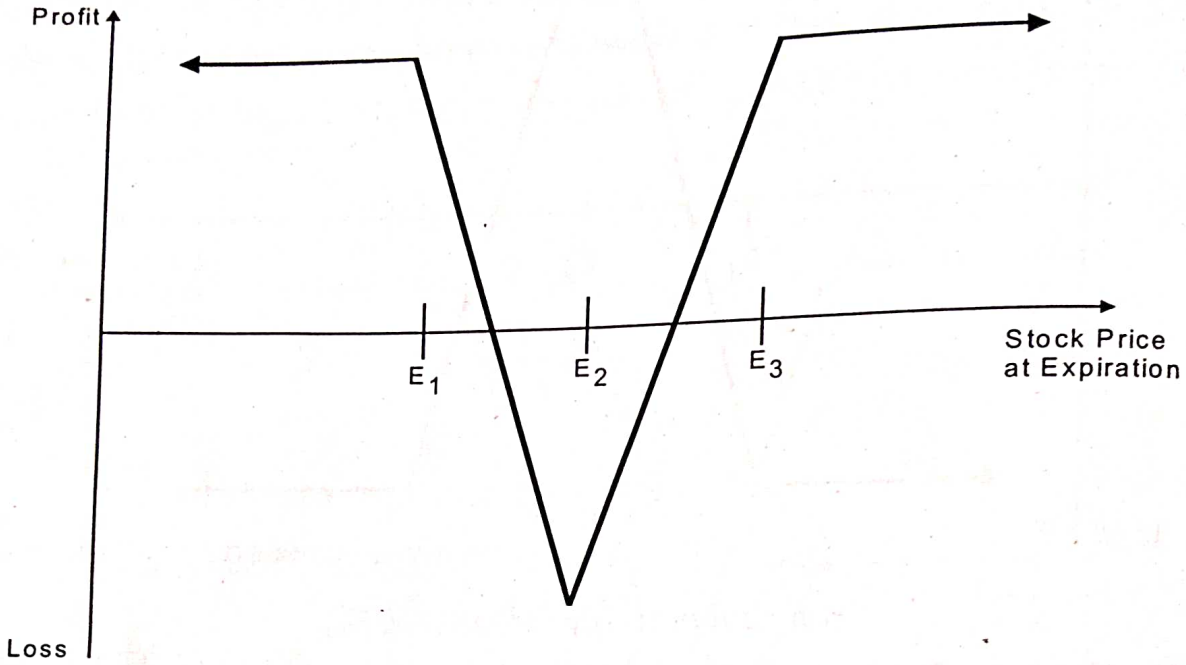
**Maximum Profit:** Maximum profit is limited to the net premium received from the spread.

**Break Even Points**

There are 2 break-even points for the short put butterfly position. The break even points can be calculated by using the following formulae:

- Upper Break Even Point = Strike Price of Highest Strike Short Put - Net Premium Received
- Lower Break Even Point = Strike Price of Lowest Strike Short Put + Net Premium Received

The profit or loss for short put butterfly spread is shown in the following diagram :




*Short Put Butterfly Spread* (Fig. 32)

**When to Use the Short Put Butterfly Spread Strategy**

Short put butterfly spread is used when the trader is neutral on market direction (market may go on either direction, i.e., rise or fall) but bullish on volatility.

*Iron Butterfly* : This strategy is implemented when a trader is bearish on the volatility of market and neutral on the market movements. In this strategy a trader buys 1 OTM put option, sells 1 ATM put option, sells 1 ATM call option, and buys 1 ATM call option. Due to offsetting of long and short positions, this strategy earns limited profit with limited risk.

**(d) Condor Spreads**

Condor (also known as iron condor) is a modified version of strangle. It is a variant to the butterfly spread. It is less risky than strangle. It uses four strike prices- $E_1$, $E_2$, $E_3$ and $E_4$ with $E_1 < E_2 < E_3 < E_4$. It uses two vertical spreads - a call vertical spread and put vertical spread. It involves four call options or four put options.

The literary meaning of "condor" is a very large South American Vulture. Here, the option position is so named because of the shape of the Profit/Loss graphs, which resembles a large bodied bird, such as a condor. The traders often refer to the inner options collectively as the "body" and the outer options as the "wings". Conceptually, a condor consists two parts, one part is called the outer strikes and other one is called the inner strikes. To understand the concept and methodology of a condor option trading strategy, one should get an idea about its shape.

Condor spreads are of two types- long condor or short condor.

