Link: https://youtu.be/fDODh7Ne2Ww

# Derivatives

Derivatives are the elements that derive their value from their underlying asset

Below are the examples:

1. A 10₹ note and 2000₹ are of same material, but the RBI governor sign on it is indicating that the 2000₹ note is of 2000 value differentiates 10₹ and 2000₹. HERE THE SIGN IS THE DERIVATIVE AND POWER OF RBI GOVERNER IS THE UNDERLYING ASSET
2. In a contract of land buying. The sellers sign on the contract paper for advance (token amount), acceptance will stop seller from selling the land for a certain period of time (as per contract) and gives buyer to buy the land at a same price for a certain period of time, meanwhile seller has the edge of taking the token amount as profit if the seller is not able to provide the money in stipulated amount of time. HERE THE SIGNATURE IS THE DERIVATIVE AND THE OWNERSHIP OF LAND, THE SELLER HAS IS THE UNDERLYING ASSET

## Categories of derivatives

Derivatives are categorized in to 4 types

1. Forwards
   1. Physical contracts that are generally used in everyday life, stock markets use their next version FUTURES
2. Futures
3. Options
4. Swaps

Expiry in futures is categorized in to 3 types:

1. Near
   1. If you are in OCT 2022 and if you buy ICICI future contract of the same month i.e., ICICIBANK OCT FUT, then that is called Near expiry
2. Next
   1. If you are in OCT 2022 and if you buy ICICI future contract of the next month i.e., ICICIBANK NOV FUT, then it is called next expiry
3. Far
   1. If you are in OCT 2022 and if you buy ICICI future contract of the month after the next month, i.e., ICICIBANK DEC FUT, then it is called far expiry

# What are Futures

Futures is also a contract, like other contracts has an expiry date, futures also has an expiry date.

You can buy/sell futures

## What is a lot size?

A lot size is the measure for a future scrip contract, a lot size can be better explained with banana analogy: we can buy banana’s in dozen, whereas one dozen of bananas =12. Similarly we can buy future scrip in lots

### Points to note:

All scrips does not have same lot size, in general scrips of higher share price will have less number of units as lot count, scrip price is inversely proportional to lot size

|  |  |  |  |
| --- | --- | --- | --- |
| scrip name | scrip price | lot size | price required to buy future of scrip = scrip price \* lot size |
| tata motors | 409 | 1425 | 582825 |
| TCS | 3163 | 150 | 474450 |

## Is it mandatory to have the above-mentioned amount?

No, it is not required to have all amount before expiry, you need to have the amount mentioned by the broker, **but on the date of expiry you need to have the amount if you want to proceed with the contract, more details on this will be covered in the later parts of this documentation.**

## How do future prices increase or decrease?

If the underlying scrip price increase, then future price increase, and vice-versa with price decrease (with a few variables (like gamma, theta, Vega and delta) involved).

## Why are Futures used (for whom was it intended, and who are using it now)?

Futures are introduced for hedging

### What is hedging?

Hedging means **protect oneself against loss on (a bet or investment) by making balancing or compensating transactions.**

### How is hedging needed in stock market- an analogy

#### How investors are meant to be using it

Let’s say you are holding 3000 tata motors shares and the company is going to post its quarterly results in 3 days, all other automobiles companies posted bad results, therefore you are thinking that tata motors is also going to post results on similar lines with other automobile companies, which will lead to loss of your portfolio value, but you already know that tata motors is a good company with strong fundamentals, and the fall in share price is going to be temporary, so instead of selling your 3000 tatamo shares (which might lead to charges and other headaches), you can sell 2 lots of tatamo future scrip and buy them later at a fallen price, therefore the price fall in your original shares is covered up by the future lot you sold, a brief calculation is below

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| scrip name | scrip price | shares held | price required | fall in price | loss incurred per share |
| tata motors | 409 | 3000 | 1227000 | 80 | 240000 |
|  |  |  |  |  |  |
| future scrip | scrip price at which you sold | lot size | lots held |  |  |
| tata motors nov | 409 | 1425 | 2 |  |  |
|  | scrip price at which you bought (409-80(loss incurred per share)) |  |  | profit occurred |  |
|  | 329 |  |  | 228000 |  |
|  |  |  |  |  |  |
| loss minimized because of hedge: | loss without hedging | = loss incurred per share -profit occured |  |  |  |
|  | 240000 | 12000 |  |  |  |

