

# FUTURES & OPTIONS

BLUEPRINT

Beginner's Everything Guide  
to Futures and Options



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Beginner's Everything Guide  
to Futures and Options

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# HOW TO USE THIS BOOK?

- **Learn By Doing:** This book like any other book is designed in a Hands-on Manner. You learn the most when you actually do something along rather than just reading/listening about it. Make sure you practice along to get the maximum value out of this book. Practice, practice, and practice. That is the key!
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**LET'S GET STARTED WITH OUR LEARNING. IT IS GOING TO BE AN AMAZING LEARNING EXPERIENCE!**

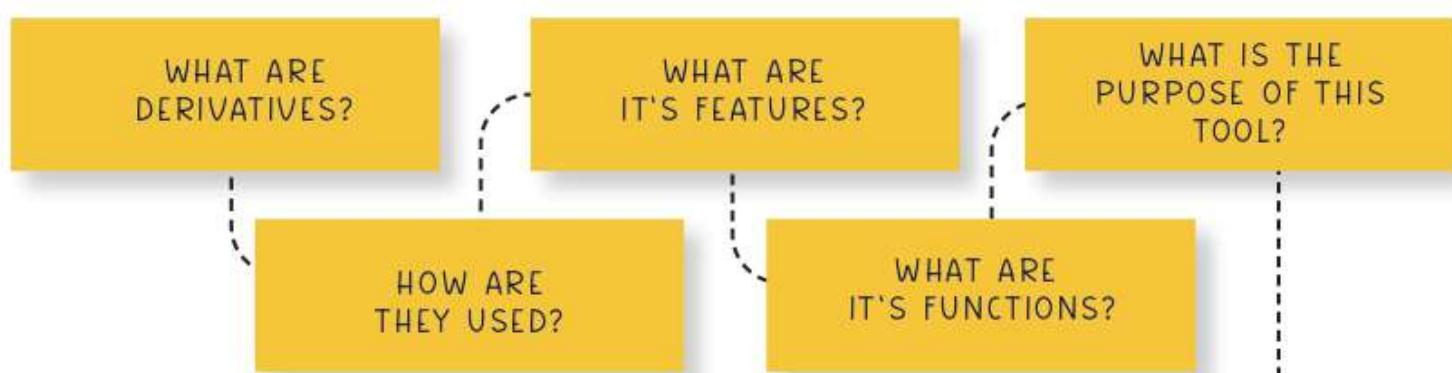
# INTRODUCTION

The making of **FUTURES & OPTIONS BLUEPRINT** came from the objective and mind set of providing a solution to the key challenges that an amateur might face while entering the world of trading.

For this reason, the reader will be brought to the guidance of Derivatives from absolute scratch. So even if you come from zero exposure to derivatives, this book will take you to a hundred.



In this book, we have provided with the learning of **OPTIONS, FORWARDS AND FUTURES** from basic to advance levels. So, you do not have to bother about your background; just leave it all to us.



From what are derivatives, how are they used, their functions and features to what is the purpose of this tool in the world of traders? We have compiled it all at one place for you in this book.



YOU WILL BE AIDED WITH A BASIC TO ADVANCE LEVEL OF UNDERSTANDING OF THESE INSTRUMENTS THAT COME IN HANDY WHILE TRADING.

The book is for aspirants willing to have a career in brokerage firms or anyone looking forward to getting started with trading activities. The book equips you with an understanding of derivatives that can then be employed to analyse futures and options available on indices like NIFTY 50 and some indices on SENSEX, and/or stocks like,



**Bata**



**TATA**

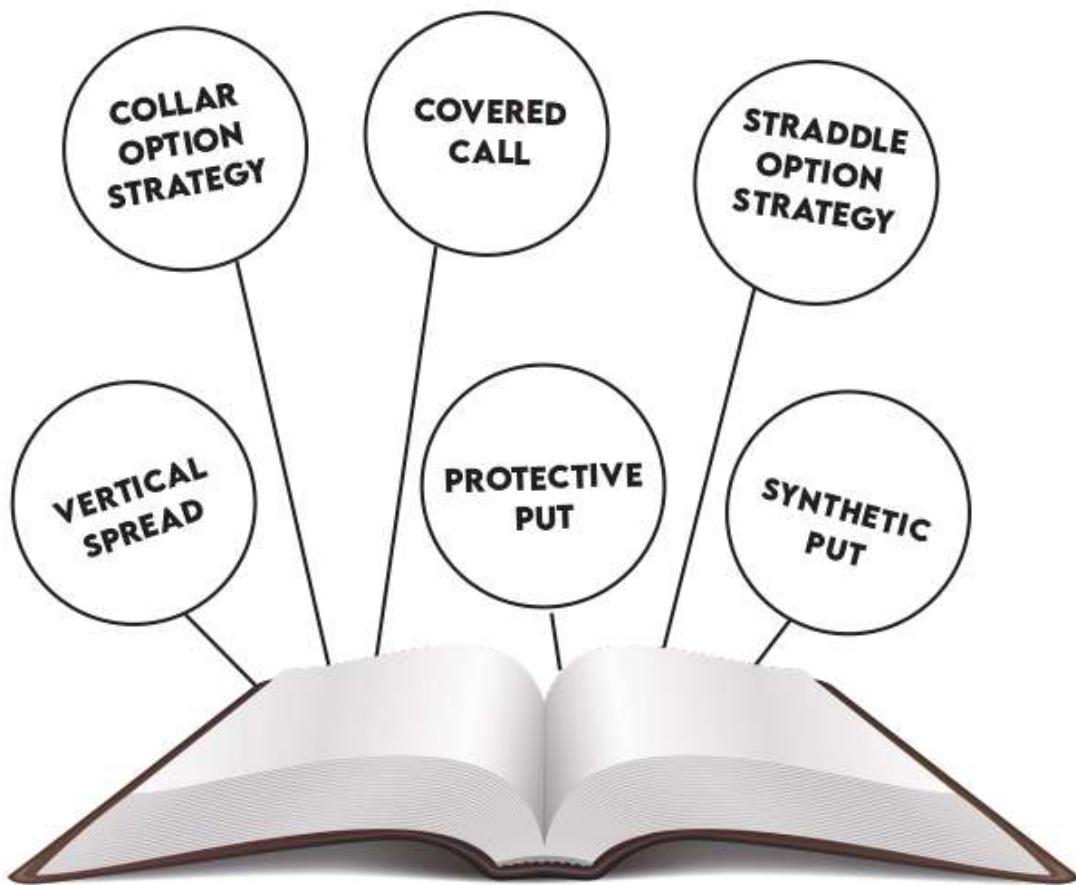
**Cipla**



**adani**



**Reliance**



The content includes theoretical knowledge which will help you in the risk management of your portfolio and thereby earn smart profits by reducing the chances of incurring losses. Talking about the portfolio, the book supplies a vision to better park your assets via asset allocation that is reasonably suitable for your trading purposes.

BY THE END OF THE BOOK, YOU WILL HAVE A WIDER KNOWLEDGE OF DERIVATIVES THAT CAN THEN BE USED TO FORMULATE YOUR OWN STRATEGIES FOR TRADING OR INVESTING BY USING AND CREATING VARIED METHODS.



Note that Technical Derivatives Analysis, which offers a deeper understanding of how and when to place orders using derivatives, is out of the scope of this book. The same can be mastered in our **Trading Mastermind Course** content.

ZebraLearn has everything packed in this book for you to unveil the world of Derivatives right from the point you begin. So, let us get started, shall we?

## WHOM THIS BOOK IS FOR ?

THIS BOOK BEGINS FROM ABSOLUTE SCRATCH. NO BACKGROUND IN FUTURES AND OPTIONS IS REQUIRED.

WANT TO LEARN ABOUT FUTURES AND OPTIONS IN DETAIL. WHAT WAS THE PURPOSE OF THESE AND HOW SHOULD WE USE THEM?

IF YOU ARE INTERESTED TO MAKE A CAREER IN TRADING ACTIVITIES THEN IT BECOMES IMPORTANT TO UNDERSTAND HOW TRADING IN DIFFERENT INSTRUMENTS INCLUDING FUTURES AND OPTIONS IS DONE.

## WHY THIS BOOK THEN ?



This book covers from basics to advance level of learning Futures and Options.



You will be in a position to formulate your own strategies for trading using different methods.



You will be able to understand and analyse futures and options available for indices and stocks.



Also this book includes theories which will help you earn smart profits and reduces the chances of losses.

# CONTENTS

## INTRODUCTION

4

## 01

### WHAT ARE DERIVATIVES?

1.1 Meaning	14
1.2 Classes of core assets	16
1.3 Why do we even have derivatives?	22
1.4 Spot trading and Forward trading	23
1.5 Purpose of Derivative	29
1.6 Types of Derivatives	30
1.7 Who uses Derivatives?	34
1.8 Hedging Vs Speculation	40

## 02

### FUNDAMENTALS OF FORWARD CONTRACTS

2.1 Introduction	44
2.2 What happens on the date of settlement?	46
2.3 What is forward contract ?	48
2.4 Conclusion	58

## 03

### FUNDAMENTALS OF FUTURES CONTRACTS

3.1 Introduction	62
3.2 What happens on the date of settlement?	65
3.3 Important terms to understand Futures	68
3.4 Difference between Long and Short position	81
3.5 Features of Futures contract	82

3.6 What does a futures contract quotation look like?	83
3.7 Working of Futures Contract	84
3.8 What does mark to market mean?	94
3.9 Different Futures Contracts	100
3.10 Reasons for difference between Spot price and Futures price	104
3.11 Does the market converge to spot price = futures price ?	108
3.12 Conclusion	109

## 04

### COMPARISON OF FORWARDS AND FUTURES CONTRACTS

4.1 Introduction	112
4.2 Similarities of forwards and futures contract	113
4.3 Difference between forwards and futures contract	116
4.4 Conclusion	122

## 05

### FUNDAMENTALS OF OPTION CONTRACTS

5.1 Introduction	126
5.2 Important terms to understand Options Contract	131
5.3 What does an options contract quotation look like ?	140
5.4 How does an options contract work?	142
5.5 Moneyness of options contract	155
5.6 Option payoffs	161

## 06

### BASICS OF OPTIONS PAYOFF CHARTS

6.1 Introduction	166
6.2 Understanding payoff charts for Call options	168
6.3 Understanding payoff charts for Put options	172

# 07

## PUT CALL PARITY

7.1 Introduction	182
7.2 What does the put call parity relationship say?	184
7.3 Assumptions of Put Call Parity	188
7.4 Put Call Ratio (PCR)	191

# 08

## OPEN INTEREST AND VOLUME

8.1 Introduction	198
8.2 How does Open Interest help us identify Support and Resistance Zones?	203
8.3 What is an Option Chain?	204
8.4 How to trade through Option Chain?	206

# 09

## OPTION PRICING

9.1 Introduction	210
9.2 Components of premium of options	211
9.3 Factors affecting the Price or Value of an option	216
9.4 Black Scholes Pricing Model	221
9.5 Variables affecting the pricing as per Black Scholes Model	223
9.6 What are Option Greeks?	231

# 10

## OPTION STRATEGIES

10.1 Introduction	236
10.2 Protective Put Strategy	237
10.3 Synthetic Put Strategy	244
10.4 Covered Call Strategy	248
10.5 Straddle Option Strategy	253
10.6 Payoff Charts for Long Straddle	260
10.7 Payoff Charts for Short Straddle	262
10.8 Collar Option Strategy	264

# 11

## VERTICAL SPREAD OPTION STRATEGIES

11.1 Introduction	270
11.2 Types of spreads	271
11.3 Bull Call Spread Strategy	274
11.4 Bear Call Spread Strategy	279
11.5 Bear Put Spread Strategy	284
11.6 Bull Put Spread Strategy	288
11.7 Strangle Strategy	292
11.8 Butterfly Spread Strategy	299
11.9 Things to keep in mind before entering F&O market!	309

# 12

## RISK MANAGEMENT

12.1 Introduction	314
12.2 Risk management techniques	316
12.3 Conclusion	330

# **CHAPTER 1**

**WHAT  
ARE  
DERIVATIVES?**

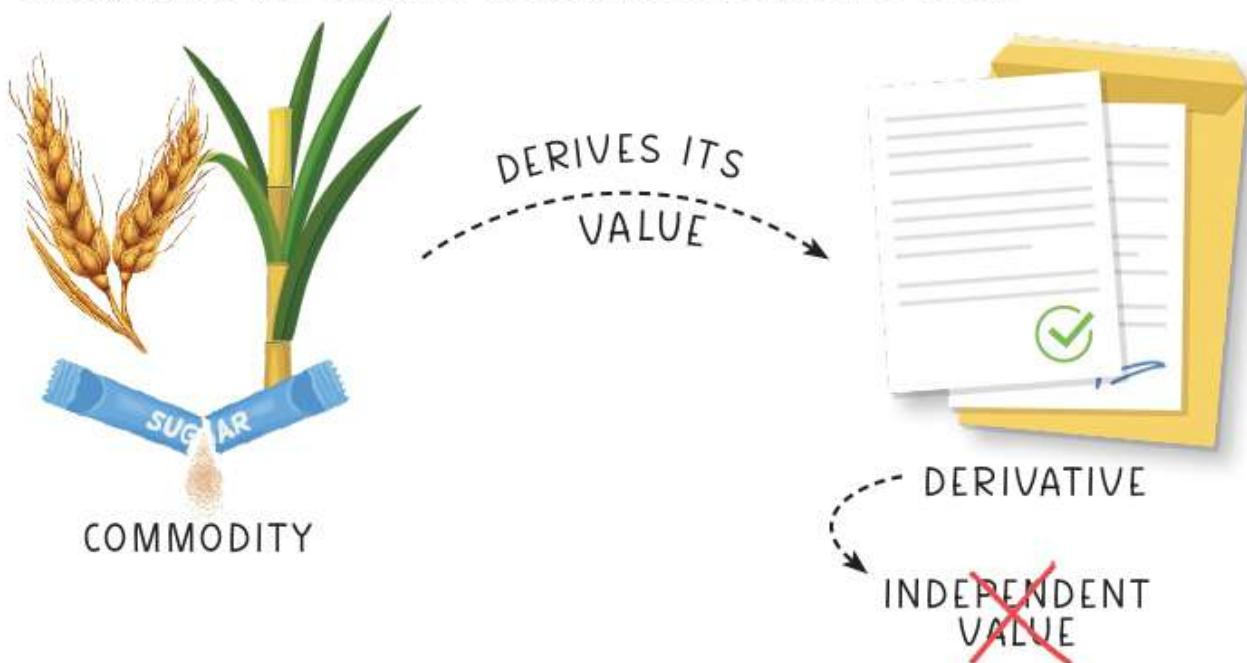
- 1.1 Meaning
- 1.2 Classes of core assets
- 1.3 Why do we even have derivatives?
- 1.4 Spot trading and Forward trading
- 1.5 Purpose of Derivative
- 1.6 Types of Derivatives
- 1.7 Who uses Derivatives?
- 1.8 Hedging Vs Speculation