(i) **Long Condor**: A long condor involves call options. It is created by buying calls, with two outer strike prices, i.e., $E_1$, and $E_4$ ($E_1$ is lowest and $E_4$ is largest) and selling two calls with strike prices in between $E_1$ and $E_4$. $E_2$ is higher than and closer to $E_1$, and $E_3$ is lower than and closer to $E_4$. Thus, long condor involves buying option contracts for the outside strike prices and writing the option contracts for the inner strike prices.

**Long Condor Construction**

Sell 1 ITM Call

Buy 1 ITM Calls (Lower strike price)

Sell 1 OTM Call

Buy 1 OTM Call (Higher strike price)

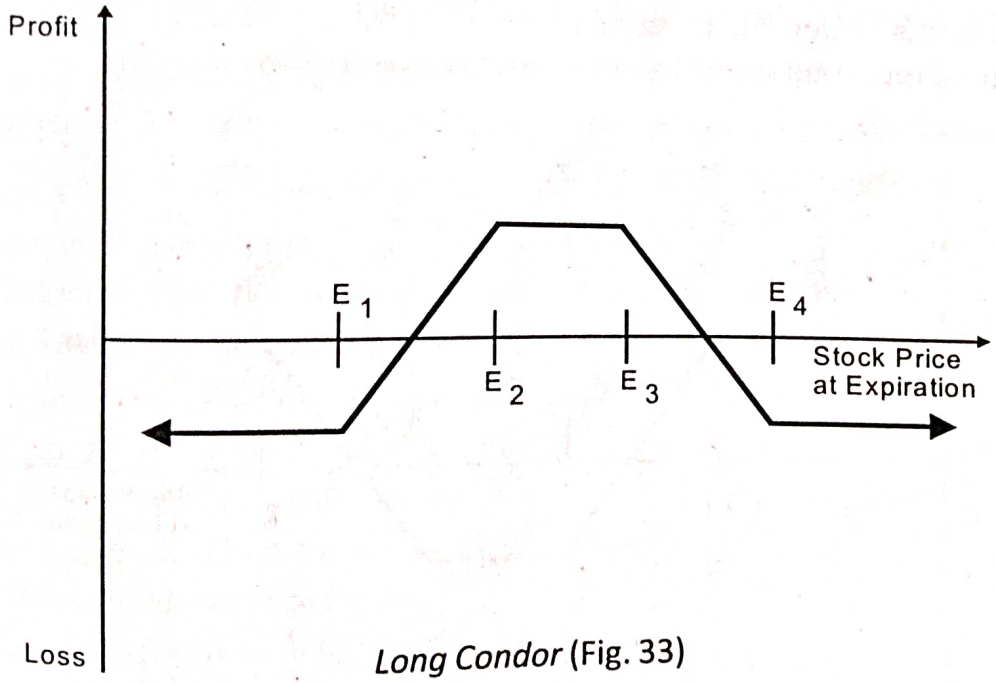
**Profit or Loss**

**Maximum Loss**: Maximum loss occurs at the wings of the option spread.

**Maximum Profit**: Maximum profit is limited to the difference between the premium received on the calls written and premium paid on the calls purchased.

Condor is also a combination of bull and bear spreads; a bull spread with lower strike price and a bear spread with a higher strike price.

The graphical representation of long condor is shown as below:




*Long Condor* (Fig. 33)

**When to Use the Long Condor Strategy**

Long condor is used when the trader expects volatility of the price of the underlying asset to be low.

**Long Condor using Put Option**

A long condor using put option can be created by buying one put option with exercise price $E_1$ and buying another put call with an exercise price of $E_4$, and selling two puts with exercise price $E_2$ and $E_3$. $E_2$ and $E_3$ lie in between $E_1$ and $E_4$.

**(ii) Short Condor**: This is the reverse of long condor. Short condor involves selling two calls with strike prices of $E_1$ and $E_4$ (Outer strike prices) and buying two calls with strike prices of $E_2$ and $E_3$ (Inner strike prices).

The short condor is a neutral strategy similar to the short butterfly. It is a limited risk, limited profit trading strategy that is structured to earn a profit when the underlying stock is perceived to be making a sharp move in either direction.

