

# DERIVATIVE MARKET



## LEARNING OUTCOMES

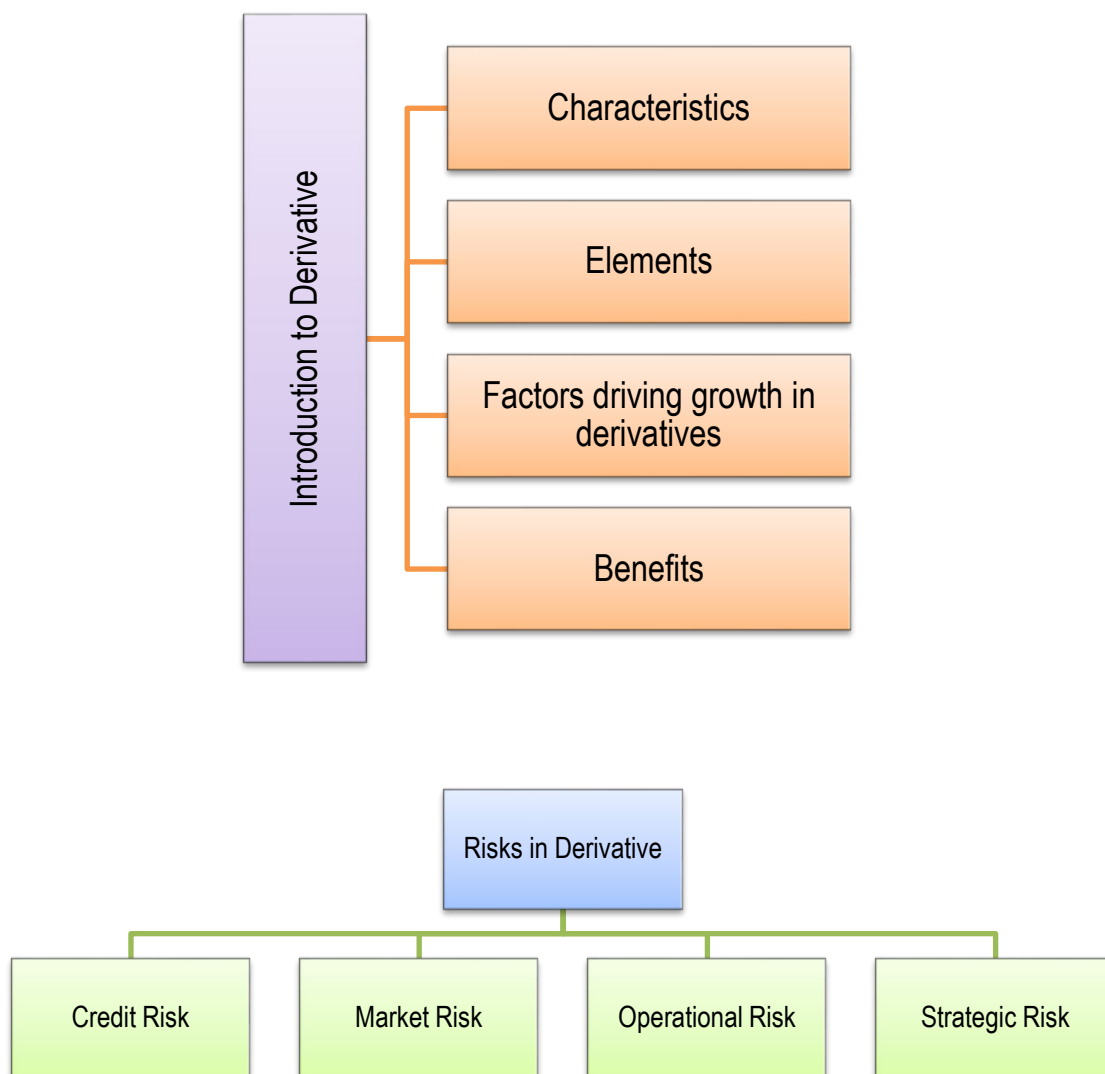
**By the end of this chapter, students shall be able to understand:**

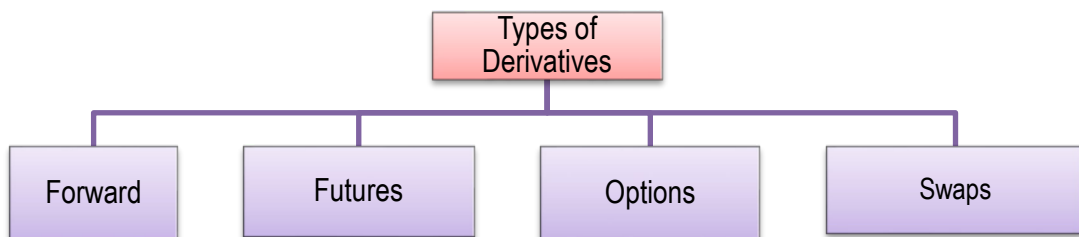
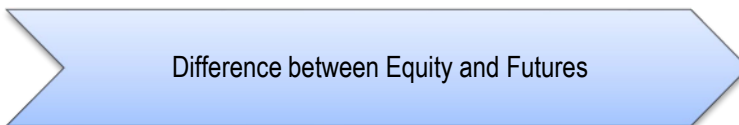
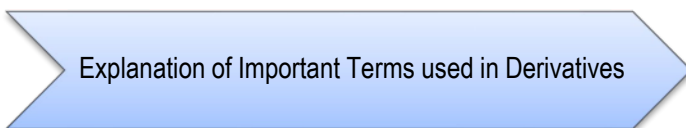
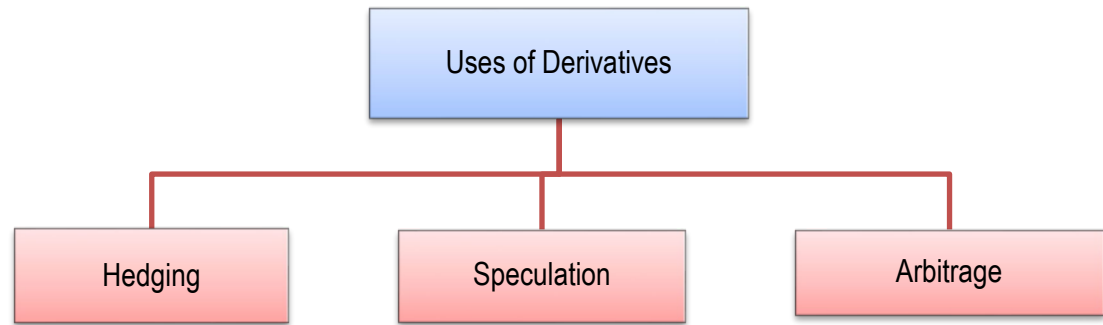
- ☐ Introduction to Derivatives
- ☐ Explanation of important terms used In Derivatives
- ☐ Difference between Forward and Futures
- ☐ Difference between Equity and Futures contracts
- ☐ Types of Derivatives
  - Forwards
  - Futures
  - Options
  - Swaps

## CHAPTER OVERVIEW



## Derivative Market

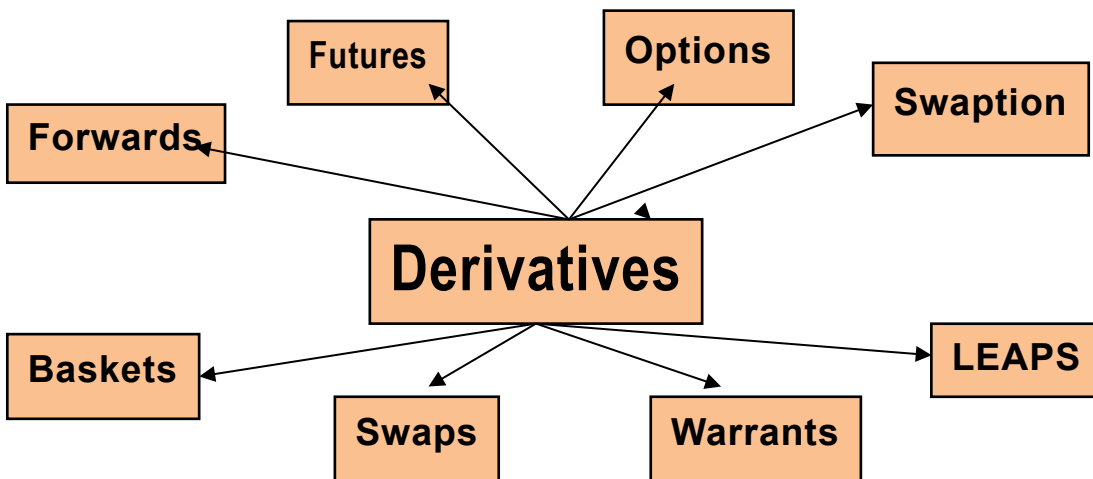






## 1. INTRODUCTION

A derivative is an instrument which derives its value from an underlying instrument. The underlying instrument can be anything be it any asset, index, commodity, interest rate bond, debenture etc. An important thing to understand here is that the price of the derivative is decided by the movement/happening/value of some other instrument which is called “underlying”.



### 1.1 Characteristics of Derivatives:

- It is a contract which derives its value from an underlying asset i.e., their value depends on the movement in the prices of their underlying.
- It is a price discovery mechanism. Prices of derivative instruments such as futures and forwards can be used to determine what the market expects future spot prices to be.
- It is a vehicle for transferring risk.
- It is used as a hedging instrument.
- It is a mechanism for speculation and arbitrage.
- It is a leveraged Instrument which increases its potential risks and rewards.
- Settlement of obligations takes place at a future date (expiry date/maturity period).
- It can be cash / delivery settled, depending upon the derivative – forward or future.

### 1.2 Elements of Derivatives contract

- A legally binding contract

- There are two parties: buyer & seller
- There is an underlying asset
- The contract is to be executed at a future date
- Future price (decided at the time of contract)
- Transfer of risk

### 1.3 Factors which drive growth in derivatives:

- High volatility of assets prices in financial markets
- Increased integration of national markets with international markets
- Increased advancement in communication facilities
- Development of more sophisticated risk management tools
- Innovations in the derivative markets

### 1.4 Benefits of Derivatives:

- Price Risk Management – buying, selling of risk.
- Price Discovery
- High Financial Leverage
- Beneficial to Banks & Financial Institutions
- Lower Transaction Cost
- Operational advantages
- Market efficiency
- Ease of speculation

### 1.5 Risks in Derivatives:

Derivatives, being leveraged instruments, have risks like counterparty risk (default by counterparty), price risk (loss on position because of price move), liquidity risk (inability to exit from a position), legal or regulatory risk (enforceability of contracts), operational risk (fraud, inadequate documentation, improper execution, etc.) and may not be an apt instrument for a person with limited resources, limited trading experience and low risk appetite. One should carefully read the Model Risk Disclosure Document, given by the broker to his clients at the time of signing the agreement. The Model Risk Disclosure Document is

issued by the members of Exchanges and contains important information on trading in Equities and F&O Segments of exchanges. Some other risks associated with Derivatives are:

- Credit risk (only OTC contracts)
- Market risk
- Operational risk
  - Settlement risk
  - Legal risk
  - Risk of error
- Strategic risk

## 1.6 Uses of Derivatives:

### 1. Hedging

Hedging is a tool to minimize risk. Risk means adverse deviation from the expectations which can occur due to “N” numbers of factors. Normally it is done to reduce the price risk, therefore hedging is taking a position in an instrument to protect against adverse price movement of another asset class. Normally, a hedge consists of taking the opposite position in a related security or in a derivative security based on the asset to be hedged.