## 1.1 MEANING

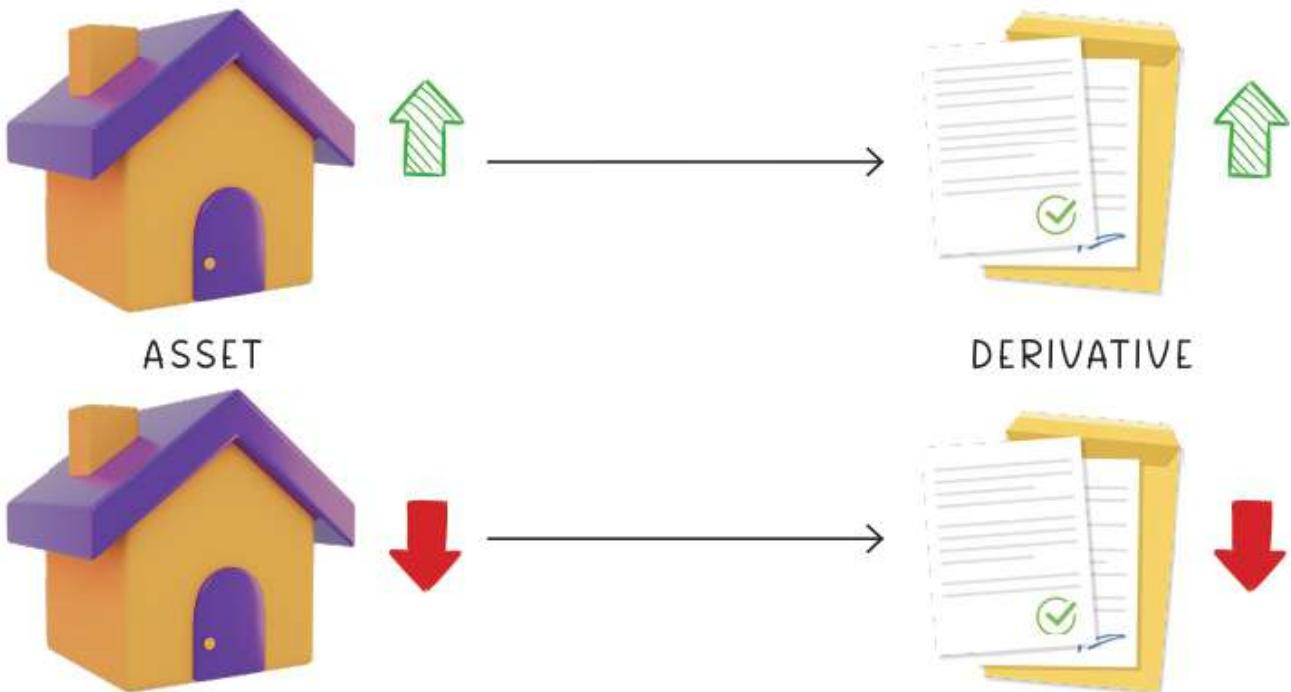


Explainer Video

The word derivatives speak for itself about its meaning. It is an instrument that derives its value from something else and does not have a value independent of that underlying (the asset on which the derivative depends for its value).



Derivatives are anything that derives its value from an underlying asset. This means that as the underlying asset changes, so do the value/price.



*Hence the derivative is directly proportional to the underlying asset for its value.*

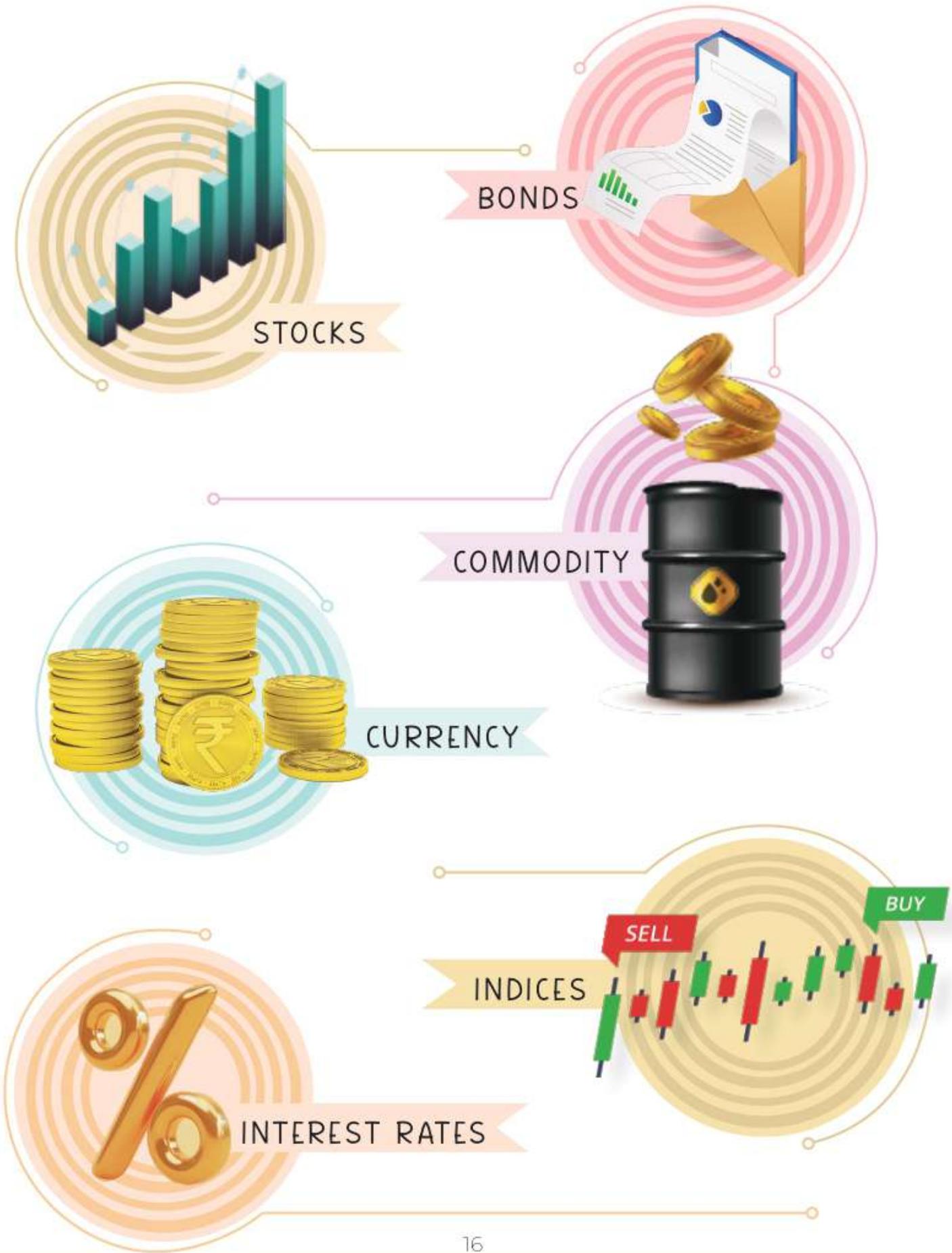
**For instance,**

if the value of a derivative is directly proportional to an underlying asset, say wheat, then if the price of wheat is seeing an increase in its value (up move), so will the derivative.

To understand the effect of wheat i.e., the underlying asset, we first need to know and understand the core assets (the asset on which the derivative depends for its value) that a derivative might be dependent on for its value.



## 1.2 CLASSES OF CORE ASSETS



## STOCKS

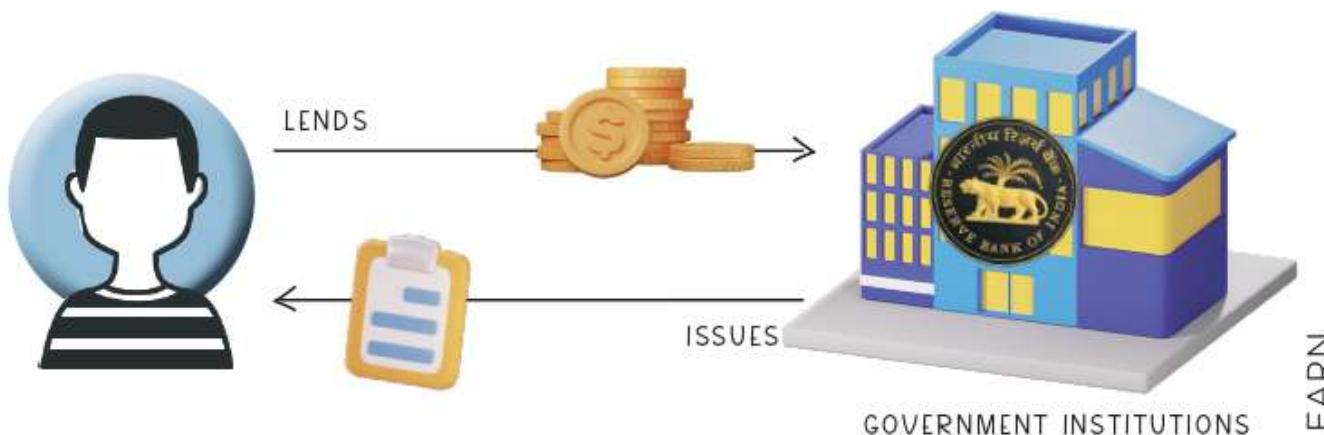
Stocks of any corporation consist of shares of the ownership of the company like RELIANCE, TCS, IDEA, IDFCFIRSTB, TATASTEEL, BHEL, COAL INDIA, VOLTAS, etc.



## BONDS

By issuing bonds a company borrows money from us. Think of bonds as an FD with govt. (Treasury-bond) or any other institution or corporation, which as a bond instrument can be traded in the market as well.

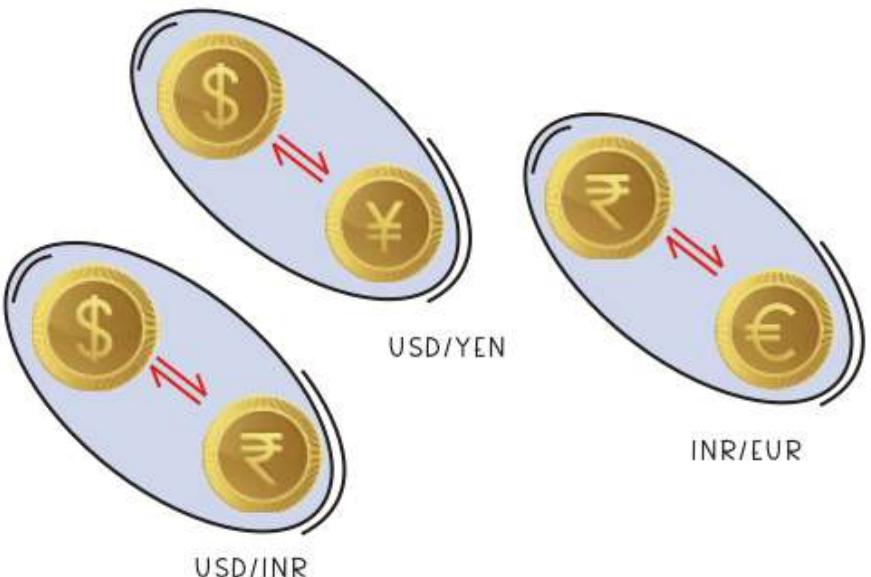
These are less heard of by retail investors since they are used by more institutional or more sophisticated investors.



A DOCUMENT THAT CERTIFIES THAT YOU HAVE LENT AMOUNT X TO A PARTICULAR COMPANY, GOVERNMENT, OR INSTITUTION (RBI, NABARD, ETC.).