**Short Condor Construction**

Buy 1 ITM Call

Sell 1 ITM Call (Lower Strike)

Buy 1 OTM Call

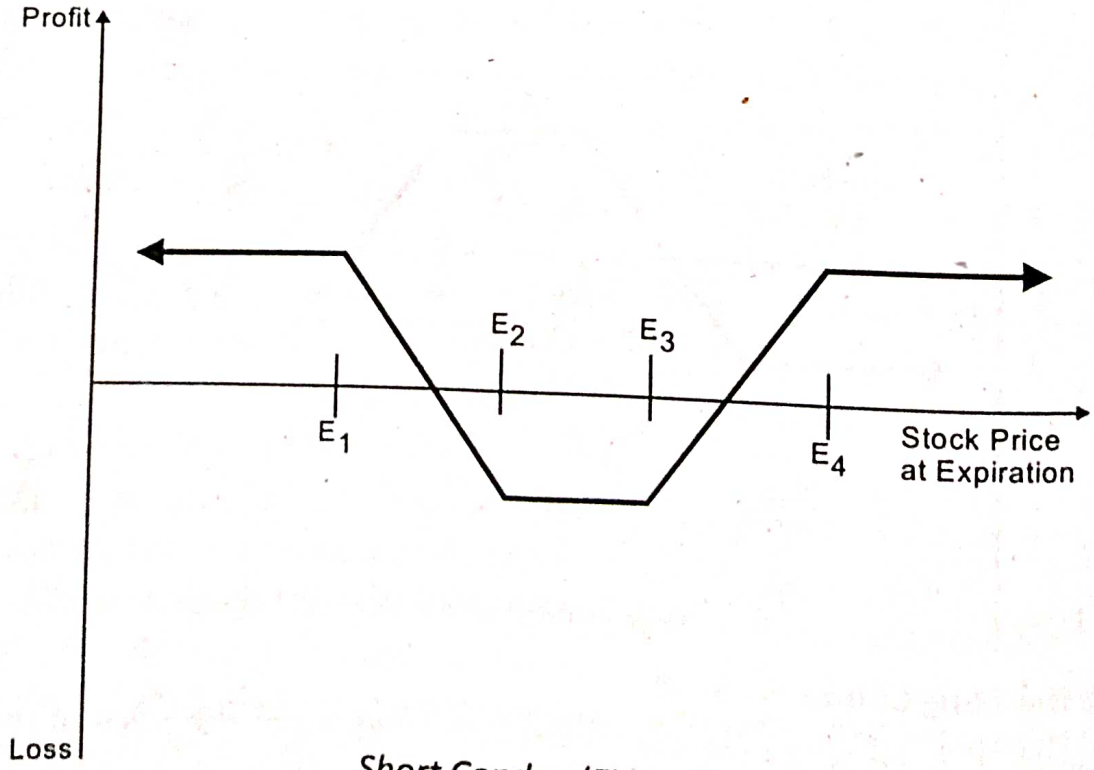
Sell 1 OTM Call (Higher Strike)

**Profit or Loss**

**Maximum Loss**: Maximum loss is limited to the premium paid.

**Maximum Profit**: Maximum profit occurs at the wings. It is the difference between the lower strike call spread and the higher call spread plus the total premium received for the condor.

The graphical representation of short condor is given below:




*Short Condor* (Fig. 34)

**Break Even Points**

There are 2 break-even points for the short condor position. The break even points can be calculated by using the following formulae:

Upper Break Even Point = Strike Price of Highest Strike Short Call - Net Premium Paid

Lower Break Even Point = Strike Price of Lowest Strike Short Call + Net Premium Paid

**When to Use the Short Condor Strategy**

Short condor is used when the trader expects that stock price will move sharply in either directions.

**(e) Calendar Spreads**

Calendar spreads are formed by using the options on the same asset with same strike price but with different expiration dates. An investor of calendar spread aims at making profit based on the time value of options. A bullish investor thinks that the price of the asset would not increase enough in the near future but would exceed a predetermined level in the long run. Therefore, he buys a distant call (say 3 months) and writes (sells) a near call (say 1 month). He expects that the distant call would be in-the-money on maturity and cost would be reduced by writing a near call. Only very experienced investors use such a strategy. A bearish investor may buy a near call but write a distant call with the expectation that price would rise enough in the near future to make the near call in-the-money but will fail thereafter so as to make the distant call out-of-the-money. The investor gets greater premium on the call written ,while he pays lower premium for buying the near call. Calendar spread is also known as *time spread*.

**(f) Box Spreads**

A box spread is a combination of bull and bear spread with calls and puts respectively with the same set of strike prices. It is a common arbitrage strategy that involves buying a bull call spread together with the corresponding bear put spread, with both vertical spreads having the same strike prices and expiration dates.