For example, If you have long position in Reliance @ 2350 (Qty 250) and you are worried that the price may come down due to an upcoming event say election results, important AGM of company, big policy announcement by the company, important RBI policy or any other event which may have adverse impact on the market and specially on Reliance. Now, you would like to protect yourself and would like to buy some protection with a wish that if price goes up you enjoy the up move and if price comes down that protection protects you from the fall in price. Taking that protection in the shape of buying “PUT” of Reliance is known as Hedging i.e. protection against unexpected future risk of unfavorable movement.

### 2. Speculation:

Speculation is a transaction which is settled without delivery. Speculation is buying and selling of any assets with a view to making profits through the price movement of the asset class without the intention of taking delivery of the same. Thus, intraday transactions are speculative transactions, because they are settled without delivery

i.e. only the difference in amounts are settled. For understanding only the intraday transactions of SPOT markets are known as speculative transactions.

### 3. Arbitrage

Arbitrage is the simultaneous purchase and sale of the same or similar asset in different markets or instruments to profit from difference in prices. It tries to capture price variations in identical instruments in different exchanges or similar financial instruments in different markets or in different forms. It can be possible in any asset class. Normally computer programs known as Algo's are used to exploit the price differences or inefficiencies wherever they exist.

**Example: 1** If price of a Stock in National Stock Exchange (NSE) is at 101 and at the same time price of the same stock in Bombay Stock Exchange (BSE) is say 102, now, if one buys the stock in NSE and sells at BSE at the same time to lock the profit of ₹ 1 per share is known as arbitrage. The benefit of arbitrage is that the person doing it gets fixed (locked) profit and for the market as a whole the discrepancy of price evaporates because of more demand in NSE (i.e. the exchange where the price is low) and more supply in BSE (i.e. where the price is high).

**Example 2:** If the spot price of Axis Bank is ₹ 1019 and the price of Axis Bank current month future is trading at ₹ 1038, there is an arbitrage opportunity available if one buys spot of Axis Bank (Qty. equal to lot size of future) @ ₹ 1019 and simultaneously sells 1 lot of Future of Axis Bank @ ₹ 1038. Because on expiry both spot and future will be at one price (i.e. future expires at spot rate on the date and time of expiry), thus, profit of ₹ 19 per share is locked by the person doing arbitrage, if, he/she closes its both, spot and future positions on the date and time of expiry.



## 2. EXPLANATION OF IMPORTANT TERMS USED IN DERIVATIVES:

1. **Basis:** In the context of financial futures, basis is defined as the difference between the Spot price and Futures price. If the Futures price is higher than Spot price it is termed as Premium and if the Spot price is higher than the Futures price it is termed as Discount.
2. **Cost of carry:** The relationship between futures prices and spot prices can be summarized in terms of what is known as the cost of carry. This measures the storage cost plus the interest that is paid to finance the asset less the income earned on the asset. **For example**

Particulars	Spot	Future
Price	500	504
Today's date	Sept 08, 2023	-
Lot Size	-	1000
Expiry date	-	Sept 28, 2023

If risk free rate of interest prevailing in the market is @7% p.a. then, the interest amount on ₹ 5,00,000 (i.e. 500\*1000 lot size) for 21 days shall be  $(5,00,000 \times 7/100) \times 21/365 = ₹ 2014$  (approx.). Thus, the future shall trade with a premium of ₹ 4 (i.e. 2014/500). As the time approaches expiry, the premium will gradually come down and, on the date and time of expiry, the premium will become zero (i.e. the futures instrument will expire at spot price)

3. **Initial margin:** The amount that must be deposited at the time of entering a futures contract as security for the buy or sell position is known as the initial margin. It is refundable in nature.
4. **Spot price:** the price at which an asset trades in the spot market.
5. **Futures price:** the price at which the futures contract trades in the futures market.
6. **Contract cycle:** the period over which a contract trades.
7. **Expiry date:** this is the last day on which the contract will be traded, at the end of which it will cease to exist.
8. **Contract size:** the amount of assets that must be delivered under one contract. Also called as lot size.
9. **Mark to Market Margin:** It is calculated on a daily basis. The logic behind it is that both buy and sell position holder has same probability of risk for their positions say they entered a position to buy and sell an instrument at a price of ₹ 500 and Lot size 1000 with a 20% margin. They both will pay the margin of ₹ 1,00,000 (i.e., 20% of 500\*1000). Now, if at the end of the day the price closed at 490 then the buyer is at a loss of ₹ 10 per share i.e.,  $10 \times 1000 = ₹ 10,000$  total losses. Mark to Market is bringing all positions at the closing price of the day and give the loss if any and take away the profit if any. In this case, Exchanges want a margin of 20% @490 i.e., closing price. Thus, Exchange does two things:



- (a) Buyer shall bear the Loss of ₹ 10,000 and Seller will gain the profit of ₹ 10,000.
- (b) Exchange will pay back/release the margin collected earlier on ₹ 500 and now will calculate fresh margin @ 490 (closing price) and will collect the same i.e.,  $490 \times 1000 \times 20\% = 98,000$ . The details are as below:

Particulars	Buyer	Seller
Pay Loss	(10,000)	NA
Receive Profit	NA	10,000
Margin Release	1,00,000	1,00,000
Fresh Margin	(98,000)	(98,000)

All the positions are marked to market price. So, now the buy and sell positions are created at a closing price of 490. Therefore, if on next day the price closes at 494 then:

Particulars	Buyer	Seller
Pay Loss	NA	4,000 (4*1000)
Receive Profit	4,000 (4*1000)	NA
Margin Release	98,000	98,000
Fresh Margin	(98,800)	(98,800)

Now again the positions are brought at closing price i.e., ₹ 494. As if they have created the position at ₹ 494. Thus, in Mark to Market, the prices are marked to closing price and all the profits and losses are realized through transactions/entries in ledger account and margin is also calculated daily at latest closing price.

10. **Maintenance margin:** This is somewhat lower than the initial margin. This is set to ensure that the balance in the margin account never becomes negative. If the balance in the margin account falls below the maintenance margin, the investor receives a margin call and is expected to top up the margin account to the initial margin level before trading commences on the next day.



### 3. DIFFERENCE BETWEEN FORWARD AND FUTURES:

	Forward	Futures
Meaning	A customised agreement to buy or sell an asset at a future date.	Standardised agreement to buy or sell an asset at a future date through an exchange.
Trading Mechanism	Over the counter	Exchange Traded
Market Place	Traded on phone	Centralized exchange floor electronically networked.
Contract Size	Non-standardized, tailor made sizes	Standardized sizes decided by derivative exchange
Contract maturity / Payment date	Mutually decided by the parties to the contract	Fixed by derivatives exchange
Who can buy or Sell	Between 2 parties who know each other	Anyone, buyer & seller need not know each other
Regulation	Usually, self-regulatory	Regulated by derivatives exchange
Delivery & settlement date	On any day mutually decided by the parties	On the date fixed by the derivative exchange
Extent of Hedge	Being non-standardized and tailor-made contract, they provide exact hedge	Being standardized contract with specified lot size they are either over the hedge, under hedge or exact hedge.
Counter party	Buyer and seller	Clearing house of derivative exchange
Counter party risk	High	No Counterparty risk as exchange clearing house is the counter party
Liquidity	Illiquid. Not listed on exchange, so they are not tradable	Liquid. They are tradable since they are listed on exchange
Valuation	They are not traded, no standard valuation	Marked to market, since they are traded on daily basis

Margin requirement	No such requirement	Margin is required
Settlement method	Settled by actual delivery of underlying. Some are cancelled at cost.	Cash Settled or Physical Settlement by and through derivative exchange.



## 4. DIFFERENCE BETWEEN EQUITY AND FUTURES CONTRACTS

	Equity	Futures
Purpose	The main purpose of equities markets is to create capital.	Futures markets exist to facilitate risk shifting and price discovery.
Short positions	Short positions can only be taken on intraday Basis.	There is a short for every long position.
Margin	The buyer pays the full price for the purchase.	Involves paying different margins like initial + mark to market margins
Right to Vote in Company	Provide right to attend and vote in Meetings of the company	Does not provide any such right
Maturity	They are issued without a termination date	Have pre specified expiry date
Circuits	Have circuits	Do not have circuits
Ownership	Buyer becomes owner of the percent of shares bought	Does not provide ownership
Dividend	Right to receive Dividend	No such Right exists as no ownership right.



## 5. TYPES OF DERIVATIVES

### 5.1 Forward:

Forward contracts have been there for a long time but were not referred to by their name. They are present in every field of our life. **For example:**

1. When you go to book a new car, you negotiate and fix the price today & agree to take the delivery on some other day in future. It is a forward contract because irrespective of the price at future date you will buy at a predetermined rate.
2. You go to a Gold Smith and select the ornament design and ask him to make the same as per your size. Further, you decide the price of Gold today and agree to take delivery at some other day in future. It is a forward contract because irrespective of the price at the future date you will buy at a predetermined rate.

Now, what if on the date of delivery of the Car and Gold as mentioned above the price increased drastically? You will insist that the price was decided in advance on the date of the contract and will make sure that the item is delivered to you at the agreed price, because it is your right to receive the same at the agreed price. This is what is called Forward contract.

3. **Another example** is that you have bought a Plant and machinery from USA at ₹ 1,00,000 USD and the billing is in USD. The current rate of USD/INR is 82 (i.e., 82 Rupees per US Dollar). You agree to make the payment in 3 months from now. This is a Forward contract. Now, you are worried about the rise in USD in those 3 months, because in that scenario you will end up paying higher INR. So, you want to lock the price of USD you ultimately pay, so that, you sleep happily, and any adverse movement of USD will not affect you.

For this, you decide to go to a Bank doing forward transactions and enter into an agreement to buy USD 1,00,000 after 3 months from now at USD/INR 82. (**This is called hedging**). After 3 months if the USD/INR rate is say 85 then you would not be affected as you are making ₹ 3 per Dollar in forward transaction from Bank.

**Now, there are two options before you:**

- (a) Either buy USD from Bank at ₹ 82 per US Dollar and pay to the Vendor.
- (b) Or agree to get the difference from the Bank i.e., ₹ 3 per US Dollar i.e., ₹ 3,00,000 from Bank and bring your 82,00,000 you agreed to while purchasing Plant & machinery and go and buy USD 1,00,000 from Market at current price i.e., 85 per US Dollar and pay to the Vendor.

**If the USD/INR rate fall to say 80. Now again you can:**

- (a) Either buy USD from Bank at ₹ 82 per US Dollar and pay to the Vendor.
- (b) Or Pay ₹ 2 per US Dollar i.e., ₹ 2,00,000 to bank and go and buy USD 1,00,000 from Market which now will be available at ₹ 80 per US Dollar and pay to the Vendor. Here also the effective cost of USD/INR is 82 for you i.e., ₹ 2,00,000 plus ₹ 80,00,000.

Forwards are also known as “**OTC**” contracts i.e., **Over the Counter contracts**. A forward contract is a customized contract between two parties, where settlement takes place on a specific future date, but price is agreed today. In a forward contract, there is always a risk that any party may back out from the contract at any time.

Forwards are private contracts, and their terms are determined by the parties involved.