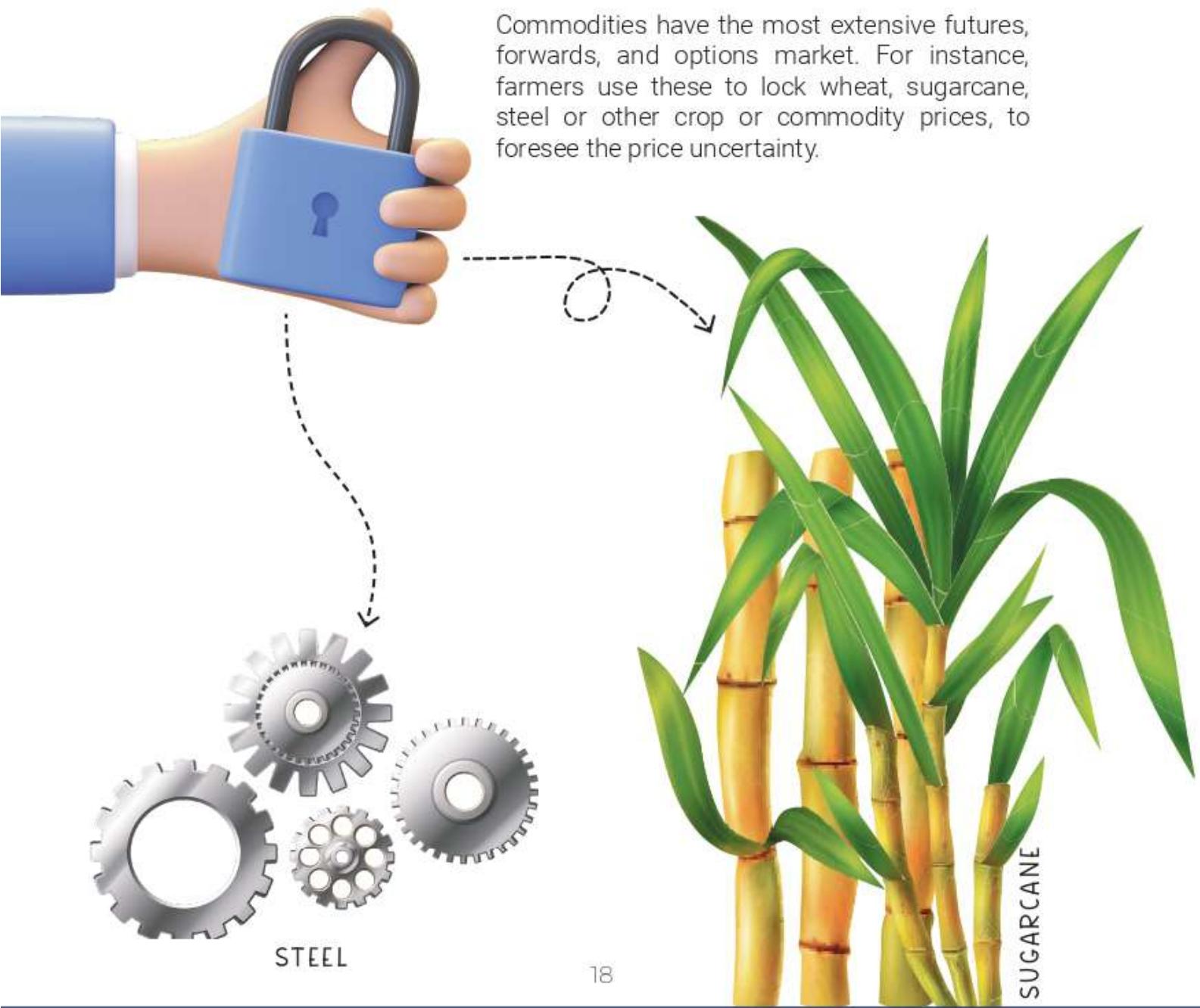
## CURRENCY

Currencies in pairs like USD/INR, USD/YEN, INR/EUR, etc. Any two currencies for that matter.



## COMMODITY

Commodities have the most extensive futures, forwards, and options market. For instance, farmers use these to lock wheat, sugarcane, steel or other crop or commodity prices, to foresee the price uncertainty.



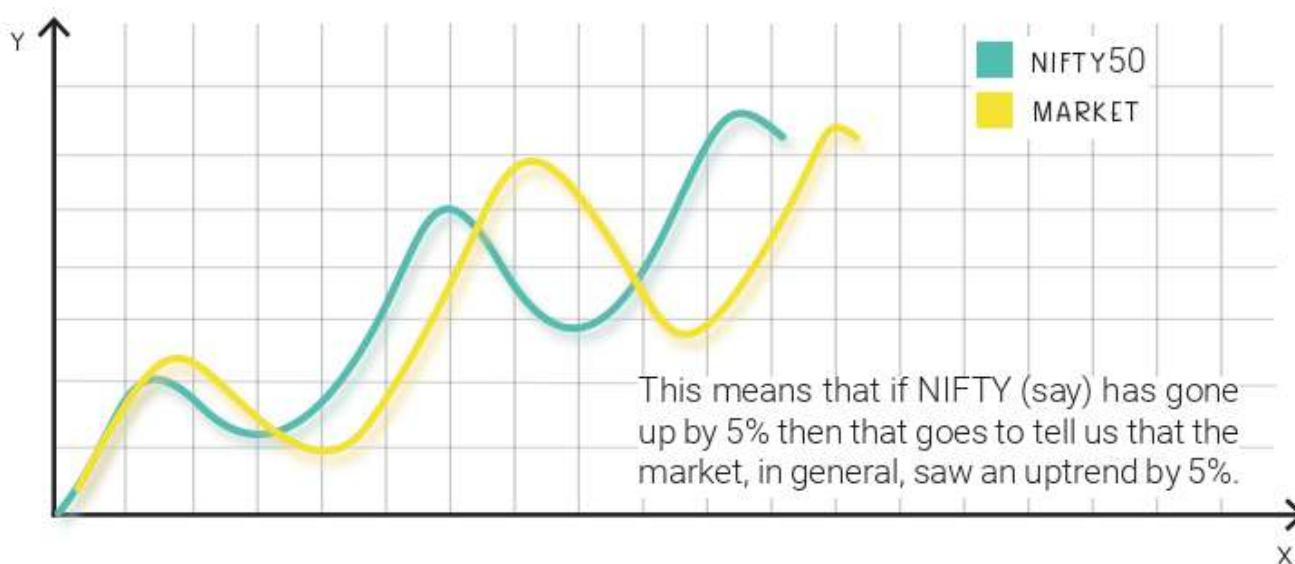
## INTEREST RATES

This is part of interest rate swap derivatives. One party here agrees to pay a **fixed interest rate in exchange for the variable interest rate** (LIBOR i.e., London Interbank Offer Rate + x%, x is constant here and LIBOR is variable).



## INDICES

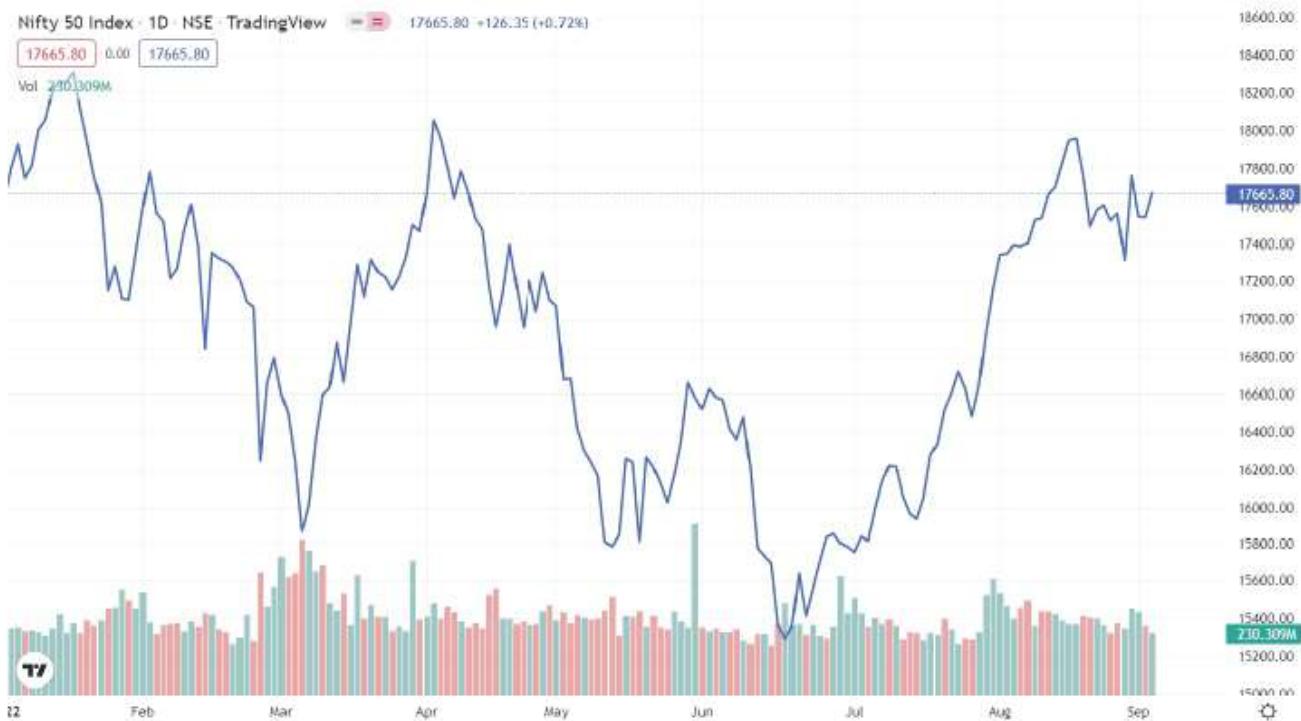
Indices are a collection of stocks that represent the complete set of stocks. Some indices namely are **Sensex, NIFTY 50, Sensex small cap, etc.**



**Note:**

*It is alright to not understand this fully, focus on understanding the types of core assets here and not their working. For the scope of this curriculum, we will be sticking with an in-depth understanding of derivatives with stocks, currencies, commodities, and indices.)*





## NIFTY50

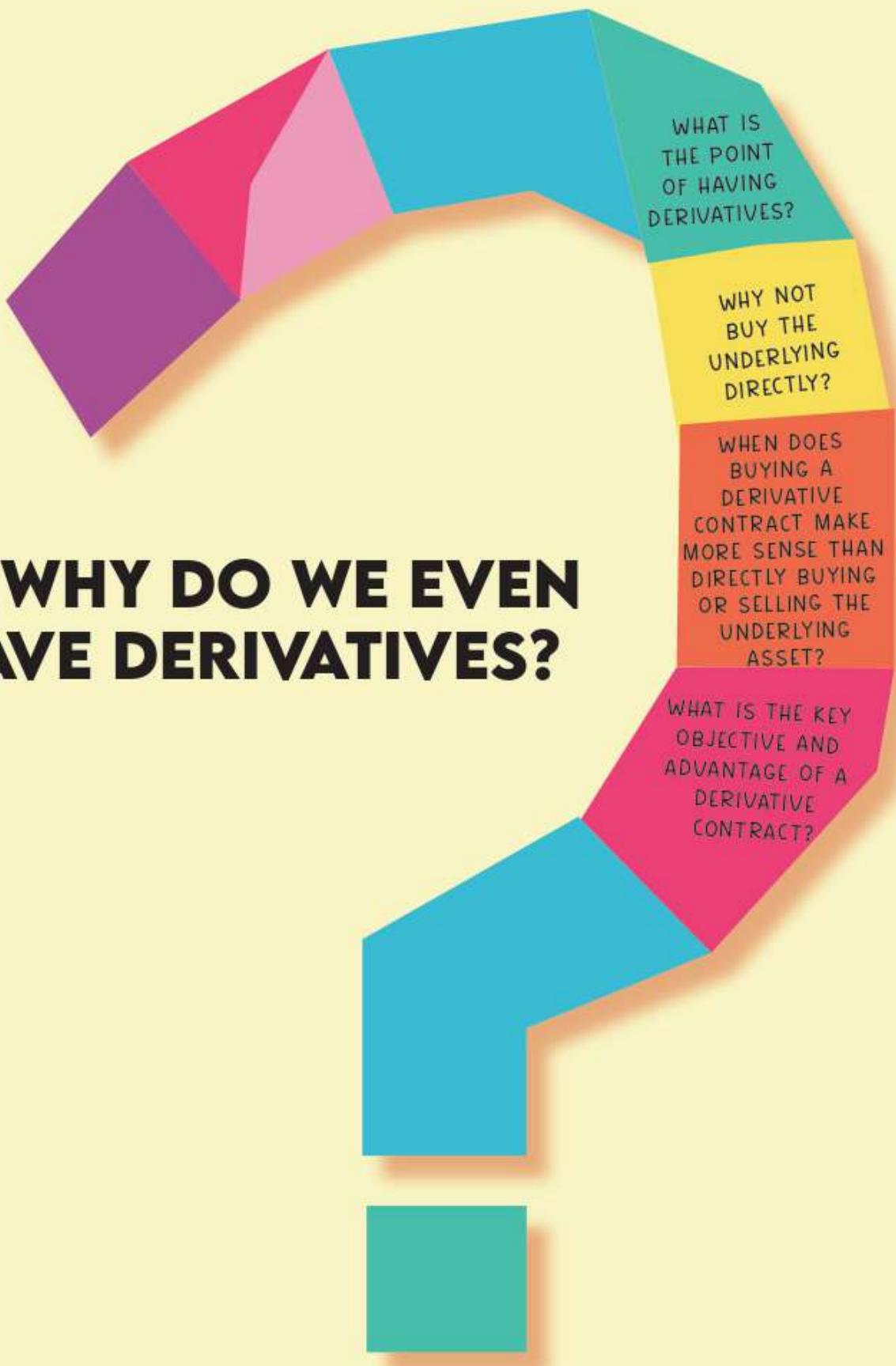


## NIFTY50 FUTURES

We will see that the movement of the underlying asset and the derivative is related. We will learn how different types of derivative contracts move differently based on the movement of the underlying asset prices. For instance, NIFTY and NIFTY Futures move in an identical manner.

Source: <https://in.tradingview.com/>

## 1.3 WHY DO WE EVEN HAVE DERIVATIVES?



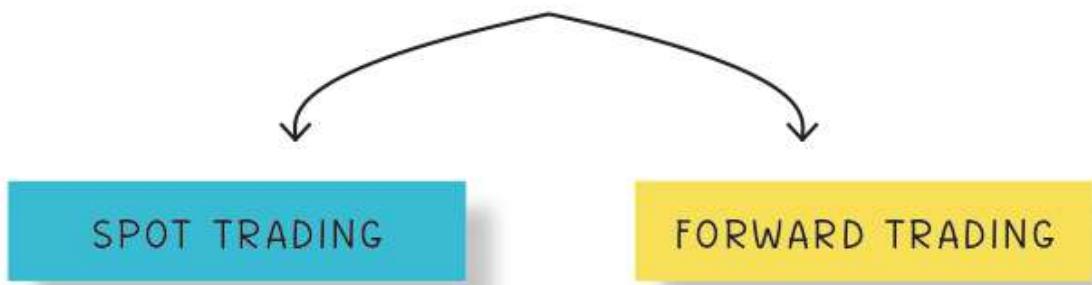
To answer the above questions, let us understand the difference between buying an asset through the spot market against buying the asset through a derivative contract i.e. Forward contract.