#### How are traders using it?

##### For selling

Actually you can not carry a sell position in the normal scrip for more than one trading day, but traders who are sure that a scrip is going to fall, will **sell** the future scrip and **buy again at a lower price** to take profits, but there is a **downfall to it** as well, if after selling the scrip, if the scrip starts going up instead of falling down, then trader has to pay extra amount (which will be his loss), vice a versa applies for buying as well

##### For buying

Traders who are sure that the scrip is going to go up and they think they need to buy more with the less amount, they have, they will **buy** the scrip and **sell** later again at a **higher price**

#### Why traders prefer buying futures and options (FNO) rather than buying/selling actual scrips

Buying/selling actual scrips require more money and also selling actual scrips can’t be more than one day(in delivery or intraday)

If you are buying 1500 shares of tata motors, you need 6,00,000

But to buy FNO contract you need around 40% of 6,00,000

### What happens if buyer/seller holds his future scrip till expiry

Theoretical explanation

From seller point of view:

On expiry he has to give the lot (number of shares) to the buyer and receive share price\*lot amount

From buyer point of view

On expiry he has to give money to seller and has to get shares in return

Example explanation:

Contract name: OCT 2022 SBI FUT contract

Price: 310

Lot size: 3000

If a seller and buyer are involved in contract, then

buyer has to give 3000\*310 = 930000 rupees to buyer even **if sbi share price is 400 or 200 or 0**

seller has to give 3000 shares (lot size) to seller and receive 930000 from seller **irrespective of share price**

#### What if seller does not maintain shares or buyer does not have enough money in their account:

The broker will check for relevant requirements 2 or 5 days before and will try to inform you over call or other communication channel and then square off the position in case you don’t have needed requirements

## Other advantages of Futures

Not only stocks, we have metals, Agri commodities, crude oil and water also have Futures

Let’s take the example of gold and try to explain it with an analogy

### An question here: How do gold shops make profit?

We are generally under the assumption that people involved in gold business try to buy bulk gold, when the price is cheaper and make ornaments and sell them. BUT WE ARE WRONG…

There is a saying **only two people know top and bottom of the market, GOD and THE LIAR. AND trying to time the price is similar to GAMBLING, because price depends upon various factors, let’s say the price of gold is X, if the next moment America declares war on Russia, the gold price might become 2X, if the india discovers a gold mine which is almost equal mining of gold that is discovered till date, then the gold price might become X/2**

I am fairly fantasizing the example, but only **a idiot does business on speculation**

**So, coming to the question again how does jewellery companies do business?**

They just make profits on the making charges, then how do they maintain same profit on fluctuating prices (if they bought gold at 100 rupees and making charge is 10 rupees so totally it is 110, if the next day gold price falls to 80 rupees, then they cant sell it at 110 because people wont buy gold if it is sold at a higher price, so they have to sell at 90 rupees (80 rupees gold price + 10 rupees making charge) but if they sell at 90 they are at effective loss of 20), the ANSWER is FUTURES OF GOLD,

If they buy 1kg gold at x rupees, then they will sell futures of 1kg gold at x rupees, so that if the price increases the future contract they sold will be at loss, but the value of the gold they are holding will increase. So now if they maintain healthy margin of making charges, they can be profitable all the time.

### Why should people deal with futures of metals or commodities or oils

Crude oil is needed for paint companies, tyre companies

Metals are needed for automobile companies, infra companies

Commodities are needed for countries

**Apply the same logic of above gold example to all these scenarios**

### When should you deal with futures

You should be dealing with futures in three scenarios

#### Scenario 1- if you have already bought the stock and you need to protect from future fluctuations

If you **buy** x amount of an item at y price, then **sell** same amount of futures of the same item at the Y price

#### Scenario 2- if you don’t have the item with you and you want to protect yourself from future fluctuations

if you have money, but if the commodity is not available then you can **buy** required amount of commodity **future** prices at current time

#### scenario 3- if you want to speculate and earn money

you can sell futures, if you think corresponding commodity price is going to fall, then **selling** commodity futures, and **buying** if Vice a versa happens

## Expiry

There are two types of expiries based on duration

### Weekly expiry

Available in Options (that too only for Indexes like Nifty, BankNifty)

When do weekly option contracts expire?