**For example:** Mr. A entered a contract with Mr. B to buy Gold at say ₹ 52000 per 10gm (Tola) after 3 months (here the price is decided now and the settlement shall be done after 3 months. But, if in between the price moves up or down then one person might think of backing out from the contract. Hence, these forward contracts have settlement risk.

### 5.1.1 Long and Short positions:

One who buys the asset is referred to as a ‘long’ investor and is said to have taken a ‘long position’.

One who sells the asset is referred to as a ‘short’ investor and is said to have taken a ‘short position’.

### 5.1.2 Physical settlement in forward contract

A forward contract is settled by the physical delivery of the underlying asset by a short seller investor (i.e., the seller) to the buy position holder/investor (i.e., the buyer) against the payment of pre agreed price. There is some transaction cost involved in the physical settlement. Futures and options contract are settled on the date of expiry as decided in advance on the date of contract. But forwards contracts can be settled early as per mutual consent between the parties.

### 5.1.3 Cash Settlement in forward contract:

- ◆ Cash settlement does not involve actual delivery or receipt.
- ◆ Each party pays (receives) cash equal to the net loss (profit) arising out of their respective position in the contract.

#### In Cash settlement if:

- (a) Spot Price (SP) on the date of expiry of contract > Forward Price (FP) agreed in advance at the time of the contract then person with short position shall pay to the buyer who has taken a long position.
- (b) Spot Price (SP) < Forward Price (FP) then person with long position shall pay to the seller.
- (c) Spot Price (SP) = Forward Price (FP), then there is no obligation to pay any anything.

**Note:** Profit and loss position in case of physical settlement and cash settlement is the same except for the additional transaction costs which are there in the physical settlement.

### 5.1.4 Pitfalls of “OTC” contracts:

- ◆ Forward contracts are subject to default risk i.e., not honouring the contract by any of the parties.
- ◆ The risk of incurring losses due to any of the parties defaulting is known as counter party risk.
- ◆ Illiquidity because it is not traded on any exchange.
- ◆ No centralized trading.
- ◆ Absence of any middleman between the parties, who could have ensured that the contract is honoured.

## 5.2 Futures:

Any forward contract which is traded on the recognized exchange is known as a Futures contract.

In futures contract, the Exchange act as counterparty and it guarantees the settlement of trades done on its platform and for that it collects the initial margin from the parties involved in the contract and charge the Mark to Market margin on daily basis to ensure that both the parties always have equal margin available against their positions. It is because the risk of different prices in future is similar for both the parties i.e. (buyer and seller)

In Indian equity markets, the expiry date of the futures contract is last Thursday of every month and for Index i.e., Nifty and Bank Nifty the expiry is on weekly basis i.e., every Thursday in a month. Thus, the last Thursday of every month is monthly expiry of all derivatives contract as well as weekly expiry of Nifty and Bank Nifty contract too. However, now the weekly expiry of Bank Nifty is Wednesday. At any point of time, 3 months futures contracts trade simultaneously. For Example, if we are in January 2023, then 3 monthly contracts shall be:

January 2023 Contract	Near Month
February 2023 Contract	Next Month
March 2023 Contract	Far Month

Nifty Spot Price 17992.15 Date 05/01/2023			
INSTRUMENT TYPE	SYMBOL	EXPIRY DATE	LAST
Index Futures	NIFTY	25-Jan-23	18,070.05
Index Futures	NIFTY	23-Feb-23	18,135.00
Index Futures	NIFTY	29-Mar-23	18,209.00

Thus, **Futures contract is a contract which is:**

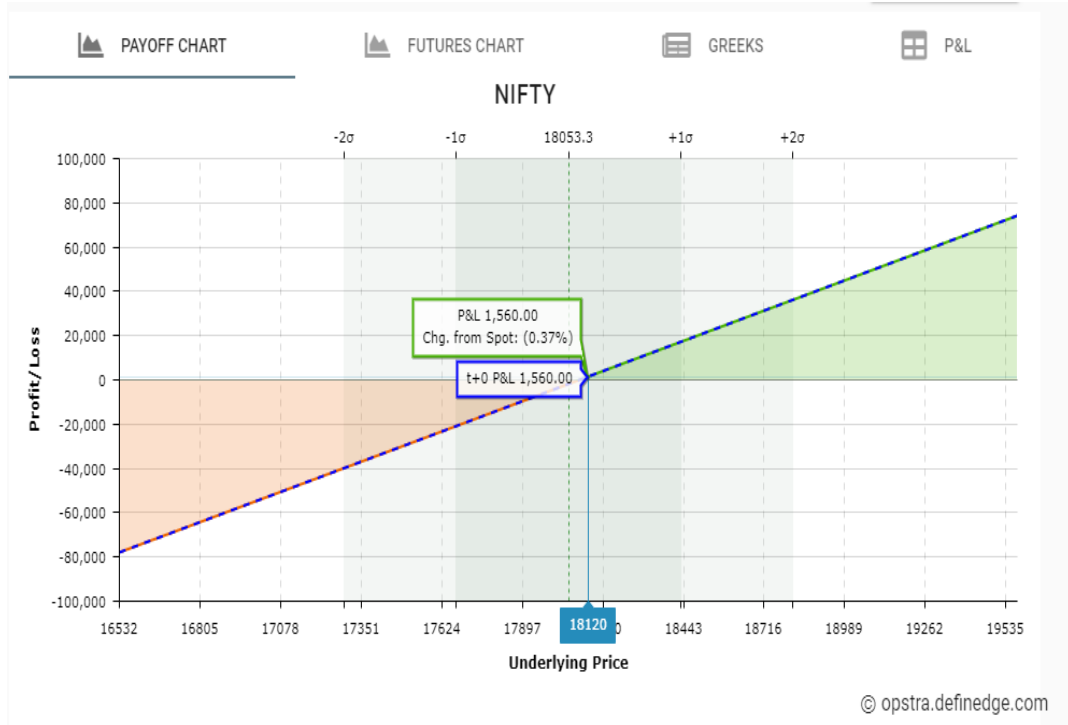
- (a) Traded on the recognized exchange.
- (b) Can be for buy or sell positions.
- (c) Standardized contract (like lot Size, Expiry date and other rules and regulations are decided by the exchanges)
- (d) Predefined expiry date for settlement
- (e) For a price decided today.
- (f) The counter party is Derivatives exchange.

**Features of Futures Contract:**

- ◆ Highly standardised –
  - Predefined underlying asset
  - Predefined Fixed expiry
  - Predefined Fixed lot size
- ◆ Payment of Initial Margin
- ◆ Daily Settlement mechanism – Mark to Market
- ◆ Final Settlement mechanism on the date of expiry
- ◆ Hedging of price risk
- ◆ Unlimited Profit and Loss potential
- ◆ Traded on Secondary Market
- ◆ Used for hedging
- ◆ Used for speculation
- ◆ Used for arbitrage

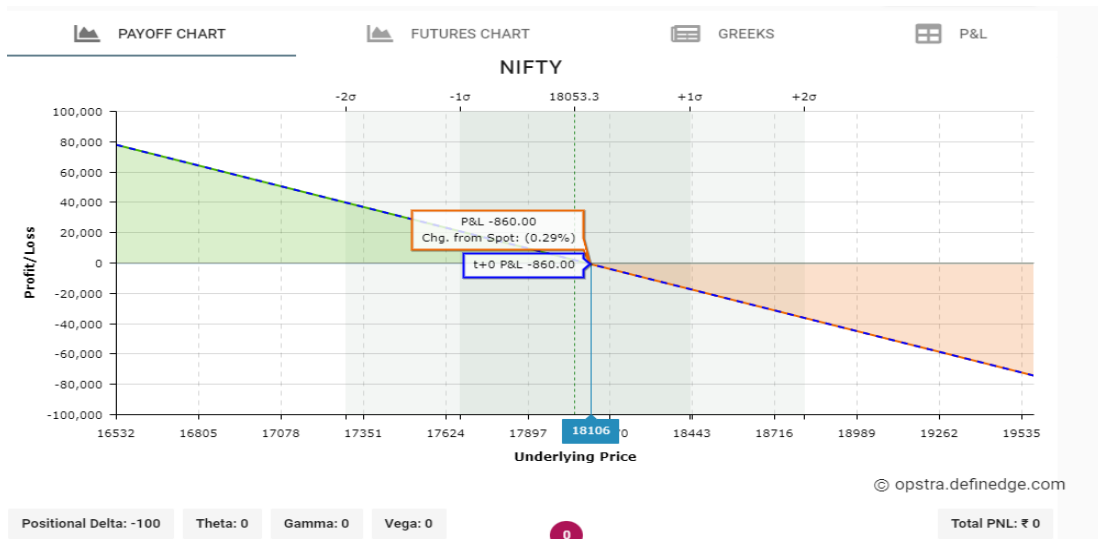
### 5.2.1 Long Future Payoff Chart:

If you have bought Futures Contract of Nifty lot Size 50 on Jan 17, 2023, at ₹ 18,088.80 and the Nifty goes up to 18120 then the profit shall be  $18120 - 18088.80 = 31.2 \times 50 = ₹ 1560$ .



### 5.2.2 Short Futures Payoff Chart:

The below is Short Futures scenario, When Nifty spot is at 18053, and you have shorted Futures Contract of Nifty lot Size 50 on Jan 17, 2023, at ₹ 18,088.80 and the Nifty goes up to 18106 then there is a loss of ₹ 860 i.e.,  $18088.80 - 18106 = 17.2 \times 50 = 860$ .

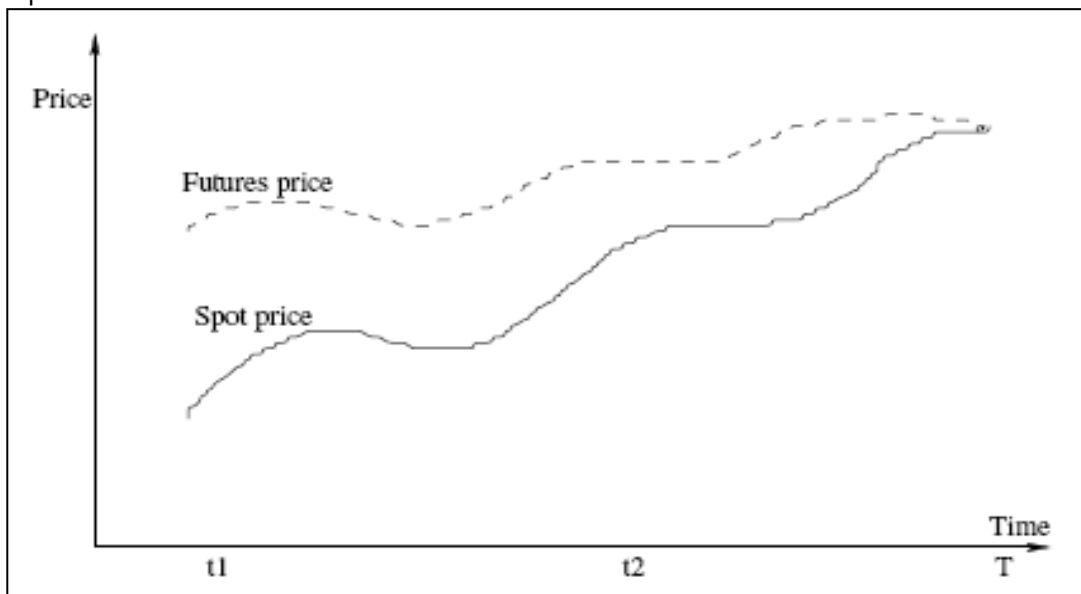




### 5.2.3 Contango

**Contango** means seedha badla. It happens in normal conditions when future prices are greater than spot prices. Usually, the future prices are greater than spot prices as futures trades at Premium (as it contains interest cost, storage cost minus any income by way of dividend).