# 1.4 SPOT TRADING AND FORWARD TRADING

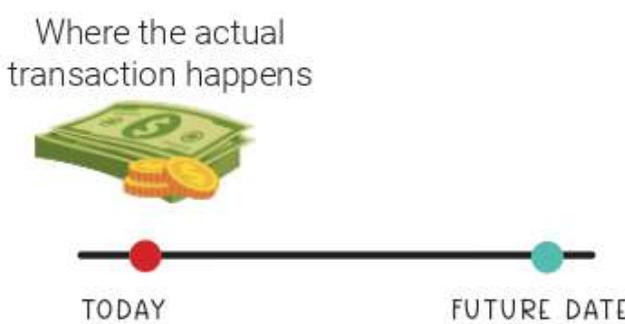
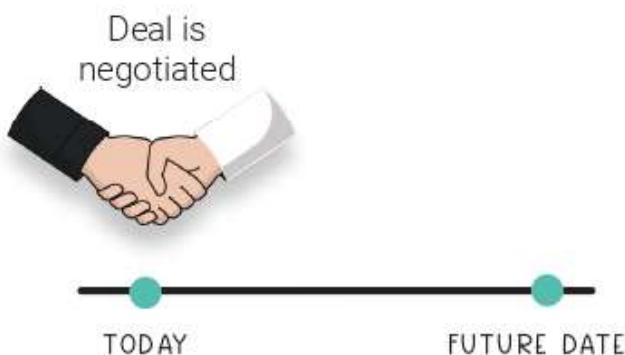


Explainer Video

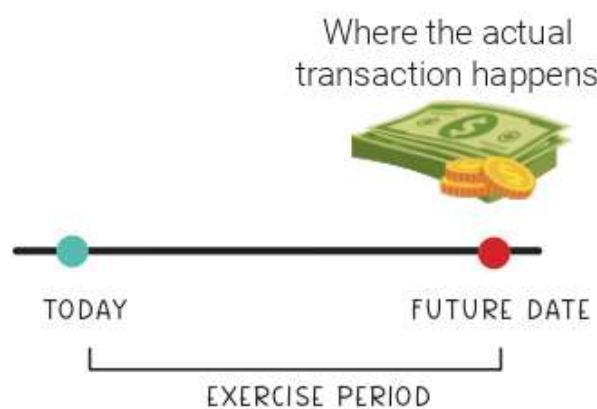
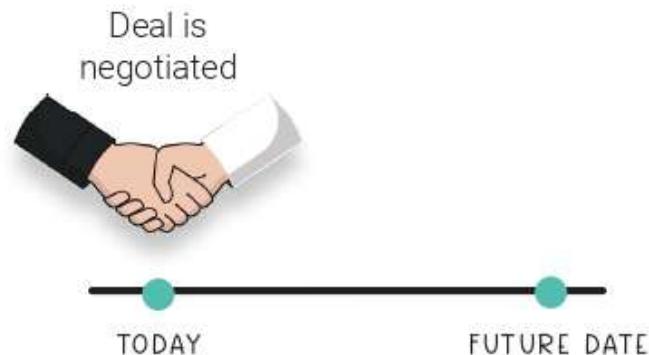
## WE CAN TRADE IN TWO WAYS:



**Spot Trading or Cash Trading** is when a purchase or sale is made directly and immediately from the market.

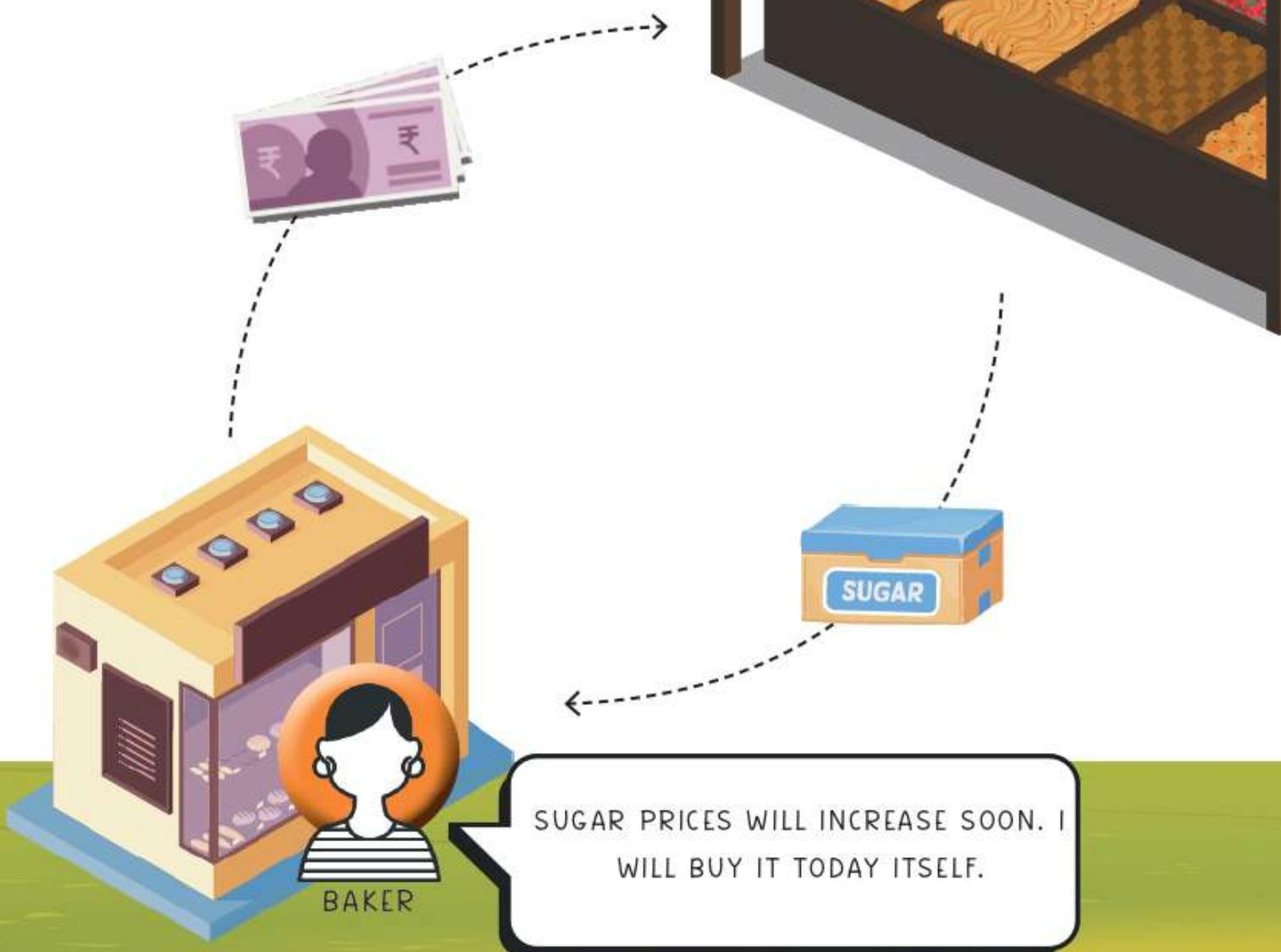


**Forward Trading** is where two parties agree to trade an asset at a future date, at a predetermined price.



## SPOT MARKET

**Now,** to buy the underlying asset at the spot - you have a pay-out of the total spot price today. Meaning, that if you have a bakery shop and you need sugar (a commodity, as a raw material), you buy sugar at the market price, in cash – the total amount, today to protect yourself against the fear of an increase in the price of sugar in future when you might need it.



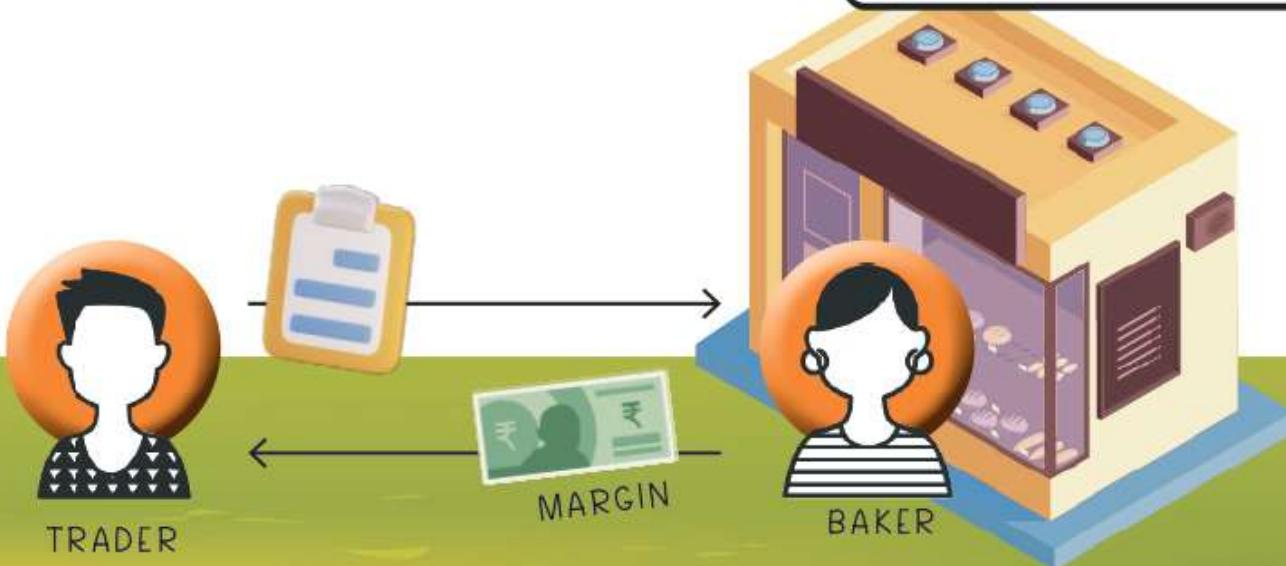
## FORWARD MARKET



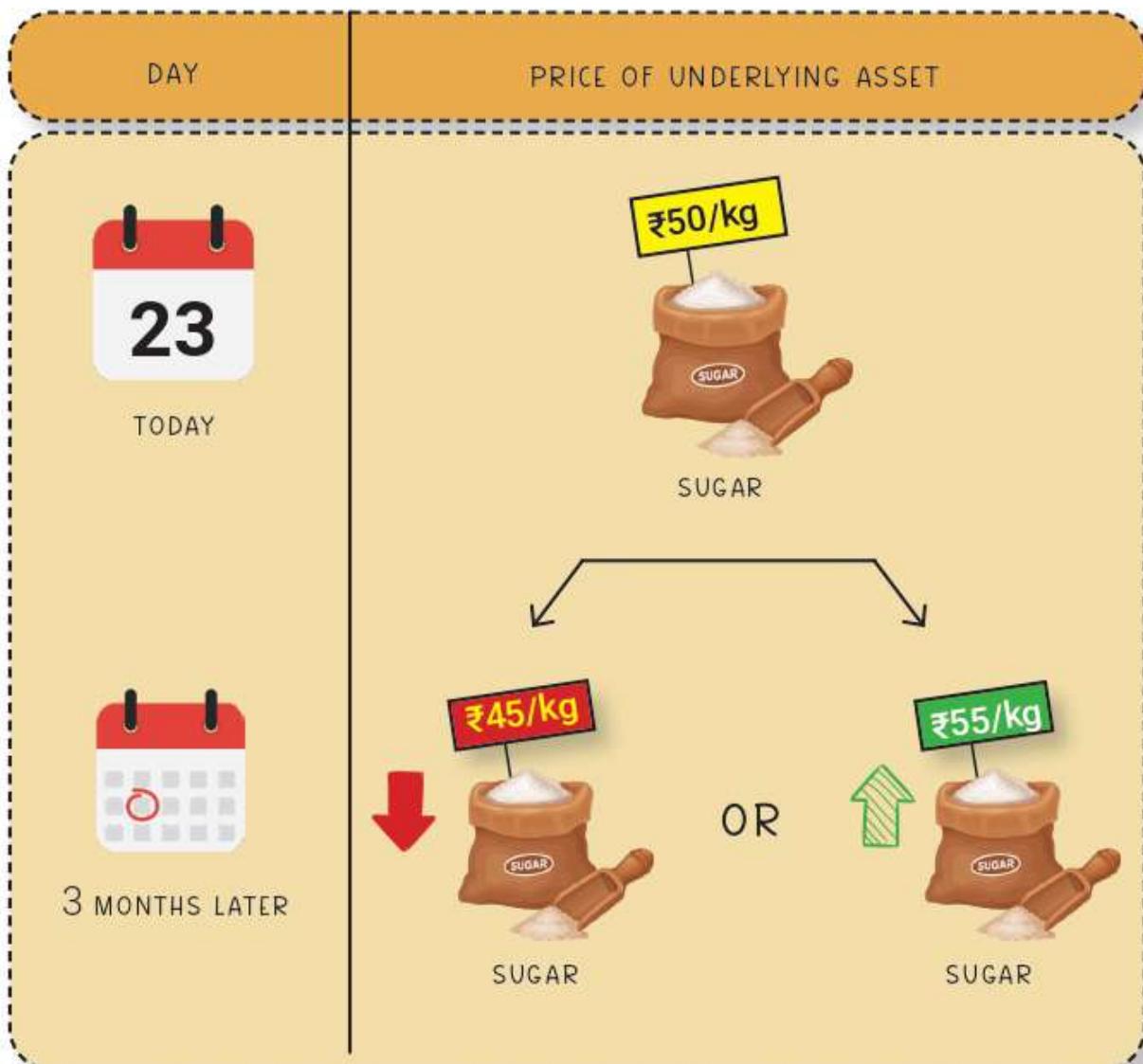
MARKET

**Alternatively,** buying the underlying asset through a forward makes you enter a contract (legally binding) to purchase the same underlying (commodity – sugar, in this case) at a predetermined price at a later date decided today. You might have to pay a small amount i.e. margin money while entering this forward contract (derivative). However, this amount will be much smaller than paying the entire amount. Also, you will get the Sugar at the pre-determined price irrespective, if the price increases or decreases in the future.