A box spread is created by (a) buying a call and writing a put at the same strike price, and (b) simultaneously selling another call and buying a put again at same strike price but different from those in (a). Generally this strategy is adopted by risk-averse investors. This strategy always gives a pay-off. The pay -off is the difference between higher and the lower strike prices. In a box spread strategy the profit or loss made is independent of the stock price. Thus this strategy is called a neutral option strategy.

**(g) Ratio Spreads**

These are an extension of bullish or bearish spreads. In a ratio spread a bullish or bearish spread is taken with an additional position.

Conventionally, the ratio is defined as the number of options written divided by the number of options bought. It is generally represented as 1 by 2. This means that 2 options are sold against 1 option bought. There is no limit to the ratio. Hence, Innumerable ratio spreads are possible. But for our discussion we will make use of the 1 by 2 spread.

Ratio spreads may be ratio call spread or ratio put spread.

**Ratio call spread:** Ratio call spread involves buying one call option and selling two call option at a higher strike price (selling double the number of ITM call, i.e., ratio of 2:1). So the long option is actually financed by the short positions in two options.

**Ratio put spread:** This involves buying the higher strike price put option and selling two lower strike price put options. This results in a net short position.

**Settlement of Option Contracts**

All option contracts must come to a close by any of the following three methods:

1. **By exercising:** To make profit, the holder of an option may decide to exercise the right. When the buyer or holder exercises the right, the seller honours the obligation. The seller (writer) has to deliver the asset under a call or pay the price for the asset under a put. In the case of American option, the exercise can be done at any time. But in the case of European option exercise can be done only on maturity or expiry.

2. **By letting option expire:** If it is not profitable to exercise the option, the buyer or holder of the option would not exercise the option. He would let it expire worthless. He will lose the premium paid. It is not necessary that the holder exercises the option whenever profitable opportunities arise during the life of an option. Even if the option is profitable, the holder may not exercise the right in the hope of making larger gains later. If the option holder does not exercise the option the obligations of the writer would cease automatically upon maturity of the contract.

3. **By offsetting:** Option contracts can be settled by offsetting. Offsetting is a method of reversing the original contract to exit the trade. If a person bought a call ( option buyer or holder), he has to sell or write the call with the same strike price and maturity. Now the contract is settled. Similarly, if a person sold a call, he has to buy a call with the same strike price and maturity. Now the contract is settled. An obligation to sell/buy stands nullified by a right to buy/sell. Similarly, if someone bought a put, he has to sell a put with the same strike price and maturity. If anyone has sold a put, he has to buy a put with the same strike price and maturity. Any option contracts that are not offset are deemed to be open.

Most options are not exercised, but are closed by holders by selling and writers by buying new contracts. This is offsetting.

**Exotic Options (Non-generic Options)**

A number of options have been emerged in recent years. Sometimes it is difficult to understand their structures. Many of these options have unusual features. That is why they are called exotic options. Some of the exotic options may be briefly explained as below:

1. **Asian Options :** In the Asian options, the pay-offs at expiry will be equal to the difference between the strike price and the average price of the underlying asset over the life of the options. These are also called *average options.*

2. **Barrier Options :** A barrier option will be activated / deactivated when a pre-specified price is reached. The pay-off a barrier option depends on whether the underlying assets's price reaches a certain level during the specified period of time. This means that in a barrier option, after deciding on the strike price, another price is identified and is agreed as barrier. If the stock price reaches that level the option holder will lose all the claims conferred on him by the option and at that moment the option will go dead. This type of barrier options is called knock-out option. The opposite of this is the knock-in option. Here the option comes to life only if the asset price reaches or touches the barrier level.

3. **Binary Options :** A binary option provides a fixed pay-off, depending on the fulfillment of some condition. For example, a binary put option may pay off ₹ 100 if the stock price at maturity is less than the exercise price. These are also known as digital options.

4. **Lookback Options :** The pay-off of a lookback option depends on the maximum or minimum price of the underlying asset during the life of the option. For example, the payoff of a lookback call option may be equal to the maximum stock price during the life of the option minus the exercise price.

5. **Shout Options :** This is an exotic option of European option nature under which the holder can shout to the writer at one time during its life. At the end of the life of the option the option holder receives either the usual pay off from an European option or the intrinsic value at the time of shout, whichever is greater.

**Options on Stock Indices (Stock Index Options)**

Stock index options are among the most widespread option markets in the world. Options on stock indices represent a very successful innovation in the history of organised options exchanges in the world.