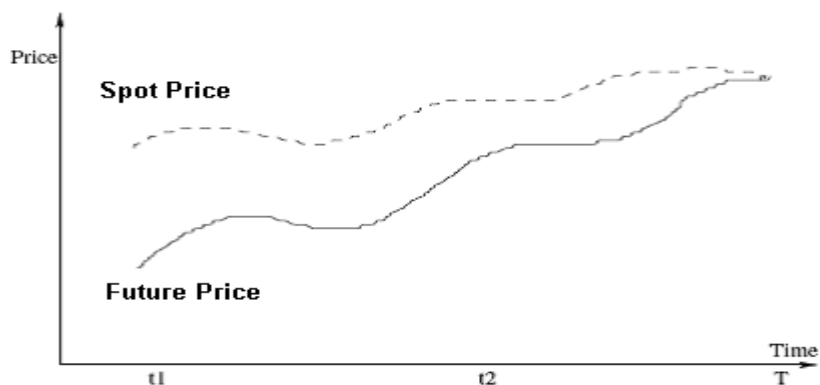
At the time of expiration, the future prices and spot price converge slowly and become equal.



### 5.2.4 Backwardation

**Backwardation** means Ulta Badla. It happens when future prices are lower than spot prices.

At the time of expiration, the future prices and spot price converge slowly and become equal.



### 5.2.5 Further explanation of the concepts learned

- ◆ When you want to lock your price and get yourself immune from future price movement of the underlying, you call it Hedging. So, when we say the price movement of the underlying then, does it mean that you have locked your price in some other instrument? The Answer is Yes. You have used some other instrument to protect you. But that instrument is such which moves/behaves/derives its value from the movement of the underlying. Thus, that instrument will make sure that you stay protected.

To further explain it you might assume that Derivative is taking a position in say mirror image of the underlying to make sure that the movement of underlying can be fully obtained.

**Example:** When you want to have a long position in some stock or index then the choices available to you are:

- (a) Buy that Share i.e., Buy Spot (But the point is that if you buy the spot then you must take delivery of the same as per the settlement process within a few days. i.e., in Indian equity Markets as on January 01, 2023, it is T+2 delivery settlement, thus pay the money with 2 days and take the delivery of the stock. From Jan. 2023, the settlement cycle has changed to T+1.
- (b) If due to any reason you do not want to take the delivery of the stock immediately and you still want to take long position exposure in the stock, then can you, do it? The answer is yes. Buy any such instrument which moves or derives its value from the underlying asset. Now the instrument you are taking an exposure is called Derivatives. Here you can buy forward Contract, futures contract, options contract.
- (c) If you want to take only one leg position i.e., say only buy position in an instrument, say future then it means that you have taken a naked long position and if the price of the underlying comes down your instrument will also come down and you will incur loss.
- (d) If you have taken 2 leg positions, the 2nd being reverse position from the first one, then it is called hedging. Say you already hold a long position in spot (say, purchased shares in the stock market) and you are worried that the price of spot will come down (first leg) and now you take a reverse position by selling the futures contract then it is called hedging. Because if the price goes up, the spot will give you profit, and future will give loss offsetting each other and vice versa.

**Note:** The extent of offsetting shows how much hedging you have done. If the offsetting of loss is 100% then it is called fully hedged and so on and so forth.

- (e) Now, since the instrument possesses such type of characteristics, people started using the instrument for speculation purposes by taking only one leg of the position. Based on their view they enter the derivatives contract with the idea to make money out of it.
- (f) Similarly, if, you want to take conditional exposure that if the situation is profitable i.e., the movement of underlying is profitable to you then you will use the option/choice to take the decision and take benefit and if the movement of underlying is not favorable to you then you will not be liable to pay anything. This type of product is known as upto options (explained later in this chapter).

### 5.3 Options

Imagine a scenario that you enter such a kind of contract that if the outcome is favorable for you then you will come out and exercise your rights and if the outcome is not favorable for you nobody will come to find you.

Sounds Good!!! **Let's take an example.**

If a promoter of a company enters a contract with the company to buy more shares of the company at say ₹ 50 per share after 5 years and pays ₹ 6 per share upfront as token/advance money for the contract. The current market price of the shares is, say, ₹ 65.

If after 5 years the current market price of the share of the company is ₹ 350 then the promoter will come out and pay the balance ₹ 44 and buy the shares and enforce the company to issue shares to him. But if the price of the share of the company after 5 years is say ₹ 40 then promoter will not come out and will not be under obligation to buy shares of the company. The name given to the instrument is Call option i.e., right to buy but not the obligation to buy.

An Option is a contract that gives the right to the buyer, but not an obligation, to buy or sell the underlying asset on or before expiry day, at a predefined price. The person buying the option i.e., taking a long position is called buyer/ holder of the option and the person selling the option i.e., taking a short position is called the seller/ writer of the option.

Further, when we say right to buy/sell but not the obligation then we are talking from the buyer's perspective.

Therefore, **to elaborate further -**

- (a) The view of buyer and seller is opposite.
- (b) When we talk about the buyer's perspective then the view of the seller is not taken into consideration.

- (c) Option buyer has right but no obligation as discussed in the above example. So, the buyer has the right to come out and exercise his right.
- (d) Option seller (writer) has only obligation but no right as explained in the above example. The company i.e., seller of contract has only obligation in the sense that if the buyer comes out to exercise his right, the company is under obligation to sell it.

An important point to note is here is that the buyer can exercise the right only on the day of the expiry of the contract and not any time before the expiry.

Therefore, in view of the above, the option buyer/ holder will exercise his option only when the situation is favorable to him, but, when he decides to exercise, option writer i.e., seller would be legally bound to honour the contract.

Furthermore, there are two parties to the option contract – option buyer and option seller.

- ◆ **Buyer of an option:** The buyer of an option is the person who gets the right but not the obligation in the contract. For getting this right, a price called “Premium” must be paid to the seller of the option. A buyer can be a Buyer of Call option or a Buyer of Put Option. Furthermore, maximum profit of the buyer of the option can be unlimited but the loss is limited to the extent of the premium paid.
- ◆ **Seller (Writer) of an option:** The writer of an option is the person who has the obligation but not the right. Writer (Seller) of the option receives the premium and is therefore obliged to sell/buy the asset, if, the buyer of option exercises his right. The maximum profit of the seller/writer of the option is limited to the extent of the premium received but the loss can be unlimited.

### 5.3.1 Difference between Buyer and Seller of the option:

Basis of Difference	Buyer of the Option	Seller/ Writer of the Option
Right	Buyer of the option has the right to buy/sell the underlying asset.	Seller of the option does not have any such right.
Obligation	Buyer of the option does not have any obligation.	Seller of the option has obligation to buy/sell the underlying asset if the buyer exercises his right.
Premium	Buyer of the option pays the premium.	Seller of the option receives the premium.

Maximum profit	Profit of the buyer of the option can be unlimited.	Profit of the seller of the option is limited to the extent of the premium paid.
Maximum Loss	Loss of the buyer is limited to the extent of the premium paid.	Loss of the seller of the option can be unlimited.

### 5.3.2 Explanation of some important terms used in options:

1. **Stock option:** These are the options in which the underlying asset is individual stocks, For example, options on Reliance, HDFC Bank etc.
2. **Index option:** These are the options in which the underlying asset is index. For example, options on Nifty, Sensex, etc. In India, the indexes like Nifty and Bank Nifty's options have both monthly and weekly expiry.
3. **American option:** The owner of such option can exercise his right at any time on or before the expiry date/day of the contract.
4. **European option:** The owner of such option can exercise his right only on the expiry date/day of the contract. In India, Index options are European.
5. **Option price/Premium:** It is the price which the option buyer pays to the option seller. For example, in the case of Nifty, the option price for call option is ₹ 221.20 and for put option, it is ₹ 88.75. These premiums are for single unit of Nifty and to arrive at the total premium in a contract, we need to multiply this premium with the lot size.
6. **Lot size:** Lot size is the number of units of underlying assets in a contract, say, in case of shares, the number of shares one must buy to enter into a futures contract. Lot size of Nifty option contracts is 50. Accordingly, total premium for all call options of a contract would be ₹ 221.20\*50= 11060 and total premium for put option of a contract would be ₹ 88.75\*50 = 4437.5.
7. **Expiration Day:** The day on which a derivative contract ceases to exist. It is the last trading date/day of the contract.
8. **Spot Market :** It is the market where any instrument trades and buyer buys and takes delivery and seller sells and give delivery of the share/instrument/commodity etc. as per the normal market parlance/process. We can also call it “mandi” where commodities or instrument trades.

**Example** Gold futures trades in derivatives (F&O) market. Now, the question arises what is spot market of Gold and how it relates Gold Future. Physical gold trading in any market in any city is spot market and spot price of one city may vary from the spot

price of any other city. Thus, for F&O one city has to be marked and treated as underlying of gold future. In India, Ahmedabad spot market is treated as underlying i.e. spot for gold futures.

Similarly stocks trading in NSE and BSE are treated as spot for their respective futures and options in the respective exchanges.

9. **Spot price (S):** It is the price at which the underlying asset trades in the spot market, it is the value of the underlying instrument. The spot market is where financial instruments, such as commodities, currencies, and securities, are traded for immediate delivery. Delivery is the exchange of cash for a financial instrument. A futures contract, on the other hand, is based on the delivery of the underlying asset at a future date.
10. **Strike price or Exercise price (X):** Strike price is the price at which the underlying security can be purchased or sold by the option holder, or it is the price at which the two parties (the buyer and the seller) agree to enter into an options agreement.
11. **In the money (ITM) option:** This option would give the holder a positive cash flow if it were exercised immediately. A call option is said to be ITM when spot price is higher than strike price. And a put option is said to be ITM when spot price is lower than strike price.
12. **At the money (ATM) option:** At the money option would lead to zero cash flow if it were exercised immediately. Therefore, for both call and put ATM options, strike price is equal to spot price.
13. **Out of the money (OTM) option:** Out of the money option is one with a strike price worse than the spot price for the holder of the option. In other words, this option would give the holder a negative cash flow if it were exercised immediately. A call option is said to be OTM, when spot price is lower than strike price. And a put option is said to be OTM when spot price is higher than strike price.
14. **Intrinsic value:** Option premium, defined above, consists of two components - intrinsic value and time value. In case of an option, intrinsic value refers to the amount by which option is in the money i.e., the amount an option buyer will realize, without adjusting for premium paid, if he exercises the option instantly.

Therefore, only in-the-money options have intrinsic value whereas at-the-money and out-of-the-money options have zero intrinsic value. The intrinsic value of an option can never be negative. Thus, for call option which is in-the-money, intrinsic value is the excess of spot price (S) over the exercise (strike) price (X), Similarly, for put option

which is in-the-money, intrinsic value is the excess of strike price (X) over the spot price (S).

15. **Time value:** It is the difference between premium and intrinsic value, if any, of an option.
16. **Open Interest:** Open interest is the total number of option contracts outstanding for an underlying asset.
17. **Exercise of Options:** In case of American option, buyers can exercise their option any time before the maturity of contract. All these options are exercised with respect to the settlement value/ closing price of the stock on the day of exercise of option.
18. **Assignment of Options:** Assignment of options means the allocation of exercised options to one or more option sellers. The issue of assignment of options arises only in case of American options because a buyer can exercise his options at any point of time.