SUGAR PRICES WILL INCREASE,  
LET ME ENTER IN FORWARD  
CONTRACT SO MY PRICE IS  
LOCKED...



Purchasing the asset using a Forward contract at a predetermined price has further protected you against any price fluctuations (uncertainty) of the underlying asset (sugar).



BUYER

BUYER WILL GET THE SUGAR AT PREDETERMINED PRICE I.E. ₹50/kg 3 MONTHS LATER TOO DUE TO THE FORWARD CONTRACT.



Meaning that if the price of sugar after - 3 months is 10% more, you will still have the benefit of buying it at the predetermined price. Also, if the price of sugar after - 3 months is 10% less, you will still have to buy the sugar at the same predetermined price. Therefore, the derivative here plays a significant role in protecting you against any price fluctuations of sugar in the market. This is very important for those who have high exposure to such price fluctuations. It is important for them to purchase.

Now when you buy a commodity that you need after 3 months, you will also have to store it which will include some **storing costs**. When you buy using forward contracts, because you do not receive physical delivery, you do not have to incur any storage costs too.



This is how those who actually need the commodity use derivative contracts to manage and reduce their risks. However, from a trading point of view as well, we can enter trades and try to benefit from such derivative contracts. This is what we will discuss in this book and chapters coming ahead.

## SPOT TRADING VS FORWARD TRADING

### SPOT MARKET



FINANCIAL ASSETS ARE TRADED.

TRADE EXECUTED IMMEDIATELY.

ENTIRE AMOUNT NEEDS TO BE PAID UPFRONT. THE ENTIRE TRANSACTION IS CLOSED ON THE SPOT ITSELF WITH CASH AND ACTUAL GOODS EXCHANGING HANDS.

COMMERCIAL BANKS, BROKERS, CUSTOMERS OF COMMERCIAL BANKS AND BROKERS.

### FORWARD MARKET



THESE ARE MORE FINANCIAL CONTRACTS AND NOT ASSETS IN THEMSELVES.

EXECUTED ON A SPECIFIC FUTURE DATE.

ONLY MARGINS NEED TO BE PAID AT THE TIME OF ENTERING INTO THE CONTRACT.

HEDGERS, SPECULATORS, ARBITRAGEURS, MARGIN TRADERS. BEYOND THIS, THEY ARE COMMONLY USED TO MANAGE RISKS.

VS

# 1.5 PURPOSE OF DERIVATIVE

Derivatives are used for a varied range of purposes by different traders. Covering their uses, we have a simplified list for you below:



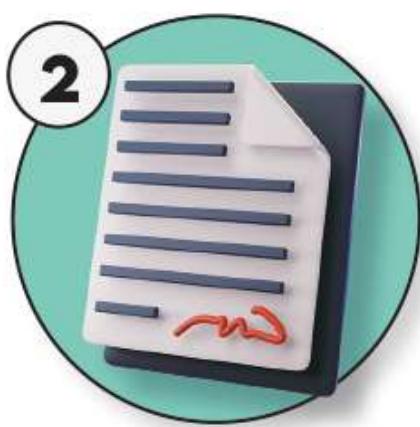
# 1.6 TYPES OF DERIVATIVES

Derivatives contracts are of different types. Each of these different type of derivative contracts has a different purpose. They differ in their construct, risk, reward, payoffs, terms and many more aspects. One needs to pick the correct type of derivative based on what asset class do they want to hedge or trade in.

## THE COMMON TYPES OF DERIVATIVES ARE:



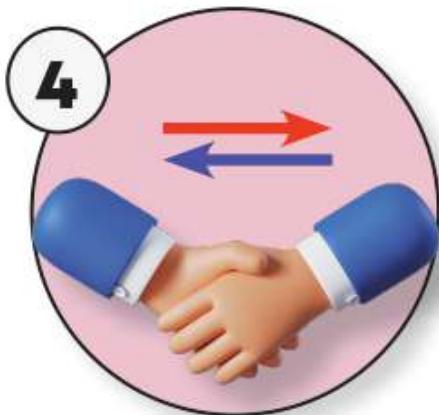
FORWARDS CONTRACT



FUTURES CONTRACT



OPTIONS



SWAPS

Although we have dedicated chapters, in this book, for each of these derivatives, let us quickly understand the basics of these kinds before we move further. Also, in this book, we will mainly focus on Futures and Options from a trading point of view and go in lot of detail for these.

## FORWARDS CONTRACT

Forward contracts are an agreement between a buyer and a seller to trade the underlying asset at a future date at a predetermined price. Here, the trade is to be executed in the future irrespective what the market price is on the pre-determined date. These are **not traded over exchange** i.e. we cannot buy forward contracts on BSE and NSE. These are to be done in person by finding a counter-part.



[Explainer Video](#)



## FUTURES CONTRACT

Futures contracts are an agreement to buy/sell an underlying asset at a future date decided today and at a predetermined price but these are **exchange-traded**. They work in a manner similar to Forward contracts except for the fact that they can be bought and sold over BSE and NSE. Also, these require daily settlement of profits and losses. We will learn more about these going ahead.



[Explainer Video](#)



Therefore, for each contract, there is a middle person, i.e., BSE or NSE, with whom the contract is done.

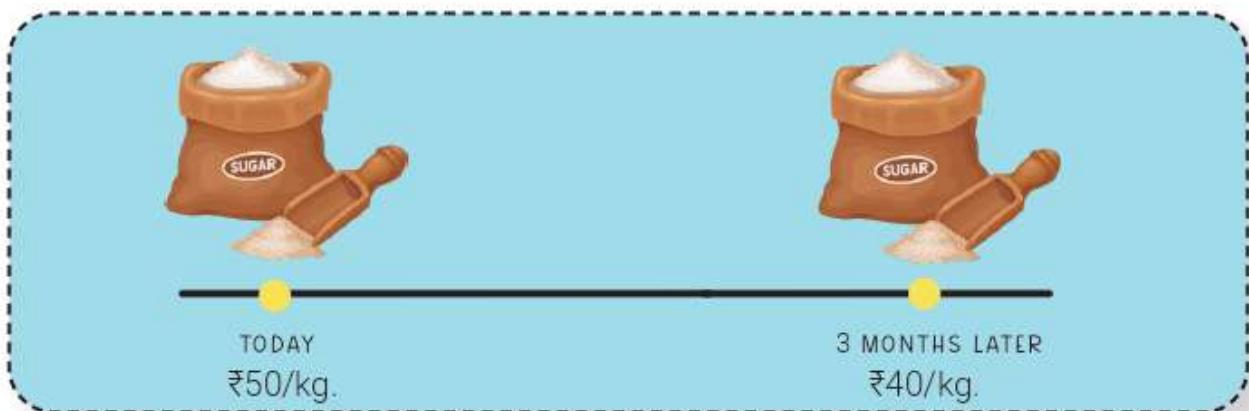
<input checked="" type="checkbox"/> FUTURE DATE	<input checked="" type="checkbox"/> PREDETERMINED PRICES	<input checked="" type="checkbox"/> EXCHANGE TRADED
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# OPTIONS

Options are, as by their name, an option or right to buy or sell an underlying asset at an agreed price in a specific period of time. This basically means that, a buyer can enter into a contract and exercise only if they are making profits from the same and let it go un-exercised if they are not making profits. Options are basically a contract where the buyer is not obligated to exercise the contracts.



Explainer Video



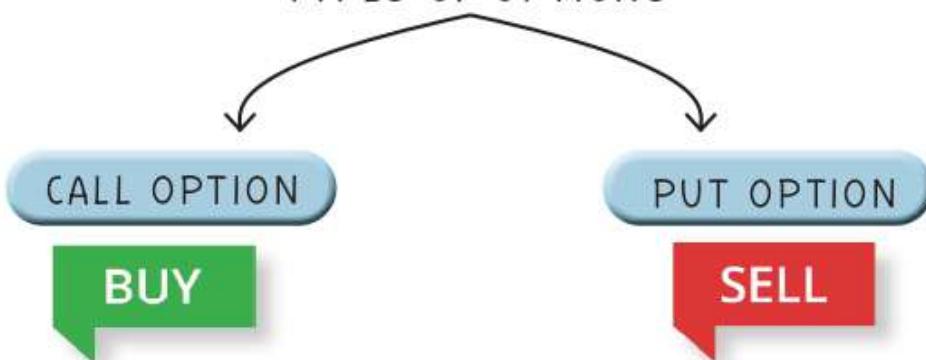
RIGHT

OBLIGATION

OPTION HOLDER HAS A RIGHT/ OPTION BUT NOT AN OBLIGATION TO BUY THE ASSET AT PREDETERMINED PRICE.

We will learn about how exactly options work in great detail in the chapter introducing Options. You do not need to understand the complete working right away. We will learn more going ahead.

## TYPES OF OPTIONS



In the Call Option, the buyer has the option/right - but not the obligation, to purchase the underlying asset at a fixed price. Here, the buyer profits when the price of the underlying asset goes up.

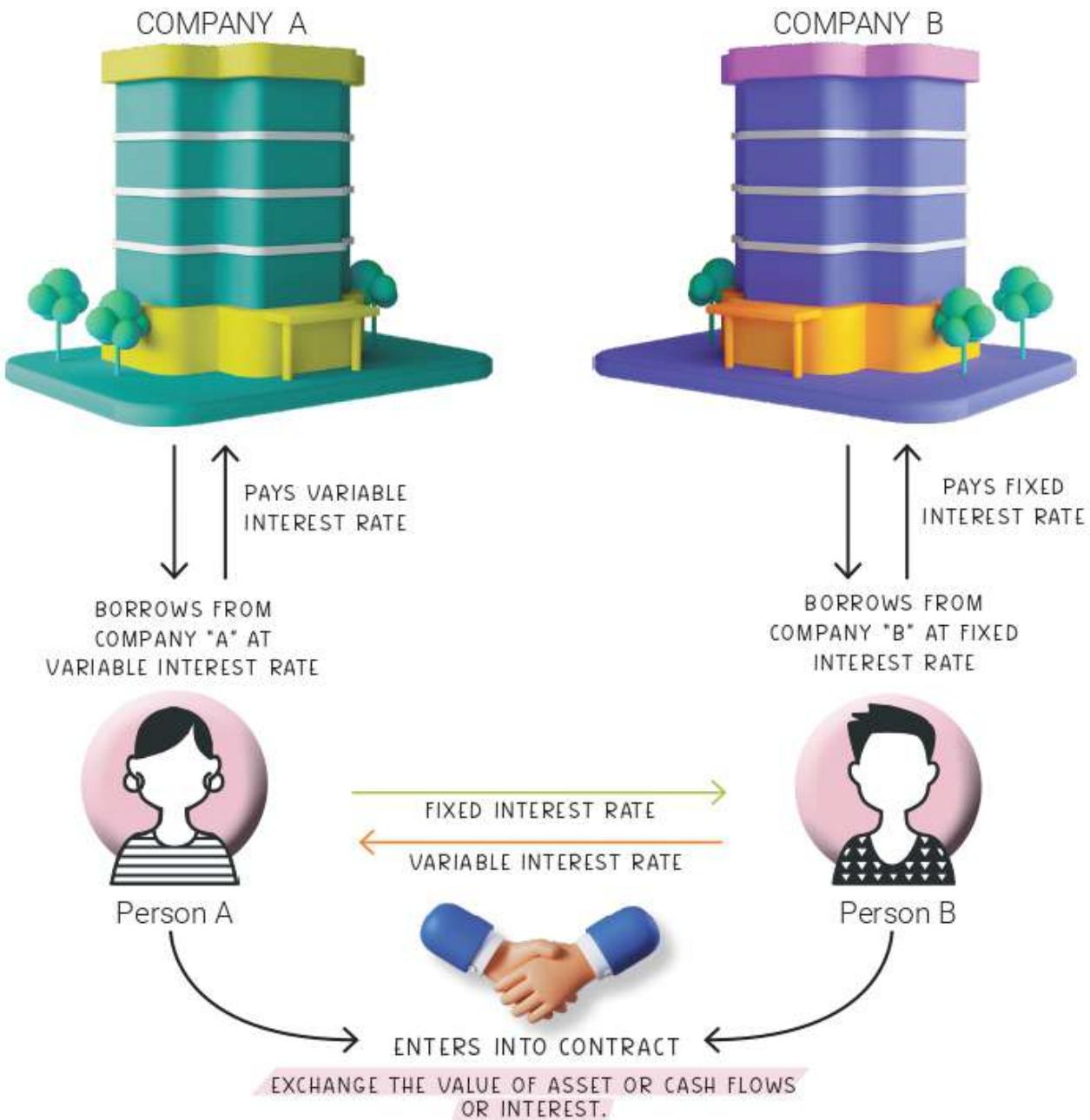
In the Put Option, the buyer has the option/right - but not the obligation, to sell the underlying asset at a fixed price. Here, the buyer of the Put option profits when the price of underlying asset goes down. We will understand this in great detail going ahead.