**Meaning of Options on Stock Indices**

An option , call or put, on a stock index is very much like an option on stock and gives its holder (buyer) to right to buy or sell the index (indices) at a given exercise price. Thus, like any other option contracts, the buyer has the right and the seller has the obligation. The buyer of an index call option gets the right to participate in the market gains over and above the pre-determined exercise price until the expiration. Such an option provides an unlimited profit potential since the index can raise to any level. Similarly, an index put option buyer stands to gain, should the index level fall below the pre-determined exercise price. Depending on the extent of downturn in the index level, the put option buyers can make substantial profits.

Like options on stock, the stock index option may be in -the- money, at- the- money or out -of- the- money, depending on the relationship between the index value and the exercise

price. A call index option is in the money, if the index value is greater than the exercise price and out of the money if the index value is smaller than the exercise price. On the contrary, a put option is in- the- money when the spot (current) value of the index is lower than the exercise price. It is out -of -the- money when the value of the index is greater than the exercise price.

In the case of a call option, if the underlying index is higher than the exercise price, the buyer may exercise the option. This is profitable for the buyer. That is why he exercises the option. The break even point for the call buyer is equal to the exercise value of the index plus the premium paid. The greater the excess of index value at settlement over the break even point, higher the profit to him. In case the value of index at settlement is lower than the break-even point, the buyer loses a part or whole of the premium paid , depending on whether the index value is above or below the exercise price. Let us take an example. Suppose an investor purchases a call option contract with an exercise price of `1520 for ` 5(premium). The break even point for him would be ` 1525. At the settlement, if the index value in greater than ` 1525, the buyer makes a profit. If the index is below `` 1520, he loses his entire premium. If the index value is between ` 1520 and ` 1525, he loses part of this premium. Thus, if the index value is `1522, he loses ` 5-2 = ` 3. The maximum loss that the buyer can incur is equal to the premium paid.

In the same manner, we may determine the profit or loss profit of a put option buyer. A put option buyer gets gain if, at the time of exercise, the index is lower than his break even point. The break even point in turn is equal to the exercise price less the premium paid. Further, the buyer loses part or all his premium if the index value is greater than the break even point. When the index value is greater than the exercise price, then the option is out-of- the- money and is not profitable to exercise. In such a case, the buyer loses the entire premium.

**Features of Options on Stock Indices**

The main features of options on stock indices are as follows :

1. In case of stock index option, the underlying is stock indices like Sensex, S&P CNX Nifty etc.
2. The stock index options are very useful especially for the institutional investors. This is because they allow the investor to make investment decision on a specific industry, sector or on the market as a whole, rather than on a particular company or companies.
3. Stock index options are cash settled. This is because the underlying asset, i.e., stock indices are not physical. Hence they cannot be delivered.
4. There is uncertainty with option on stock indices of the amount that will be paid or received.
5. The stock index reflects the reported price movements in the securities underlying it. Thus a stock index would be expected to reflect the market as a whole to the extent that the securities included in the index are being promptly reported and changes made in the index value.

**Difference between Option on Stock and Option on Stock Indices**

There are three fundamental differences between the stock option and stock index option. They are :

1. The first is with regard to the delivery mechanism. In case of stock options, it gives the right to take delivery (upon cash payment in case of call option) or deliver (upon receipt of cash, in case of put option) a specified number of shares of the underlying security. But in case of stock index options, it is not practical to deliver shares for each component of the index. These options have to be necessarily cash-settled.

2. There is uncertainty with regard to the amount that will be paid (in case of call) or will be received (in case of put) in stock index option. An investor who decides to exercise a stock index option has to notify his broker before a certain cut-off time established by the broker. Further, the closing price on the expiration day determines the actual amount of money due or to be received on account of the option exercise. Since the cut - off time may fall well before determination of the closing price, it is not sure whether the exercised option will be in -the- money at that time. Thus the holder of a stock index option who exercises it before the closing index value for that day is known, runs the risk that the value of the index may subsequently change adversely. On the other hand, in case of stock option, there is no such uncertainty.

3. In case of stock options there are exposures to both systematic and unsystematic risks. On the contrary, stock index options have a very little unsystematic risks.

**Hedging with Stock Index Option**

Put options on stock index can be used to protect a diversified portfolio against an anticipated market downfall .The underlying principle is the same: if the market declines, the hedger hopes to make enough gains on options to offset the losses on his portfolio. To hedge his portfolio, the investor has to decide as to which and how many of options contracts to buy, because a number of options are available on an index. In principle, any of the options can be used for the purpose and the key to the number of contracts lies in delta.