### Example

Let us understand the above terms with the help of the following example in which the different terms are used in the options market:

Trade Information: Quote for **Nifty 17900 Call option** as on January 06, 2023:

- |     |                               |             |
|-----|-------------------------------|-------------|
| 1.  | Instrument type: Option Index |             |
| 2.  | Underlying asset: Nifty       |             |
| 3.  | Expiry date: January 12, 2023 |             |
| 4.  | Option type: Call European    |             |
| 5.  | Strike Price:                 | 17900       |
| 6.  | Open price:                   | 196         |
| 7.  | High price:                   | 226         |
| 8.  | Low price:                    | 80.75       |
| 9.  | Close price:                  | 102.75      |
| 10. | Underlying value:             | 17859.45    |
| 11. | Traded Volume (Contracts)     | 19,75,975   |
| 12. | Traded Value (₹ Lakhs)        | 1,16,137.93 |

13.	Traded Value - Notional (₹ Lakhs)	1,78,01,114.18
14.	Volume Weighted Average Price (VWAP)	117.55
15.	Market Lot	50
16.	Open Interest (Contracts)	96,398
17.	Change in Open Interest (Contracts)	83,366
18.	% Change in Open Interest	639.70

Trade Information: Quote for **Nifty 17900 Put option** as on January 06, 2023:

1.	Instrument Type: Option Index	
2.	Underlying asset: Nifty	
3.	Expiry date: January 12, 2023	
4.	Option type: Put European	
5.	Strike Price:	17900
6.	Open price:	72.05
7.	High price:	164.80
8.	Low price:	49.35
9.	Close price:	115.65
10.	Underlying value:	17859.45
11.	Traded Volume (Contracts)	29,70,031
12.	Traded Value (₹ Lakhs)	1,48,798.55
13.	Traded Value - Notional (₹ Lakhs)	2,67,30,576.00
14.	VWAP	100.20
15.	Market Lot	50
16.	Open Interest (Contracts)	66,773
17.	Change in Open Interest	30,153
18.	% Change in Open Interest	82.34

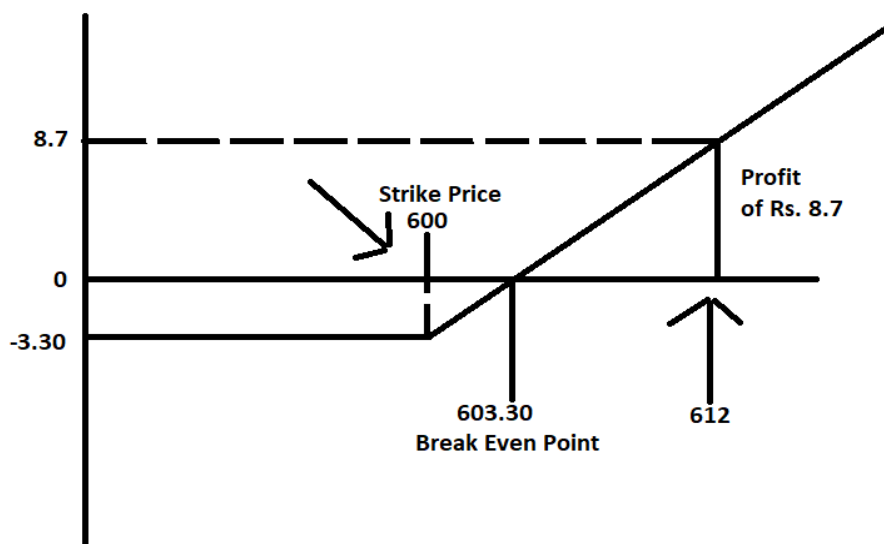


### 5.3.3. Types of Options

Options are generally of two types: -

#### 5.3.3.1 Call Options:

- (i) **Call option Buyer:** Buyer has a right to buy the underlying asset and the seller has the obligation to sell the underlying asset at predefined price. However, it is the wish of the buyer of call option whether to exercise his right or not. If he/she exercises the right, then the seller of the option shall be bound to sell the underlying asset at a predefined price i.e. strike price. Another thing to ponder upon here is that the buyer of the call option shall only exercise his right if he/she feels that it is better or profitable to exercise the option. The maximum loss of the buyer is restricted to the amount of premium paid. But, his profit is unlimited. Breakeven point of Call option buyer = strike price + premium amount.



The above picture shows the payoff graph of call option buyer

Stock Name	SBI
Expiry	Jan 25, 2023
Current Date	19/01/2023
CMP (Current Mkt Price of Spot)	589.70
Strike Price	600
Premium on 19/01/2023 At the time of taking buy position	₹ 3.30
Lot Size	1500

**Now the buyer has three possibilities i.e. price expires below 600, at 600 or above 600.**

**Case 1:** Expires below 600 then the call option will be worthless and become zero because the view of the buyer of the option that the price will expire above 600 proved wrong. Thus, he cannot force seller his right. Right can only be exercised once it accrues. Option premium will gradually reduce to zero as the time passes by and on the date and time of expiry it will be zero. This is also known as time decay.

**Case 2:** Expires at 600, the call option buyer's view was that the price will expire above 600. Thus in this case also the call option will be worthless and become zero. It will gradually reduce to zero as the time passes by and on the date and time of expiry becomes zero. This is also known as time decay.

**Case 3:** If the price expires above 600. Now, the view of Call option buyer is happening to be right. The more it goes above 600 the more beneficial it will be for buyer. Anything above 600 will belong to buyer and buyer will have the right to get that benefit. Consider the following charts:

Expiry Rate	Buyer will have the right to get	Profit
601	1*lot size	1-3.3= Loss of 2.3*lot size
603	3*lot size	3-3.3=Loss of 0.30*lot size
605	5*lot size	5-3.3 = Profit of 1.7*lot size
609	9*lot size	9-3.3= Profit of 5.7*lot size
618	18*lot size	18-3.3 = Profit of 14.7*lot size
655	55*lot size	55-3= Profit of 51.7*lot size
722	122*lot size	122-3.3= Profit of 118.7*lot size

**Buyer can exercise his right in two manners:**

**(a) Cash Settlement:** In the event of cash settlement, the buyer of the option does not get the delivery of the underlying asset but rather gets the cash amount i.e. money equal to his right.

By continuing the above example, in the case of cash settlement, the buyer will be entitled to get ₹ 1 i.e., if the underlying asset expires at 601 or anything above ₹ 600, that belongs to buyer of the option multiply with lot size. For instance, if lot size is 1500 then he will get ₹ 1500. Please note that if buyer is getting something due to his right then seller is under obligation to pay the same amount. Thus the right of buyer is automatically the obligation for the seller.

As far as the profit is concerned, in the above example the buyer has the right to get ₹ 1 per share i.e., ₹ 1500 but he has already paid ₹ 4950 (3.3\*1500) at the time of entering the contract as option premium. On expiry at 601 he will get ₹ 1500, so, effectively giving a loss of ₹ 4950-1500 = 3450.

However, what would be the scenario if the price had gone up to ₹ 603. Buyer would have the right to get ₹ 3 per share i.e.,  $3 \times 1500 = 4500$ , but already paid ₹ 4950 to enter the contract. So, again a loss of ₹ 450. Thus, the price of the stock of SBI must close at ₹ 603.30 to give the buyer the right to get ₹ 3.30 per share i.e.,  $3.30 \times 1500 = 4950$  the same amount which he paid at the time of entering the contract and thus reaches the breakeven level.

And now any close above ₹ 603.30 of SBI spot will bring the buyer in profit. i.e., if the prices close at 608 then he will be entitled to get ₹ 8 per share (Right to get ₹ 8 per share) i.e.,  $8 \times 1500 = ₹ 12,000$  and has paid ₹ 4950 ( $3.3 \times 1500$ ) premium at the time of entering the contract and thus making a profit of ₹ 7050 (i.e.,  $12000 - 4950$ ).

**Note:** Since what the buyer will get is dependent upon the price movement of the spot (underlying) of SBI that is why it is called the derivatives. An option itself cannot decide who will get what, but derives its value from the underlying instrument i.e., SBI Spot price.

SBI OPTION CHAIN DATA DATED 19/01/2023 CMP SBI 589.70														
CALLS								PUTS						
VOLUME	LTP	CHNG	BID QTY	BID	ASK	ASK QTY	STRIKE	BID QTY	BID	ASK	ASK QTY	CHNG	LTP	VOLUME
19	17.25	-4.4	1,500	17.2	17.95	1,500	575	3,000	1.55	1.75	1,500	-0.05	1.75	1,035
585	13.8	-2.5	1,500	13.55	13.9	1,500	580	1,500	2.65	2.75	1,500	-0.05	2.65	3,306
467	10.25	-2.25	1,500	9.65	10.3	3,000	585	1,500	4	4.25	1,500	0.15	4.05	1,629
4,570	7.25	-2.15	6,000	7.2	7.3	25,500	590	1,500	5.95	6.15	1,500	0.5	6.15	3,864
2,835	4.85	-1.95	6,000	4.8	4.95	30,000	595	3,000	8.65	9	3,000	0.6	8.6	592
6,575	3.3	-1.45	1,500	3.25	3.3	22,500	600	1,500	12	12.1	1,500	1.2	12.25	1,068
2,262	2.15	-1	4,500	2	2.15	1,500	605	3,000	15.7	16.35	1,500	1.1	15.8	82
3,913	1.35	-0.75	9,000	1.35	1.4	6,000	610	1,500	20.05	20.5	1,500	1.65	20	41
1,510	0.9	-0.5	6,000	0.9	0.95	9,000	615	1,500	24.5	25.5	1,500	0.9	24.1	18
12,171.00														15,446.00

As we can see from the diagram, there are different strike prices available, and each strike price is independent of the other. One can enter into an options agreement, at a specific strike price, by paying the required premium. For example, one can enter a call option at a strike price of ₹ 600 by paying a premium of ₹ 3.3 or strike price of ₹ 605 by paying a premium of ₹ 2.15

**(b) Physical Settlement:** The buyer of the call option shall have the right to buy the underlying asset/stock at strike price i.e. in other words at discounted price and the discount will be his benefit. This is also known as right of the buyer to get the underlying asset at predetermined price i.e. strike price. This automatically will become the obligation of seller to sell the underlying asset/stock at strike price, irrespective of current market price. Buyer will exercise his right if it is beneficial for him to do so.

In the above example, the buyer of the option will only exercise his right if SBI stock expires above 600. As the call option holder has the right to buy the share i.e., underlying at ₹ 600, the seller will be forced to sell the same at ₹ 600. Further, if the share expires at ₹ 601 and the buyer exercises his right then he will save ₹ 1. But don't forget that ₹ 3.30 already paid by him as premium while buying the Call option will lapse and even after exercising his right, he will still lose ₹ 2.3 i.e. (3.3-1). But if the share expires at 608 then he will save ₹ 8. And he will earn ₹ 4.7 i.e. (8-3.3).

(ii) **Call option Seller (Writer):** Seller of the options has the obligation and not the right to sell the underlying asset to the buyer at the predetermined price i.e., strike price. So, he has an obligation which he must fulfill if the future outcome is against him because in that case the buyer will exercise his right.