# SWAPS



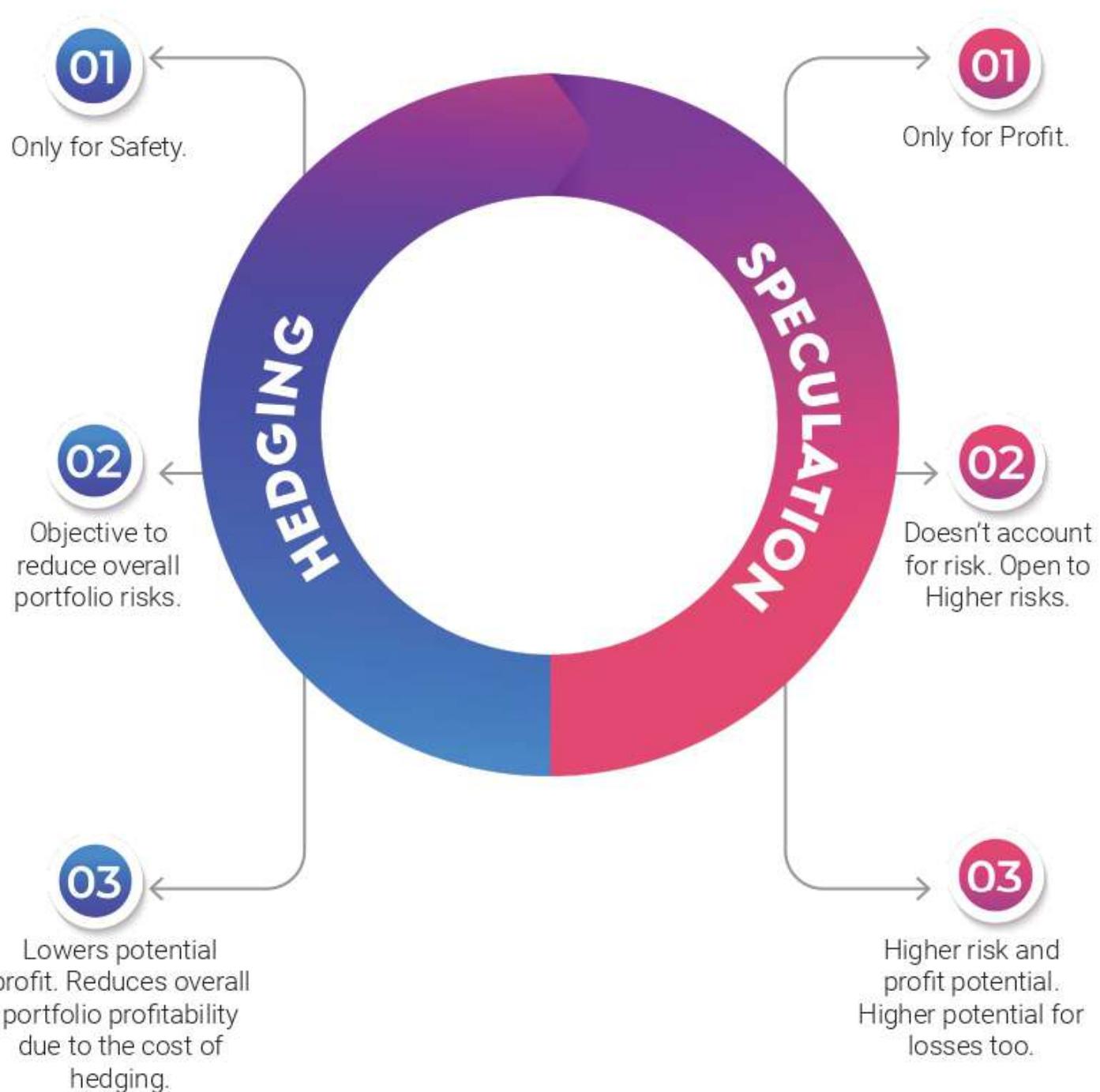
Explainer Video

Swaps contracts are one of the most complex ones. These are, to a great degree, used by - large corporations and financial institutions. Swaps are when two parties exchange their liabilities on agreed terms and then the change in value of the liability is their profit or loss.



**Here for example,** person B had to pay Fixed Interest rate to Company B. However, after the swap they have to pay Variable Interest Rate. Now imagine if the interest rate in the economy goes down. Without the swap they would still be paying a fixed rate but after the swap they would have to pay a reduced rate of interest. The vice versa is true with if the interest rate goes up as well. In that case person B would incur losses due to the Swap arrangement. This is how Swaps work on interest rates. Swaps are traded over the counters and not over the Exchanges i.e. not over BSE and NSE. They are customized - per the unique requirements of the parties involved in the contract.

# 1.8 HEDGING VS SPECULATION



# Notes

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## 1.7 WHO USES DERIVATIVES?

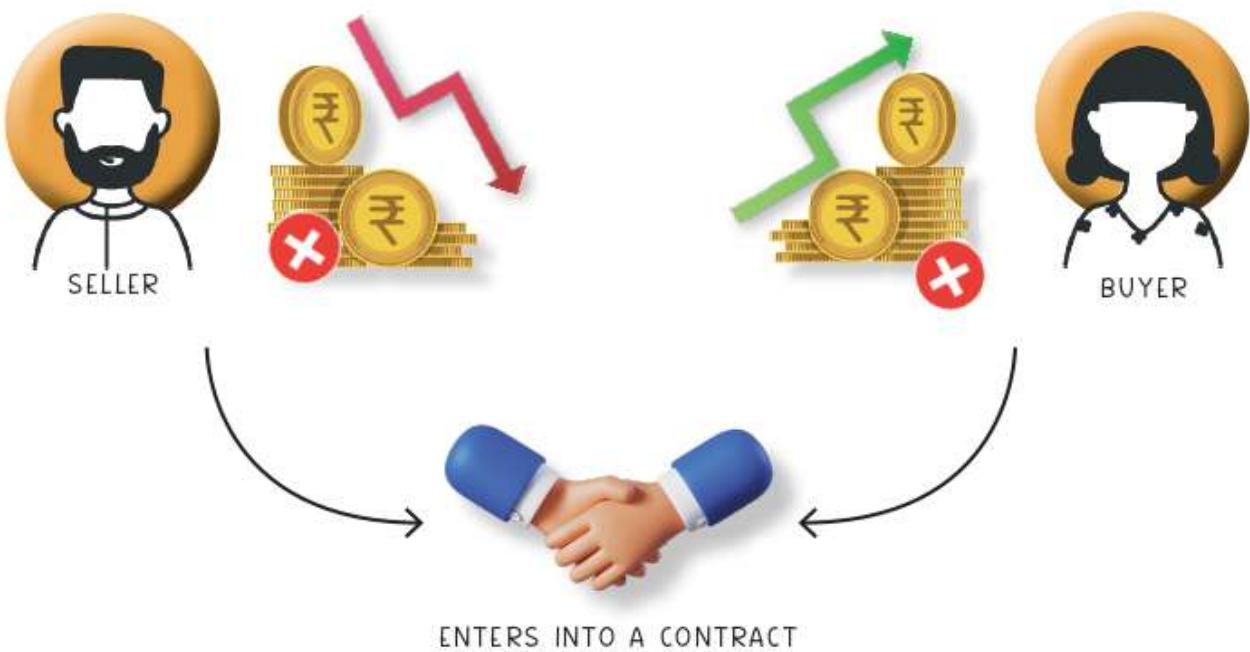


## WHO ARE HEDGERS?

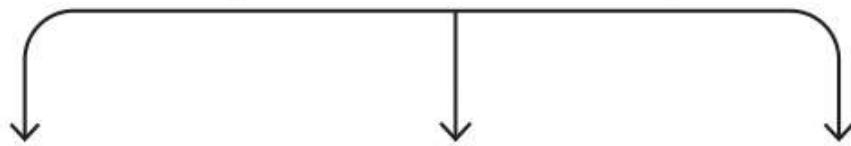
Hedgers, as the name suggests, are traders that want protection against the risk of price movement or price uncertainty that is not in their favor. The primary motive here is not to profit from the derivative contracts but reduce the risk of major losses due to change in prices.

**For instance**, a sugar seller would not want the price of sugar to fall and therefore is looking to hedge/protect herself against a major price drop in the future.

On the other hand, a sugar buyer (say for bakery raw material) would not want the price of sugar to rise and therefore is willing to hedge himself against the price rise in the future.



Both are willing to enter a forward contract (derivative) to



LOCK THE PRICE AT A  
MUTUALLY PREDETERMINED  
AMOUNT

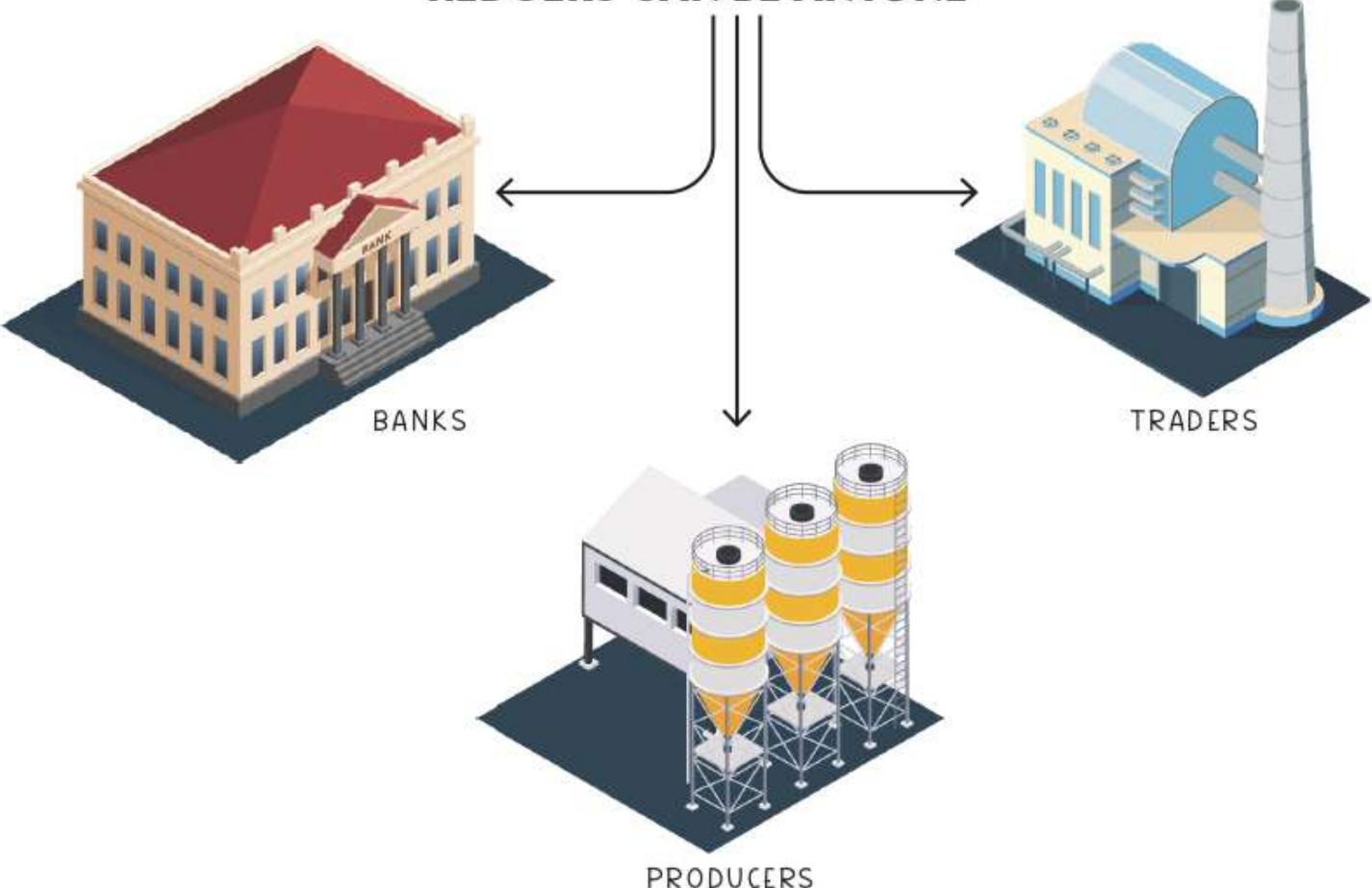
QUANTITY TO BE  
SOLD

AT A PREDEFINED FUTURE  
DATE, DECIDED TODAY.

In financial markets, hedging is an activity undertaken to reduce overall portfolio risk that a company may have. For example, a portfolio that has lot of shares linked directly to movement of Crude oil might want to hedge it using derivative contracts. Banks might want to reduce interest rate exposures in uncertain times. The idea here is to not make profits from derivatives but to avoid large losses that they might otherwise face. They are seeking safety and protection by entering this contract and are therefore called **Hedgers**.