The delta for a put option is negative. If an option has delta equal to 0.40 , for example, it has the implication that for the point decline in the stock index by ₹1, the value of the put increases by about 40 paise.

Number of option contracts to buy may be calculated below:

$$\frac{\text{Value of portfolio}}{\text{Contract value}} \times \text{Portfolio beta} \times \frac{1}{\text{Delta}}$$

Thus in the first step, we find the total value for which protection is needed. This total value can be found by multiplying the portfolio with its beta and dividing this product by

delta. The negative sign of delta may be ignored here. The number of contracts to buy can be known by dividing the value of one contract (equal to exercise price multiplied by market lot or multiplier to convert into monetary).

**Option Markets in India on NSE and BSE**

In India option trading is being done on NSE and BSE. The NSE introduced trading in Index Options (also based on Nifty) on June 4, 2001. NSE also became the first exchange to launch trading in options on individual securities from July 2, 2001. Futures on individual securities were introduced on November 9, 2001. Futures and Options on individual securities are available on 216 securities stipulated by SEBI.

Options can be allowed in the second phase. BSE is also planning to introduce other features that are available in DTSS on BOLT terminals later. Those brokers who want to trade in derivatives on BOLT would not have to bear any extra charges, but they will have to comply with requirements related to taking derivative membership, separate registration of clients for derivatives and other regulatory requirements.

**Equity Options in India**

There are two popular types of equity options : Index options and options on individual securities. Both the types of equity options have been introduced in India recently by the National Stock Exchange and the Bombay Stock Exchange.

**Index Options :** Index options are options on stock market indices. Currently the most popular index options in India is the option on the S & P CNX Nifty which is traded on the National Stock Exchange. The salient features of this option contract are as follows :

1. The contract size is 200 times (or multiples thereof) the underlying index, viz., S & P CNX Nifty.
2. It is a European style option contract.
3. The options contracts have a maximum of three month trading cycle-the near month (one), the next month (two), and the far month (three). A new contract will be introduced on the next trading day, following the expiry of near month contract.
4. The expiry day is the last Thursday of the expiry months or the previous trading day if the last Thursday is a trading holiday.
5. The contract is cash settled. The settlement is done a day after the expiry day based on the expiration price as may be decided by the exchange.

**Options on Individual Securities :** Options on individual securities have been introduced by the National Stock Exchange and the Bombay Stock Exchange. The features of such option contracts on the National Stock Exchange are as follows :

1. Option contracts on individual securities will have a maximum of three-month trading cycle. ON expiry of the near month contract, a new contract shall be introduced at new strike prices for both call and put options, on the trading day following the expiry of the near month contract.
2. The Exchange shall provide a minimum of five strike prices for every option type (i.e., call and put) during the trading month. There shall be two contracts in-the-money (ITM), two contracts out-of-the-money (OTM), and one contract at-the-money (ATM).
3. Option contracts on individual securities shall expire on the last Thursday of the expiry month. If the last Thursday is a trading holiday, the contract shall expire on the previous day.
4. The value of an option contract on individual securities shall not be less than ₹ 200,000 at the time of introduction. The permitted lot size for the option contracts on individual securities shall be in multiples of 100 and fractions, if any, shall be rounded off to the next higher multiple of 100.
5. The price steps in respect of all option contracts admitted to dealings in the Exchange shall be ₹ 0.05
6. Base price of the options contracts on introduction of new contracts shall be the theoretical value of the options contract arrived at using the Black-Scholes model. The base price of the contracts on subsequent trading days will be the daily close price of the option contracts.
7. Options on individuals securities are American style. In American style option contracts, the exercise type is automatic on the expiration day, and the exercise type of voluntary prior to the expiration date of the option contract. Automatic exercise means that all in-the-money options would be exercised by NSCCCL (the clearing corporation) on the expiration day of the contract. The buyer of such options need not give an exercise notice in such cases. Voluntary exercise means that the buyer of an in-the-money option is required to direct his broker to give exercise instructions to NSCCL.
8. Settlement of exercises of options on securities will be by payment in cash and not by delivery of securities, at least initially, in accordance with SEBI guidelines. The settlement is on T + 3 day.

## PRACTICAL PROBLEMS

**Illustration 1**

An investor writes a call option on one share of Sun Ltd. at a strike price of ₹160 at a premium of ₹6 per share. The maturity date is three months and buys a share of same in the spot market at ₹158 per share. Prepare payoff table and graph.