Again, by referring to the Figure in previous page, if, Mr. A would have sold the Call option at a Strike price of 605 at ₹ 2.15 premium and the price go up and expires at ₹ 620, then, he is under obligation to sell the shares (equal to lot size) of SBI @ ₹ 605 to the call option buyer in case of physical settlement. In the case of cash settlement, he must pay the difference i.e., closing price – strike price (620-605=15) i.e., ₹ 15 to the buyer of the call option obviously multiplied by lot size. Profit/loss of the call option seller is as follows:

= Premium – (Spot Price – Strike Price)

= 2.15 – (620 – 615)

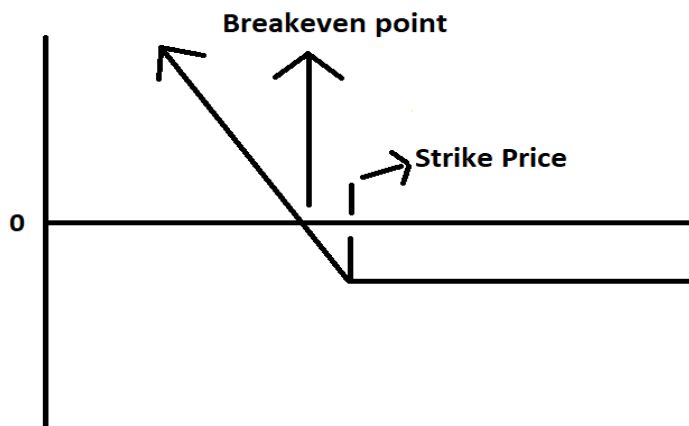
= 2.15 – 15 = - 12.85

### 5.3.3.2 Put Options

**Put option buyer:** Buyer has the right to sell the underlying asset and the seller of the put option has the obligation to buy the underlying asset at predefined price. Obviously, it is the wish of the buyer of put option whether to exercise his right or not. If he/she exercises the right, then the seller of the put option shall be bound to buy the underlying asset at a predefined price. Another thing to ponder upon here is that the buyer of the put option shall only exercise his right if he/she feels that it is better or profitable to exercise the option.

In the figure of SBI, in case of physical settlement, if Mr. Tarun buys a put option of strike price 590 @ ₹ 6.15 and the price comes down on the date of expiry to ₹ 570 then he will have the right to sell the shares to the seller of the put option @ ₹ 590, i.e., the strike price and the seller of the put option must buy the shares from Mr. Tarun. But, in the event of a cash settlement, the seller of the put option shall be under obligation to pay the difference between the strike price and expiry price i.e., ₹ 20 (590-570).

But if the price goes above 590 then the buyer of the put option shall not have any obligation to sell at a cheaper rate as the buyer of options has only the right but not the obligation.



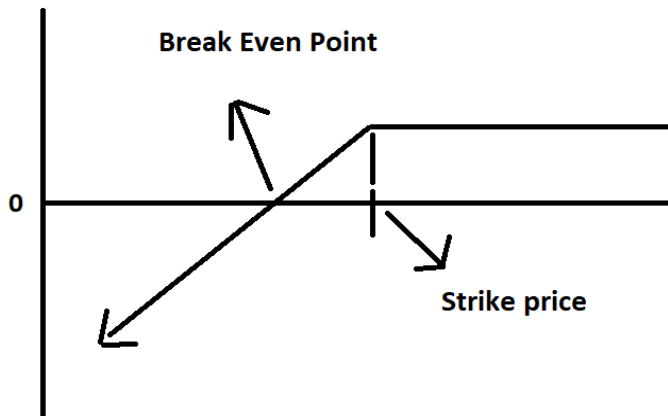
#### Put option Seller:

The seller of the options has the obligation to buy the underlying asset from the buyer at the predetermined price i.e., strike price. The seller does not have any right even if his view becomes right, but he has obligation if the future outcome is against him because in that case the buyer will exercise his right.

In the figure of SBI, in case of physical settlement, we have seen that the seller of the put option of strike price 590 @ ₹ 6.15 will be under obligation to buy the underlying shares of SBI equal to lot size from Mr. Tarun @ ₹ 590 if the share expires below 590 on the date of expiry.

The premium he has received from Mr. Tarun of ₹ 6.15 will remain with the seller and he is not required to pay it back. Note the premium received by seller belongs to him and is not to be paid back in any case.

But if the price expires above 590 say at 600 then what would have happened? The seller of the options does not have any right, he has only obligation, he cannot force buyer of the put option to sell the shares @ ₹ 590. Thus the premium he received will become his profit, as the buyer will not exercise his right because it will not be profitable for buyer of put option to exercise his right to sell the shares @ ₹ 590 when the market price is ₹ 600.



#### 5.3.4 Further explanation of the Concept of Intrinsic value and Time value:

The premium of the option consists of Intrinsic Value and time value. i.e.,  $\text{Premium} = \text{Intrinsic Value} + \text{Time Value}$ .

Now, what is Intrinsic Value? It is the value you are entitled to get as an option buyer if the share expires at CMP i.e., if you have bought a Call option at ₹ 19 of Strike price at ₹ 540 when the CMP of the stock is 555. Now, if the stock expires at CMP i.e., at ₹ 555 then as a call holder do you have any right to get anything?

The answer is yes, because the strike price of 540 call means that anything above 540 you have the right to get. Here, since the price has closed above 540 then you have the right to get ₹ 15 (555-540). This is called Intrinsic Value. Then what about the balance ₹ 4 you paid out of ₹ 19. This is time value.

**Note:** Time value is what the buyer pays for the fact the future outcome can be beneficial for him. In other words, the value he pays for buying uncertainty with a probability that the future outcome may be in his favour. In the above example when the price of the 540-strike price call option is ₹ 19 when the CMP is 555, if the price would have gone up then the call option buyer would have been more comfortable as his view is getting right.

For example, if the CMP rises to 560 then the intrinsic value of the option would have moved up. Who knows if the price would have gone up to ₹ 580 in such a scenario the intrinsic value would have been ₹ 40.




Thus, we can also say the time value is the value which the buyer of the option pays to buy the time, with the hope that the stock will move in his desired direction and the option will become In the Money and will have more and more intrinsic value. Because at the time of expiry the option buyer will only get intrinsic value, as the time value will vanish at the time of expiry.




**Further note that at Strike price intrinsic value is zero both for calls and puts.**

And the more the difference between the Strike price and CMP the more is intrinsic value. For calls Intrinsic Value is  $CMP - SP$ , and for Puts it is  $SP - CMP$  (SP is Strike Price)

And, also note that Intrinsic value cannot be negative i.e., either it is positive, or it is zero.



**Analysis for Intrinsic Value and Time Value for Calls: -**

In case of Calls	Intrinsic value	Time Value
Price Increases and goes above Strike Price	 <p>Intrinsic value will also go up for calls if the price goes more and more above the strike price. i.e., <math>CMP - \text{Strike Price}</math> is intrinsic Value.</p>	 <p>Time Value comes down with every passing day. As the time left to expiry is coming down it comes down.</p>
If the Price stays at strike price.  (Time value decrease with every passing day)	No Effect	 <p>Time Value comes down with every passing day. As the time left to expiry is coming down it comes down.</p>




<p>If the price goes down but still above Strike Price (For example coming down from 555 but still above 540 in above example)</p>	 <p>If the CMP is above Strike price, then Call will have intrinsic value and when the price comes down the Intrinsic Value also comes down.</p>	 <p>Time Value comes down with every passing day. As the time left to expiry is coming down it comes down.</p>
<p>If the price goes down and is below Strike Price (For Example coming down from 540 to say 538)</p>	<p>No Intrinsic Value in call option as the price is below 540 (Strike Price)</p>	<p>Time Value comes down with every passing day. As the time left to expiry is coming</p> 

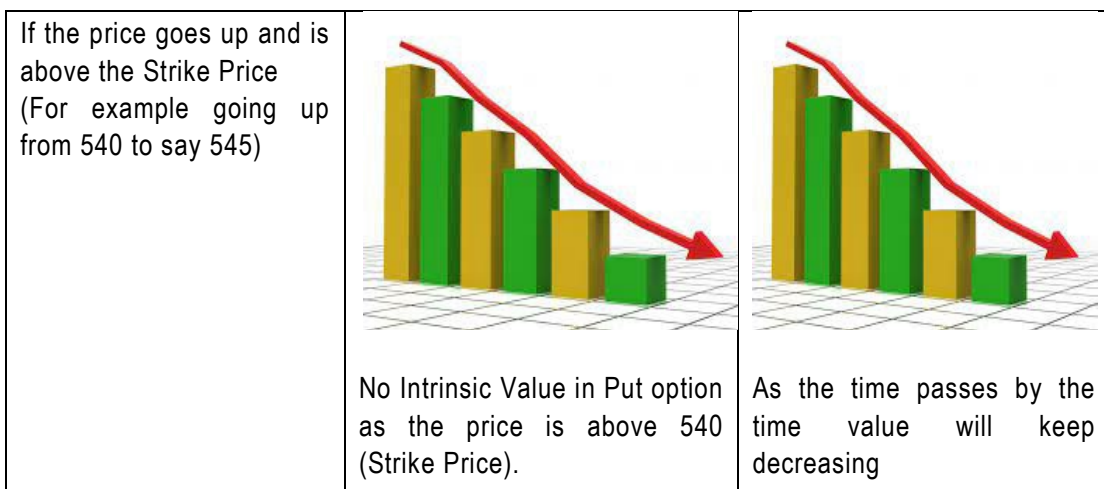
### In case of Puts:

Intrinsic value shall be there if price is below the Strike price.

In case of Puts	Intrinsic value	Time Value
<p>Price Increases and is still below Strike Price</p>	 <p>Intrinsic value will come down for Puts as the price is below</p>	 <p>Time Value comes down with every passing day. As the</p>



	<p>SP there is some Intrinsic value. But as soon as the price is approaching Strike price the Intrinsic Value will come down as the difference between SP and CMP is decreasing. i.e Strike Price - CMP is intrinsic Value</p>	<p>time left to expiry is coming down it comes down.</p>
<p>If the Price stays at Strike Price.</p> <p>(Time value decrease with every passing day)</p>	<p>No Effect</p>	 <p>Time Value comes down with every passing day. As the time left to expiry is coming down it comes down.</p>
<p>If the price goes down further below the Strike Price</p> <p>(For Example, coming down from 540 to 530 i.e., further below the strike price of 540 mentioned in above example)</p>	 <p>If the CMP is below the Strike price, then put will have more intrinsic value as the difference between SP and CMP is increasing more and more. <math>IV = SP - CMP</math></p>	 <p>Time Value comes down with every passing day. As the time left to expiry is coming down it comes down.</p>



The concept of Out of the Money (OTM), At the Money (ATM) and In the Money (ITM) has been further explained with the help of following chart:

Option Type	Underlying CMP	Strike Price	Option Price	OTM, ATM, ITM	Intrinsic value	Time Value
Call	652	640	18	ITM	12	6
Call	650	650	14	ATM	0	14
Call	651	650	14.5	ATM	1	13.5
Call	645	650	8	OTM	0	8
Put	687	680	8	OTM	0	8
Put	681	680	11.2	ATM	0	11.2
Put	679	680	12	ATM	1	11
Put	670	680	16	ITM	10	6

Furthermore ATM, OTM and ITM has been explained with the help of an example as follows:

In case of a call option, In the Money options takes place when strike price is below the CMP. For example, if the CMP price is at 510 then the strike price of 500, 490, 480, 470, 460, 450 are all in the money options because the price has already crossed these strike prices. You can also assume that when you talk about the call options you are looking up (technically it is buyers' perspective) On the other hand, where it is standing at par with CMP, it is ATM and those which have crossed CMP are OTM.