### HEDGERS CAN BE ANYONE



BANKS

TRADERS

PRODUCERS

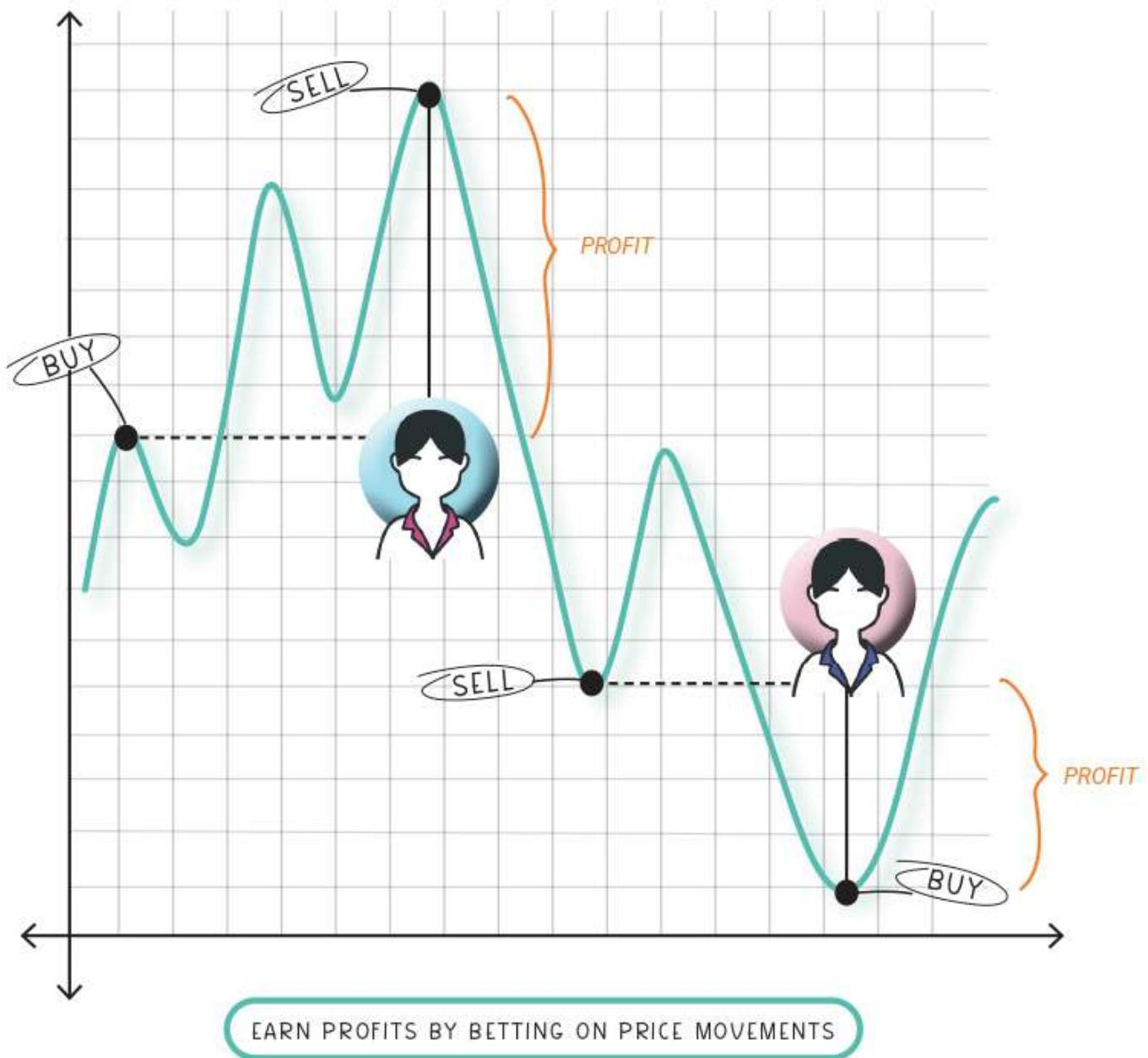
As per the fundamental rule of finance -

HIGHER THE RISK, HIGHER IS THE REWARD.

With hedging, the person is trying to reduce risk and as a result will have to let go of some of the profits that they might have made without the hedge. Hedgers are not concerned with profitability when it comes to derivatives- related transactions.

## WHO ARE SPECULATORS?

Speculators, as the name suggests, are individuals that take on additional risk to profit from the market movements using derivative contracts. They are looking for opportunities to profit from. Profit making is the main objective here.



Most traders fall in this category. They are not looking for hedges for their main portfolio. They are actively looking to earn using their trading strategies.

## WHO ARE ARBITRAGEURS?

Arbitrageurs are people who keep a close watch on the price discrepancies in the market for an asset. Arbitrage opportunities basically means that there is a market inefficiency that is there to benefit from. However, arbitrage opportunities are difficult to spot in general. Let us understand arbitrage using a simple example.

**For instance**, let us say the price of 1 kg tomatoes in your Market A is ₹50

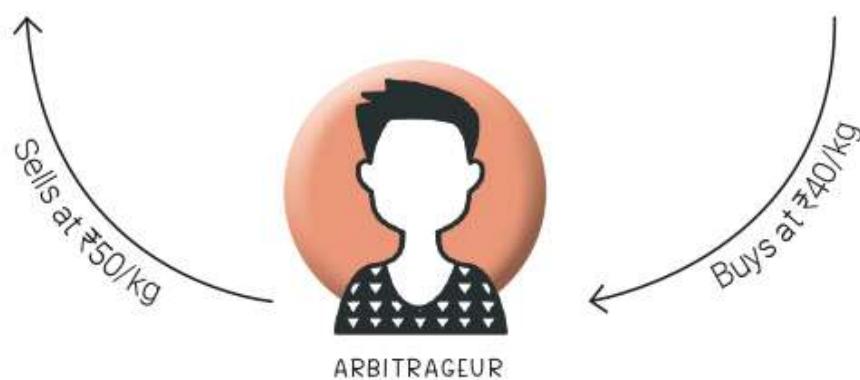


MARKET A



MARKET B

And the price of the same 1 kg tomatoes in your friend's area i.e. Market B is ₹40.



Here as an arbitrageur, you may see an opportunity to buy from Market B and sell in Market A at a profit of ₹10 per kg .



In theory, arbitrage opportunities are risk-less i.e. they have no risk involved. Here similar assets are bought and sold in different markets at the same time. Here the trader tries to benefit from such differences.

## **CHAPTER 2**

# **FUNDAMENTALS OF FORWARD CONTRACTS**

- 2.1 Introduction**
- 2.2 What happens on the date of settlement?**
- 2.3 What is forward contract ?**
- 2.4 Conclusion**

## 2.1 INTRODUCTION

“

”

FORWARD CONTRACTS ARE AN AGREEMENT OR CONTRACT TO BUY OR SELL AN ASSET AT A SPECIFIC PRICE FOR A SPECIFIC QUANTITY ON A SPECIFIC FUTURE DATE.



FUTURE DATE



SPECIFIC PRICE



SPECIFIC QUANTITY

These contracts are customized - as per the requirements of the two parties involved in the agreement. The flexibility of customizing the contract means that it is not standardised for all.



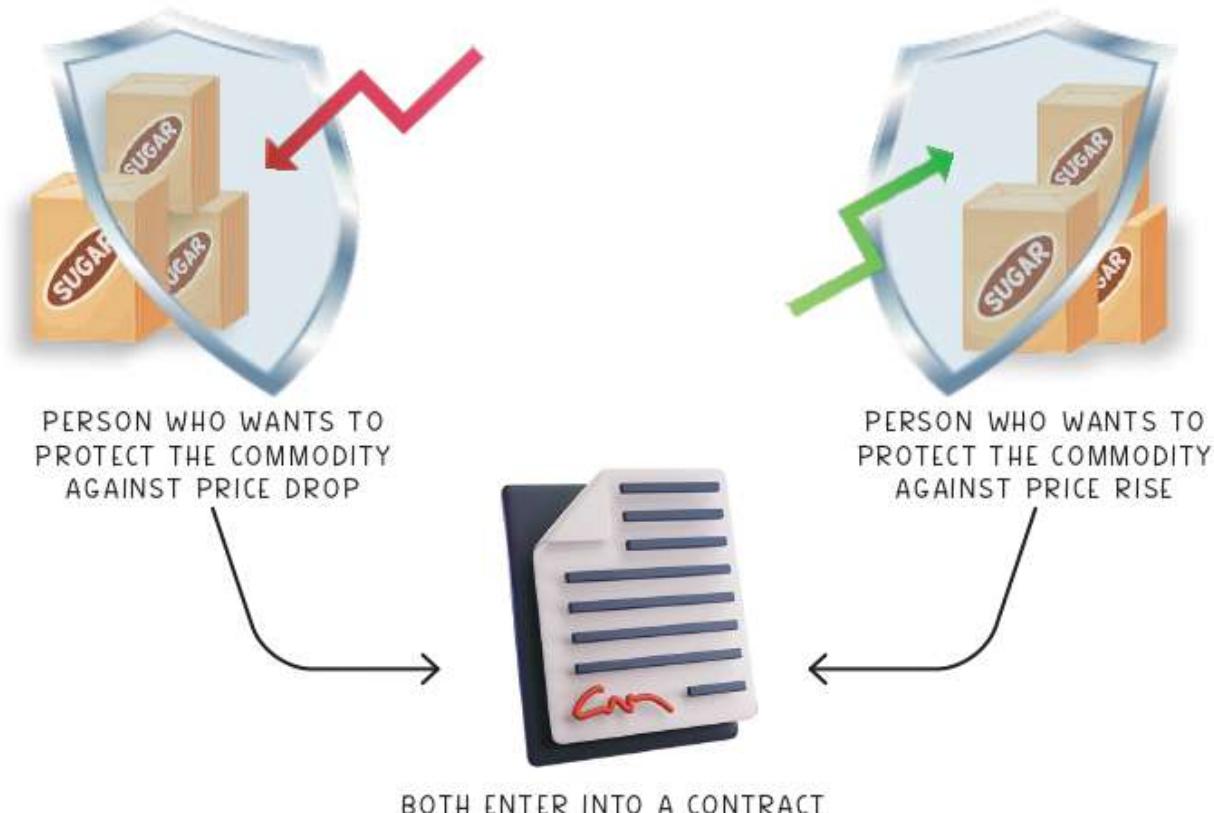
CUSTOMIZED

STANDARDISED

Since it is not standardised, it is an over-the-counter (OTC) contract. It means forward contracts are not exchange-traded contracts. Hence, they are unregulated by SEBI – Securities and Exchange Board of India. These contracts do not have a market as such. Two parties manually meet and agree to have this contract.



So, if you want to hedge against a price drop for a commodity, you will have to manually find someone who wants to hedge themselves against a price rise in the future of the same item.



Then, you two shall mutually agree upon a specific quantity, price, and physical delivery date to enter this contract. And vice versa. There is **no middle man or third party** involved to regulate all this.

## 2.2 WHAT HAPPENS ON THE DATE OF SETTLEMENT?

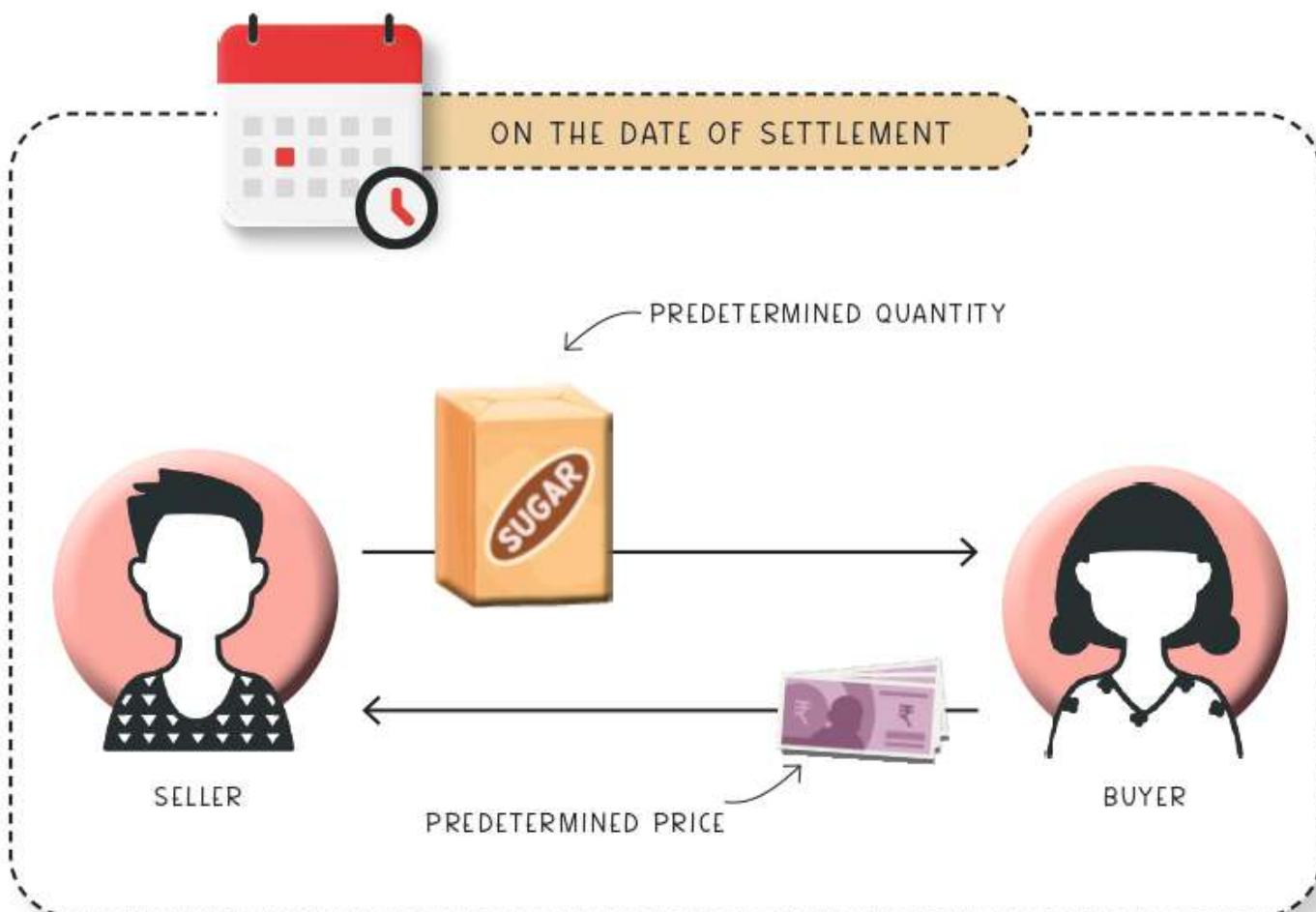
Forward Contracts Settlement can be done in either of these two ways:

1

**ACTUAL DELIVERY/PHYSICAL DELIVERY OF THE ASSET.**



In actual or physical delivery of the asset, the contract is executed as it is. On the date of delivery, the asset (say sugar) is delivered and the payment, as agreed upon, is made.