Weekly contracts expire on Thursday, if it is a holiday, then working day before that Thursday will be the expiry day.

### Monthly expiry

Available in both Futures and Options

When do Monthly option/futures expire?

Monthly contracts expire on last Thursday of the month, if it is a holiday, then the working day before that Thursday will be the expiry day

## spot price, future price

the price of the underlying asset is called spot price

the price of a future contract of the underlying asset is called future price

## settlement types

there is 2 types of settlement available

### Cash settlement

Before July 2018, cash settlement is an option, in cash settlement, lets assume

1: you bought tatamotors future contract on 4th nov 2022 at 330 and expiry is at 24th nov 2022 and you held it till expiry and at expiry the price is 340, 10₹ profit\*lot size(5700) = 57000₹ will get credited to your demat account

2: you sold tatamotors future contract on 4th nov 2022 at 330 and expiry is at 24th nov 2022 and you held it till expiry and at expiry the price is 340, 10₹ loss\*lot size(5700) = 57000₹ will get debited to your demat account

### Physical settlement

From July 2018, sebi implemented physical settlement in order to avoid speculation(of people wantedly buying contracts and then settling in cash (as it requires only less money)), in physical settlement, **if you are a buyer- you need to have required amount (future price\* lot amount) to hold the contract till expiry, if you are a seller- you need to have required amount(number of lots\*lot size) of shares in your demat**

lets assume

1: you bought tatamotors future contract on 4th nov 2022 at 330 and expiry is at 24th nov 2022 and you held it till expiry and at expiry the price is 340, you need 330 (buying price) \*5700 = 18,81,000 in your account to carry it on till expiry, if the required amount is not there in your account a couple of days (time frame is decided by the broker or exchange(ex:NSE)) before the expiry then your contract will get squared off (sold or exited)

2: you sold tatamotors future contract on 4th nov 2022 at 330 and expiry is at 24th nov 2022 and you held it till expiry and at expiry the price is 340, you need to have 5770 shares at 330 rupees in your demat a couple of days (time frame is decided by the broker or exchange(ex:NSE)) before the expiry then your contract will get squared off (sold or exited)

### Types settlements for different instruments

Equity -> physical

Index -> cash

Commodities -> physical for few, cash for few

Currency -> cash

## margin and settlement concept

margin – how much amount is needed to buy/sell a contract or instrument

### how much money we need to buy/sell futures

delivery (NRML margin), intraday types

Buying and selling of future can be of 2 types

1: Delivery (holding for more than 1 day)

2: Intraday (holding for one day)

Money that we need to buy/sell a contract is **same for both intraday and delivery**. The amount that needs to be there to buy them will **slightly differ from broker to broker**

You can get the details of the amount needed by your broker by googling the “<broker name> margin calculator” ex link: <https://zerodha.com/margin-calculator/SPAN/>

### how profit/loss or settled in futures

profit/loss settles on day-to-day basis

let’s say today is 6th November 2022. And 7th you bought a future contract and you don’t have any balance left in your account

|  |  |  |
| --- | --- | --- |
| date | profit/loss | cumulative profit/loss |
| 07-11-2022 | 10000 | 10000 |
| 08-11-2022 | 15000 | 25000 |
| 09-11-2022 | -40000 | -15000 |

If by 9th November 2022, if you don’t maintain 15000 in your account so that the broker than settle your 15000 losses, then you will attract extra penalty and broker gets the right to terminate your contract altogether.

Doubt: does the contract gets squared off the next day we does not maintain balance, or does it wait till the contract expiry?

It is always suggested to maintain 50% of the contract value as an additional bonus to avoid the beginners mistake of attracting penalty

## Future Pricing (V imp)

Future price is proportional to the remaining days of expiry

the price of the current month contract < price of next month contract

### formula to calculate ideal future pricing

Text

Description automatically generated

#### Why this formula is of less relevance/importance

No matter how much you calculate, you are ultimately going to buy at the price which is available in the market

Also, there are very big people with most advanced systems and more professionals looking at these and trying to get them at the best price, the goal as of now for us will be to just focus on the initial earnings and then to focus on these types of things later

**Most of the times, The price that is there in the market- it is there for a reason and the price always tries to find its balance, so don’t give much importance(but give importance it deserves) to the price**