For Puts, ITM options are again the levels which are already crossed by the price. If CMP is 640 then 650, 660, 670, 680, 690, 700..... are all ITM puts. You may also assume that when you talk about puts options you are looking down (technically it is buyers' perspective). Now, the level at 640 strike

price shall be known as ATM and 630,620,610,600,590..... the levels which are still to come will be known as OTM Puts.

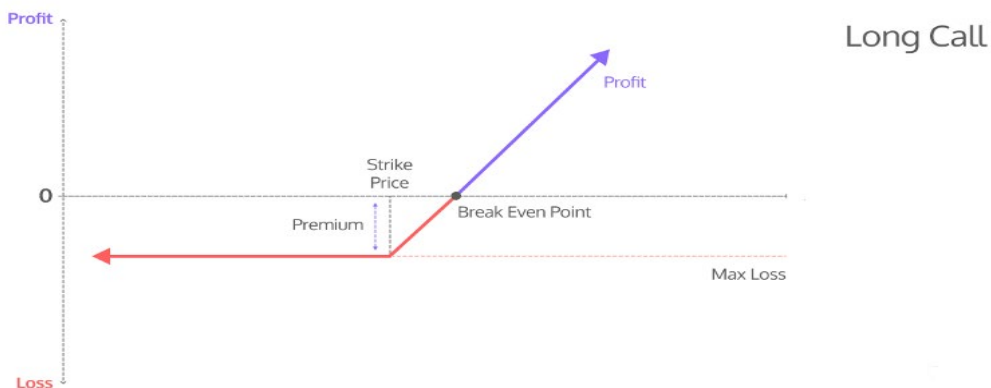
ATM options majorly have time value and may or may not have small intrinsic value. Example for Call Strike price 440 when CMP is 441 has ₹ 1 as intrinsic value and the balance is time value.

### 5.3.5 Option Strategies:

Before understanding the strategies one thing is important to understand that if your view is right and price moves as per your view, then, you are entitled to get something. But, whether you will make a profit or loss will depend upon the fact that how much you are entitled to get. For example, you bought call of Strike Price 770 @ 8 when CMP is 765. Now if the price closes above 770 say at 772 then you are entitled to get ₹ 2 but still you will make a loss of ₹ 6 because of the price of options i.e., premium at ₹ 8.

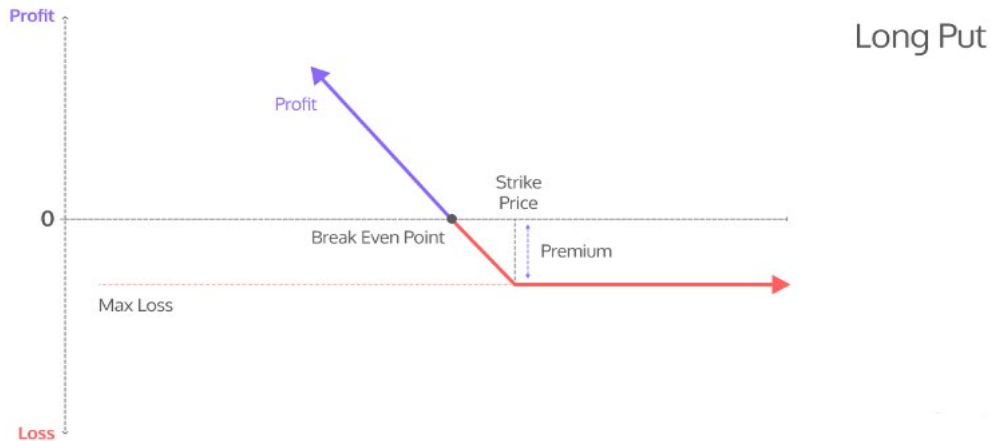
#### 5.3.5.1 Call Buy:

When a buyer buys the call, his view is that the price will go up and if the price goes up and expires above the strike price then he will get something. For example, at CMP 230, Mr. A buy a call of Strike price 240 at ₹ 5 and the price closes at 252. Then Mr. A will be entitled to get ₹ 12 and he has incurred ₹ 5, his profit is ₹ 7 ( $12 - 5$ ).



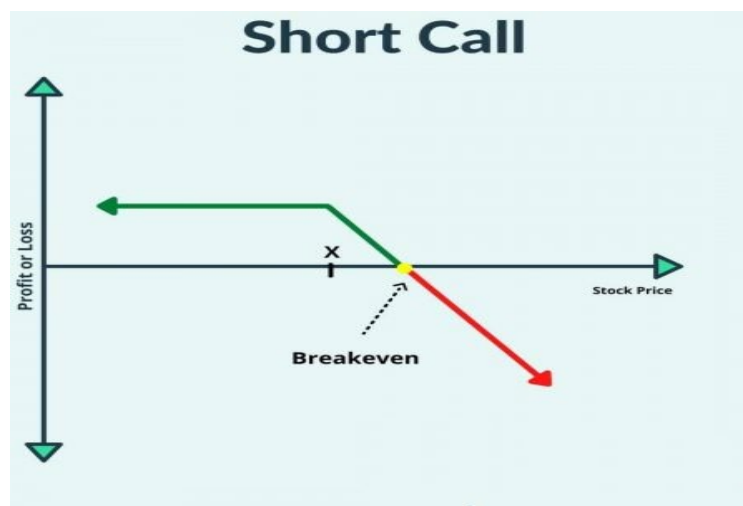
#### 5.3.5.2 Long Put:

When a buyer buys a put option his view is that the price will go down and if the price goes down and expires below the strike price then he will get something. Example at CMP of 409 Mr. A buy a put option of Strike price 400 at ₹ 6 and the price closes at 387.5. Then Mr. A will be entitled to get ₹ 12.5 and he has incurred ₹ 6 his profit is ₹ 6.5 ( $12.5 - 6$ ).



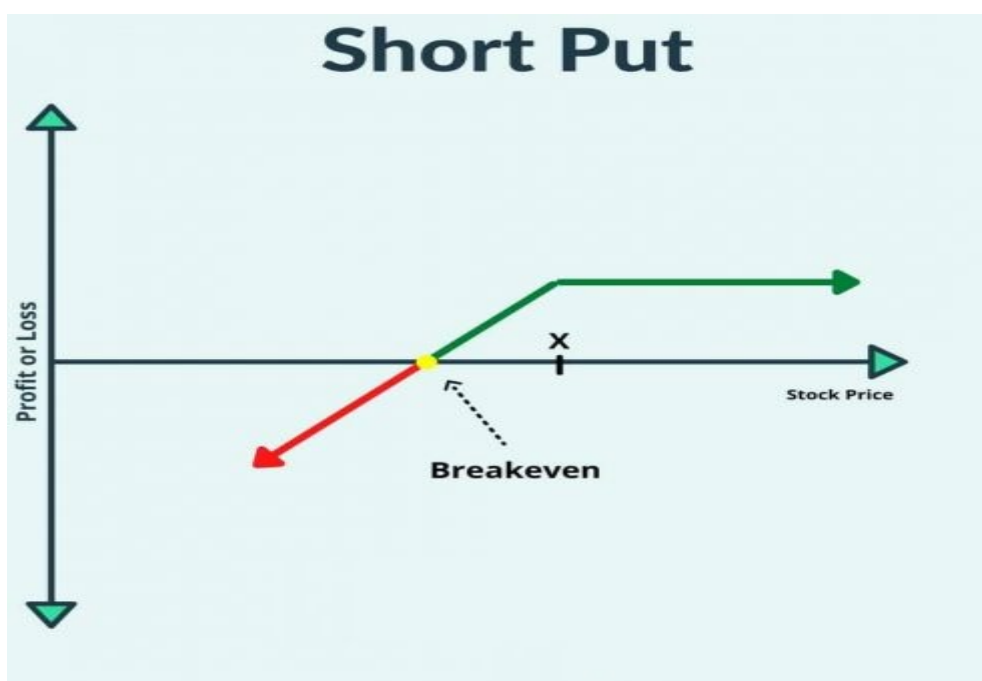
### 5.3.5.3 Short Call:

When you are shorting (selling) the call option, the view is that the price will not go above the strike price. And if the price goes above the strike price, the buyer of call option will exercise his right if it covers the price of options i.e., the premium amount.



### 5.3.5.4 Short Put:

When you are shorting the put option the view is the price will not go below the strike price. And if the price goes below the strike price, the buyer of the put option will exercise his right if it covers the price of the option i.e. the premium amount.



	Call Long	Call Short	Put Long	Put Short
<b>Loss Potential</b>	Limited	Unlimited	Limited	Unlimited
<b>Profit Potential</b>	Unlimited	Limited	Unlimited	Limited
<b>Right</b>	Yes	No Right	Yes	No Right
<b>Obligation</b>	No Obligation	Yes	No Obligation	Yes

View	Action 1	Action 2
<b>Bullish</b>	Call Long	Put Short
<b>Bearish</b>	Put Long	Call Short

## 5.4 SWAPS:

A swap is a part of derivative in which, two counterparties exchange future cash flows i.e., of one party's financial instrument for those of the other party's financial instrument.

These instruments can be almost anything, but most swaps involve cash flows based on a notional principal amount that both parties agree to. Usually, the principal does not change hands.

### 5.4.1 Important points in swaps:

1. It is an agreement between two parties to exchange cash flows in future.
2. Parties decide in advance the terms like dates when the cash flows will occur and currency in which it will be made and mode of payment.
3. Calculation of cash flows normally involves the future value of one or more market variables.
4. The swap agreement defines the dates when the cash flows are to be paid and the way they are accrued and calculated.
5. Usually at the time when the contract is initiated, at least one of these series of cash flows is determined by an uncertain variable such as a floating interest rate, foreign exchange rate, equity price, or commodity price.
6. The cash flows are calculated over a notional principal amount. Contrary to a future, a forward or an option, the notional amount is usually not exchanged between counterparties. Consequently, swaps can be in cash or collateral.
7. Swaps can be used to hedge certain risks such as interest rate risk, or to speculate on changes in the expected direction of underlying prices.

### 5.4.2 Swap Types

1. Most swaps are traded over the counter (OTC), "customized" for the counterparties.
2. Some types of swaps are also exchanged on futures markets.

### 5.4.3 Swap Bank

A swap bank is a term used to describe a financial institution that facilitates swapping arrangement between two counterparties. A swap bank can be an international commercial bank, an investment bank, a merchant bank, or an independent operator.

### 5.4.4 Features of a Swap Bank

- ◆ Serves as broker/swap dealer
- ◆ Matches counterparties but usually doesn't assume risk of swap
- ◆ Swap broker receives commission for this service
- ◆ Swap banks serve as dealers or market makers
- ◆ Willing to accept either side of a currency swap

- ◆ Sometimes, assumes a position in the swap

### 5.4.5 Examples of Swap

Suppose Mr. A lives in India has to send money to his Aunty in USA ₹ 82,000 i.e., 1000 dollars per month. But he is worried if the Dollar rate appreciates then what will happen to him.

He goes to a Swap Bank and asks for a solution. Banker says give me 5 days and will work out a solution for the same.

Now the swap banker will find some person living in USA that can constantly send dollars in India. It finds Mr. B who lives in USA and sends Dollars in India say 1000 USD per month. The swap Banker will now enter into a tri-party agreement.

Swap Banker will ensure that Mr. A must pay only ₹ 82,000 per month and assured him that all the dollar movements will not affect this contract. In the same way, it will assure Mr. B to keep paying only USD 1,000 per month and do not worry about currency movements. Swap bankers will charge small fees/commission or premium from both the parties.

Now, what this swap banker will do is, he will use the 1,000 US dollars paid by Mr. B to pay Aunty ji of Mr. A and use the ₹ 82,000 paid by Mr. A to pay for the obligation of Mr. B in INR. Thus, technically he has not allowed the currencies to cross the territories and thus will remain immune to any currency changes or in other words, Swap banker has swapped the obligations of both Mr. A and Mr. B.

In swapping, all the parties are winners i.e., it is a win-win situation for all. Mr. A and Mr. B get satisfaction and fear of adverse currency movement is taken care of. Swap banker will get his fee/commission.

### 5.4.7 Credit Default Swaps (CDS)

CDS can be defined as an insurance (not in sticker sense) against the risk of default on a debt which may be debentures, bonds etc.

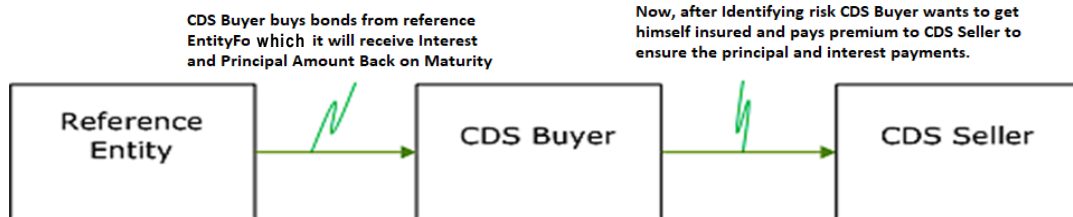
Let us take an example to understand CDS. One person who is willing to invest in bonds of a reference entity invests money in the same and buys the bonds for which it becomes entitled to get periodical interest and principal payment on maturity. Now, look at the thoughts of the buyer. If the company issuing bonds remains alive and does not default on payments then he will receive what it intended, and life will be cool. But, if the reference entity i.e. the company defaults on payments, then it will be a problem for the buyer.

So, the buyer decides to transfer his risk to CDS seller (just like insurance) by paying a fee commission or premium. He will enter a contract with the CDS seller that if the company defaults in interest and principal payments then CDS seller will pay to the CDS buyer. Now life for CDS buyer

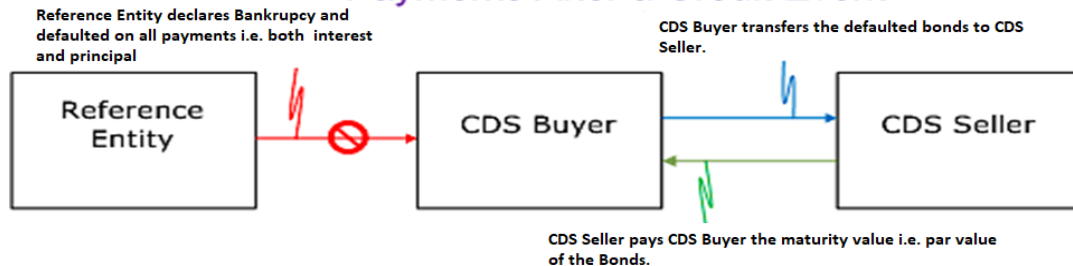
is safe. He will get his money back, preferably from the company. But if the company defaults, then the CDS seller will pay to the buyer of bonds.

## Credit Default Swap Payments

### Payments Before a Credit Event



### Payments After a Credit Event



### Interest rate Swaps:

Suppose Company A and Company B wants to take loan and the details are as follows:

Now let's see how the swapping arrangement can be done for the same:

Company Name	View	Rate of Floating rate offered by Bank	Fixed Rate Loan offered by bank	Want To take	If takes loan as wanted
A Good Credit Worthiness	Interest rates will come down	9% Base Rate +3% Base Rate = 6%	8.5%	Floating rate loan	<b>9%</b>
B Comparatively less Credit Worthy	Interest rates will go up	11% Base Rate +5% Base Rate = 6%	11.5%	Fixed Rate loan	<b>11.5%</b>
Total interest Both Company A and B pays. <b>9% + 11.5% = 20.5%</b>					



Company Name	View	Swapping Banker	Loan Rate if Swapping Banker Suggestion accepted	Whether the loan is as per the view	Agreement with Swapping Banker done
A	Interest rates will come down	Says Company A should take Fixed loan instead of Floating as desired	8.5%	No	Yes
B	Interest rates will go up	Says Company B should take Floating Rate Loan instead of Fixed loan as desired	11%	NO	Yes
Total interest Both Company A and B pays. $8.5\% + 11\% = 19.5\%$					

Here, the swapping banker sees an opportunity to save 1% interest rate on loan amount. Swapping Banker asks both the companies to enter into a tripartite agreement and the companies will take such type of loan as the swapping banker asks them to but will pay the installments as per their original view, i.e., company A will now take Fixed rate loan but will pay installments of Floating rate loan. The same applies to Company B also.

The modus operandi is that both the companies will pay to swapping banker and swapping banker will pay to the bank from which loan was taken. The benefit will be distributed between the three parties i.e., Swapping Banker, Company A and Company B. That is why it is said that swaps are a win-win situation for all the parties involved.

## TEST YOUR KNOWLEDGE

### Multiple Choice Questions (MCQs)

- An out-of-the-money option is \_\_\_\_\_.
  - An option with a negative intrinsic value
  - An option with a positive intrinsic value

- (c) An option with zero intrinsic value
  - (d) None of the above
2. Who has the right to buy underlying asset at predetermined price?
- (a) Buyer of Call option
  - (b) Seller of Call Option
  - (c) Buyer of Put option
  - (d) Seller of Put Option
3. You have shorted the Future of Gail Ltd. at ₹ 880 lot size 500. You want to make a profit of ₹ 10,000 in your trade. What should be the price of Gail so that you will make the desired profit :
- (a) ₹ 860
  - (b) ₹ 890
  - (c) ₹ 870
  - (d) ₹ 900
4. A Stock is trading at ₹ 370. The Call options of Strike price ₹ 360 is trading at a premium of ₹ 21. What is the Time value of the option:-
- (a) 21
  - (b) 10
  - (c) 11
  - (d) 31
5. The Current Market price of the Stock Mind Tree Ltd. is 740. Which among the following is deep in the money Put Option :-
- (a) Put Option of Strike Price 720
  - (b) Put Option of Strike Price 740
  - (c) Put Option of Strike Price 700
  - (d) Put Option of Strike Price 780

6. The share of Reliance Ltd. has current market price of 1020. The Call option of Strike price of 1030 will be known as :-
- (a) In-The -Money Call option
  - (b) Out-of-The-Money Call option
  - (c) At-The-Money Call Option
  - (d) Deep In the Money
7. Which of the below statement is true :-
- (a) Buyer of the Option has Unlimited loss potential
  - (b) Buyer of the Option has Limited loss potential
  - (c) Seller of the Option has Limited loss potential
  - (d) Seller of the Option has Unlimited Profit potential
8. Tick the false statement in Options :-
- (a) Buyer of the option pays the premium.
  - (b) Buyer of the option has the right and not the obligation.
  - (c) Loss of the seller of the option can be unlimited.
  - (d) Profit of the seller of the Option is unlimited
9. If you have sold a XYZ futures contract (Lot Size 50) at 5600 and bought it back at 5700, what is your gain/loss?
- (a) Loss of ₹ 10,000
  - (b) Loss of ₹ 5,000
  - (c) Gain of ₹ 10,000
  - (d) Gain of ₹ 5,000
10. If the price of the Stock is ₹ 570 the Call option of 560 strike price will be known as :-
- (a) In the Money
  - (b) Out of the Money
  - (c) At the money
  - (d) Deep out of the Money

### Theoretical Questions

1. Define Hedging.
2. Write a note on Arbitrage.
3. What are the risks in Derivatives?
4. What is Contango?
5. Differentiate between Cash Settlement and Physical Settlement in options contract.
6. Discuss the differences between Intrinsic Value and Time Value?

### Practical Questions

1. Miss Sherlyn sold the futures contract of a Stock at CMP 758. Now, she is worried about her position. Suggest to her the ways to protect her position.
2. The CMP of a stock is 977 Put option of Strike price 990 is 32. Calculate Intrinsic Value.
3. Mr. Akash purchased a 3-month call option for 200 shares in ABC Ltd. at a premium of ₹ 25 per share, with an exercise price of ₹ 500. He also purchased a 3-month put option for 200 shares of the same company at a premium of ₹ 10 per share with an exercise price of ₹ 400. The market price of the shares on the date of Mr. Akash's purchase of options, is ₹ 450. Calculate the profit or loss that Mr. Akash would make if the market price fell to ₹ 325 at the end of 3 months.
4. ABC bank has loaned \$50 million to a company for 6 years requiring periodic interest payments equal to LIBOR + 2.4%. The bank's policy requires all loans to be backed by a credit default swap on the principal amount of loans made. In this case, the bank can buy a CDS with a notional amount of \$50 million. The CDS costs 3%.

What is the annual premium bank must pay to the CDS seller? Also calculate the amount which the CDS seller must pay to ABC Bank in case the borrower defaulted on the final principal payment and bank was able to collect only 60% of its principal amount.

## ANSWERS/SOLUTIONS

### Answers to Multiple choice Questions:

1.	(c)	2.	(a)	3.	(a)	4.	(a)	5.	(d)
6.	(b)	7.	(b)	8.	(d)	9.	(b)	10.	(a)

### Answers to Theoretical Questions:

1. Please refer to paragraph 1.6
2. Please refer to paragraph 1.6
3. Please refer to paragraph 1.5
4. Please refer to paragraph 5.2.3
5. Please refer to paragraph 5.3.3.1
6. Please refer to paragraph 5.3.4

### Answers to Practical Questions:

1. There are multiple ways to hedge the short position in Futures contract:
  - (a) Buy Call option (also known as Protective call)
  - (b) Sell Put Option (also known as covered put)
2. Intrinsic value shall be  $990 - 977 = 13$ .
3. Since the market price at the end of 3 months fell to ₹ 325 which is below the exercise price under the call option, the call option will not be exercised. Only put option is viable.  
  
The gain per share = ₹ 400 – ₹ 325 = ₹ 75  
  
Total gain per 200 shares = 200 shares x ₹ 75 = ₹ 15000  
  
Cost of premium paid = (₹ 25 x 200 shares) + (₹ 10 x 200 shares) = ₹ 5000 + ₹ 2000 = ₹ 7000  
  
So, net gain = ₹ 15000 - ₹ 7000 = ₹ 8000.
4. The bank must pay an amount equal to 3% of the notional amount to the CDS seller each year. Annual premium amounts to \$1.5 million (3% × \$50 million).  
  
If the borrower defaults on the final principal payment and the bank collects only 60% of its principal back, it can claim the differential from the seller of the CDS.  
  
The amount it will receive from the CDS seller is approximately equal to \$20 million (\$50 million × (1 – 60%)).  
  
If the borrower doesn't default on the final principal amount, the bank will not receive anything from the CDS seller.