### Factors influencing contract price

1. Number of days left till expiry – **spot price>near expiry>next expiry>far expiry**
2. Dividend – if a company gives dividends, that’s deducted from stock price, then you also have to deduct it from future contract price
3. Market sentiment – if there are bullish sentiments, then buyers increase, therefore prices of stocks and future contracts increase, vice-a-versa for bearish contract

#### When does future price<spot price

1. When there is a dividend announced [formula](#_formula_to_calculate)
2. When there is panic in market

# Options

## Why should we learn options carefully

**Options is important** because 85% of the profit comes from options, **options is dangerous** because 90% of the traders like us lose money in options

## What is call or put

If you think market/particular stock option is going to increase, then you will **buy** call option

If you think market/particular stock option is going to increase, then you will **buy** put option

**If call value is indirectly proportional to put value**

### Relation between spot price, future price, call price and option price

Spot price is directly proportional to future price and call price

Spot price is indirectly proportional to option price

### When to buy what

If you think a stock is going to go up, then

1. Buy that stock or
2. Buy that stock’s future option
3. Buy that stock’s call option
4. Sell that stock’s put option

If you think a stock is going to go down then

1. Sell that stock or
2. Sell that stock’s future option
3. Sell that stock’s call option
4. Buy that stock’s put option

## Similarities between futures and options

* They have same lot size
* They almost have similar settlement with slight variation
* Both have OI

## What process happens between an option buyer and option seller during a transaction

Before we understand, what happens between a buyer and seller, let us go through an analogy

### An analogy

Lets say there is a land, and there is an insider speculation that a ring road is coming near it, so you go to the land owner and say let us make an agreement for 5 months, I am giving you a **token amount** of 10,000 if I come within 5 months and ask you for this land you should sell me at a fixed price of 50 lakhs, if I don’t come within stipulated time, you can keep the token amount and sell it to someone else at the price of your wish

### Real time example

Let’s say there is tatamotors spot price at 330 and you buy call option tatamotors 330 CE (call option) at 15 rupees (**premium**), then you have to pay 15\*5700 (lot size) = 85500 to seller so that **seller will offer the 5700 tatamotors shares at 330 rupees,** because **option buyer has the right to ask shares at the prefixed rate, but seller cannot force buyer to buy the stocks**

If anyone is buying the option tatamotors 330 CE, then he/she is under the assumption that the stock is going to go up, if anyone is selling the option tatamotors 330 CE, then he/she is under the assumption that the stock is going to go down or will be staying at 330 or 330+premium range

### Different types of cases (possibilities) **on expiry day**

Lets say seller sold tatamotors 330 ce to buyer at 15 premium

|  |  |  |  |
| --- | --- | --- | --- |
| case | Buyer at | seller at | explanation |
| if expiry happens at 330 | loss | profit | if the expiry happens at the same price of the contract, then the buyer can get the stocks from open market at the same price and then the seller can have the token amount,the buyer loses the token amount |
| if expiry happens at 330+premium(15) i.e, 345 | no loss | no loss |  |
| if the expiry happens above 330+premium(15) i.e., 350,360… | profit | loss | the profit for the buyer is (expiry price - (entry price + premium)) \* lot size |
| if the expiry happens below 330 i.e., 280,260… | loss | profit | Token amount 85500, because the buyer does not have any mandatory rule to buy, he can buy if he wants, but no buyer wants to buy at loss |

The seller utmost can have the token amount as profit (because if the price happens to fall below the contract, the buyer will forgo the token amount), but the buyer can have utmost profit because, if the contract happens at 330 and the stock price goes to 1000 or even more before expiry, still the seller has to sell the lot at 330 per share, which is a loss to seller but unlimited profit to buyer

Risk profile

Buyer- risk limited, profit unlimited

Seller- risk unlimited, profit limited

### Important point to note

In the above discussed table **we discussed all scenarios at expiry date,** in all the above scenarios buyer has only one scenario where he gets profit

**But is it the only case where buyer gets profit?**

**No, there is another scenario where the option buyer can have profit**

let’s say the buyer has purchased tcs 3500 ce at 5 premium, the next day underlying stock moved up because of some positive news, then let’s say premium moved up to 10, then [(current premium - buying premium)\*lot size] (10-5)\*200 will be the profit

## Misc

* All shares are not in FNO, if a share is in derivative, then they have both FNO as they are interrelated
* Even indexes, metals, currencies have FNO