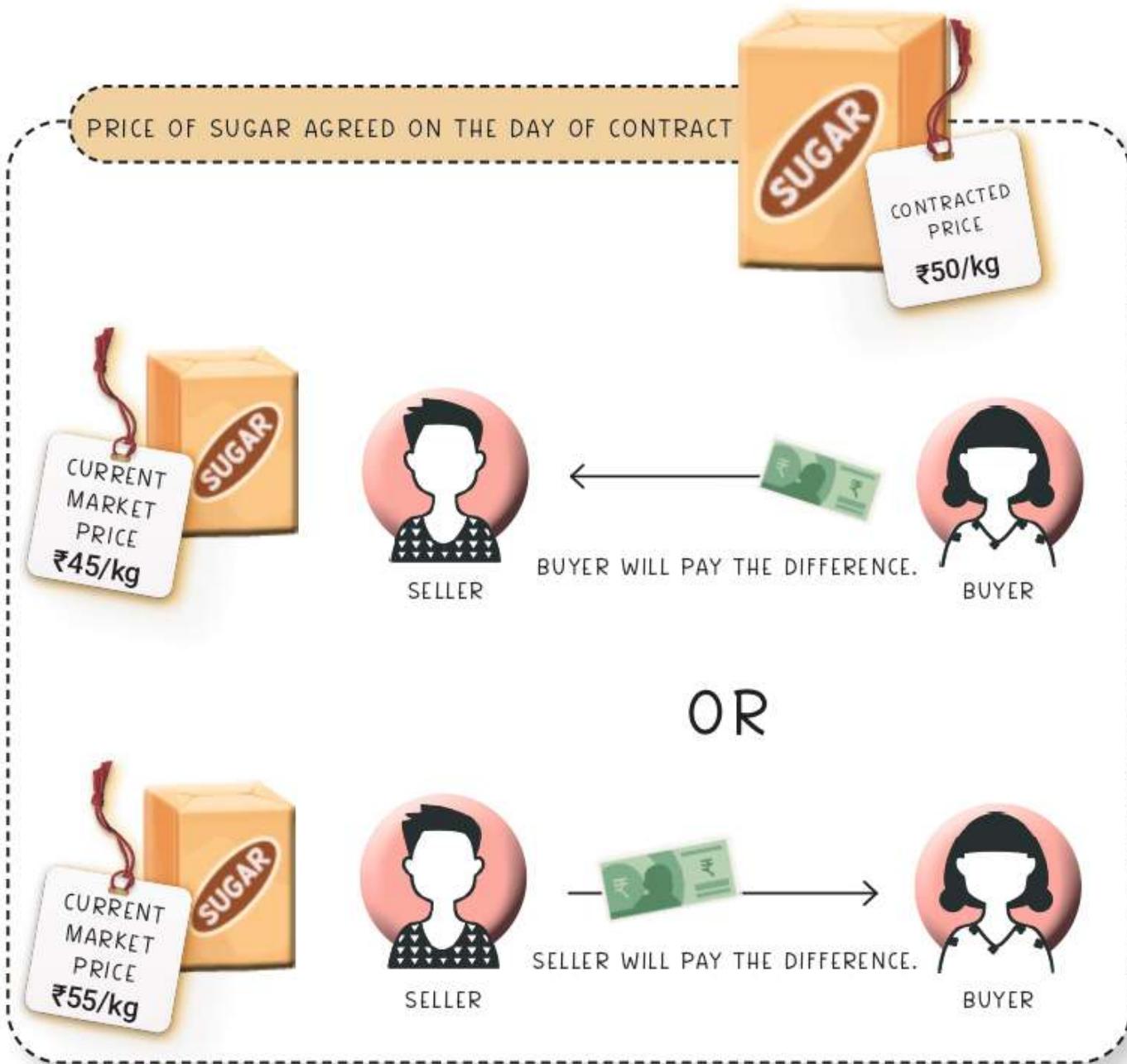


2

## PAY THE DIFFERENCE.



In pay the difference, the price of the asset, as agreed upon in the contract, is compared with the current price of the asset in the market. Based on the difference in the two prices, whosoever is in profit is compensated by the other party.



## 2.3 WHAT IS FORWARD CONTRACT ?

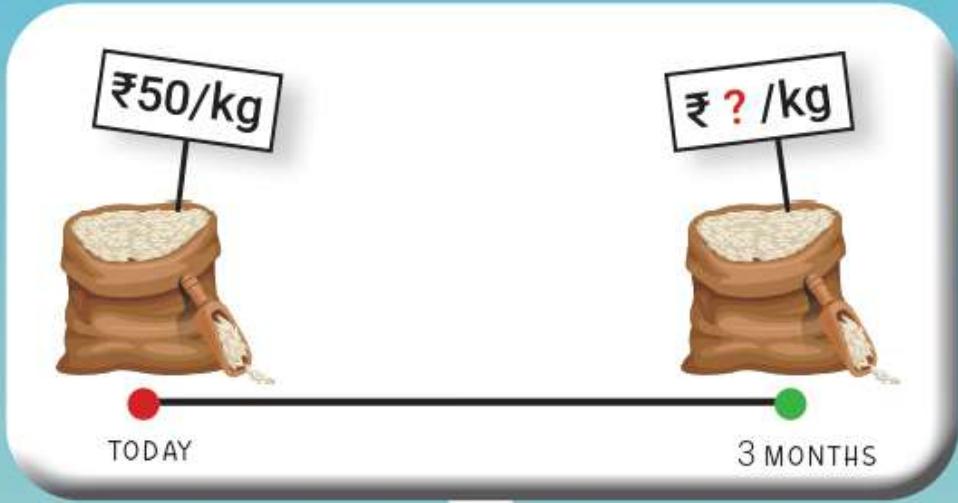
Let us understand this whole working of a forward contract with a practical example.

**Imagine** you are a farmer growing wheat on your farm. Now, there is a fair probability that by the time your crop is ready to be sold (say 3 months from today) the price might go down from its current rate of ₹50/kg. As a farmer, you do not want that. You cannot or do not wish to take the risk of price uncertainty in the market. You are afraid that you might have to sell your wheat at a lower price as you predict that the price is going to fall.



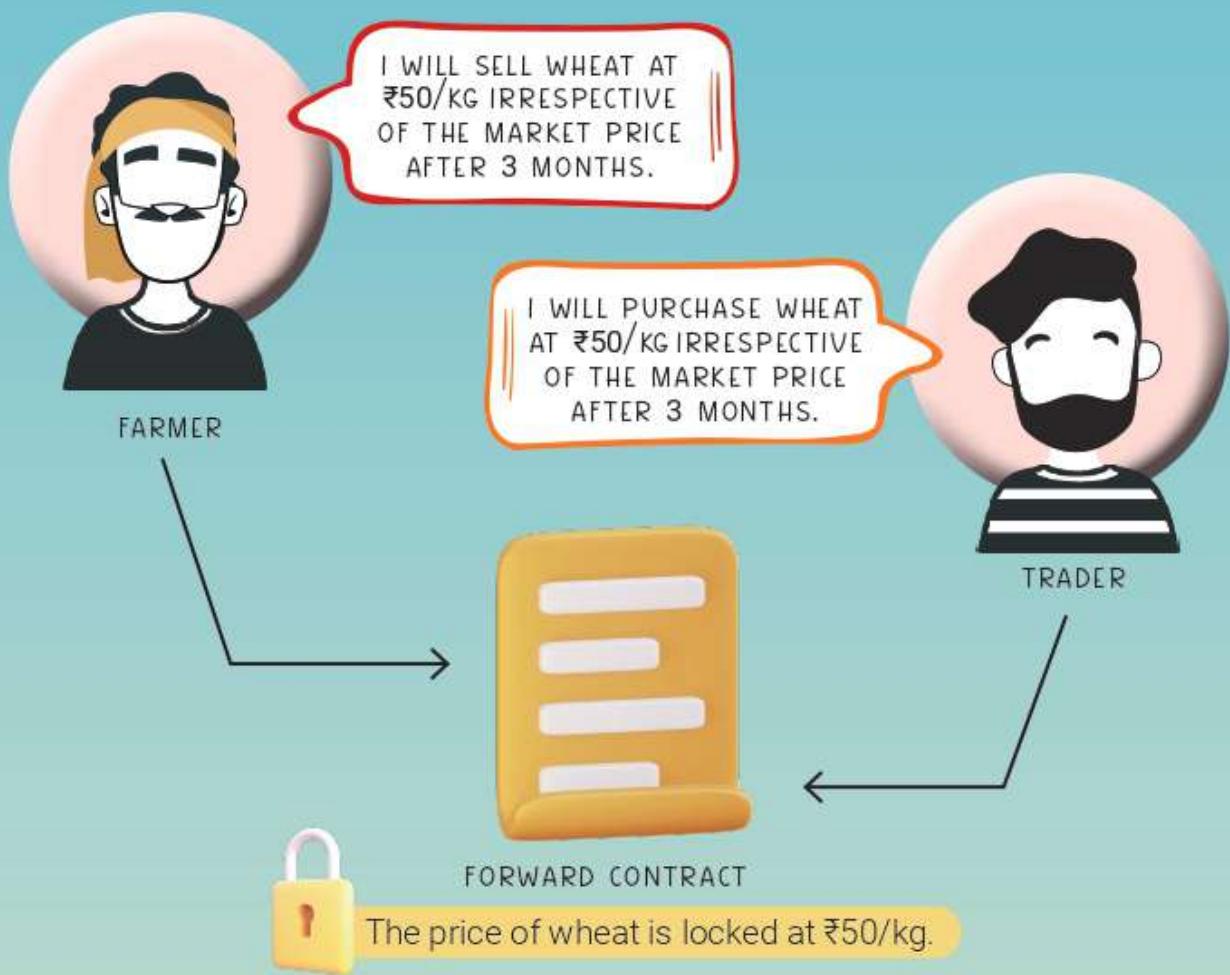
You know a friend, Sam (trader), who has a store where he sells wheat. This friend of yours is afraid that the price of wheat in the market after 3 months might go up.





BOTH FARMER AND TRADER WANT TO HEDGE THEMSELVES AGAINST THE UNCERTAINTY OF PRICE.

Both of you agree upon solving this fear of price uncertainty by entering a forward contract with each other.



You both lock the price of wheat on a mutually agreed price : ₹50/kg. As per this contract, after 3 months, you agree to sell your entire wheat grown (quantity agreed mutually) to your friend Sam at ₹50 per kg and Sam agrees to purchase your entire wheat at ₹50 per kg.

This is how both parties can reduce risks. Now at the time of transaction, one party will profit and other will incur losses. However, both parties win as the overall risk and uncertainty is reduced.

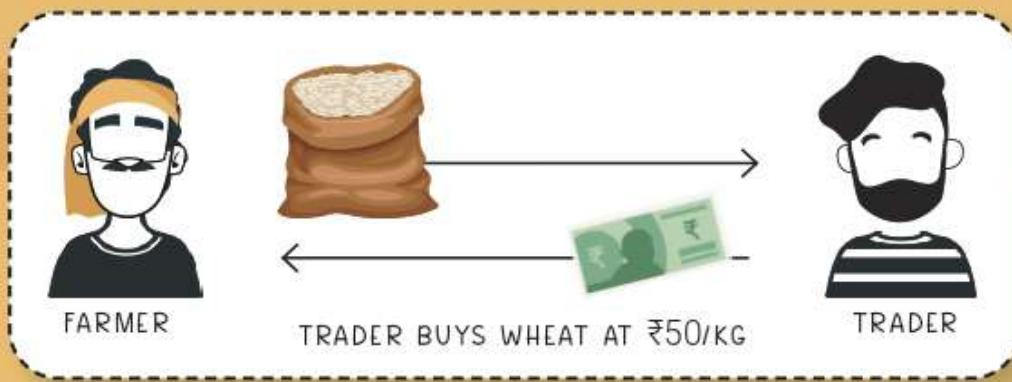


## WHAT IF THE PRICE GOES DOWN?

### ACTUAL DELIVERY OF ITEMS

3 MONTHS FROM  
NOW  
PRICE OF WHEAT  
₹45/kg

You go to your friend Sam's store to physically deliver the wheat at ₹50/kg. Sam honours the agreement, buys the wheat at ₹50/kg, makes the payment, and sells the wheat in the market at a loss of ₹5/kg.

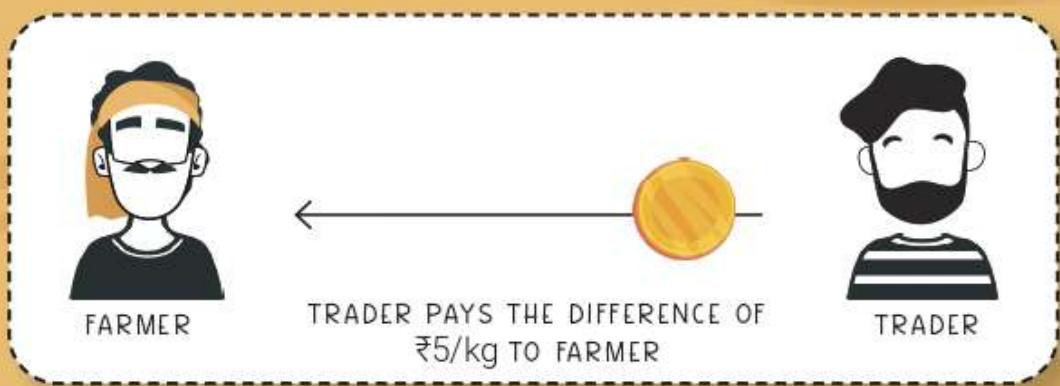


TRADER SELLS WHEAT IN THE  
MARKET FOR ₹45/KG AND  
MAKES A LOSS OF ₹5/KG



### PAYING THE DIFFERENCE

Sam calls you and says that you need not come to deliver the wheat, I am sending you the difference amount of ₹5/kg to settle the agreement.

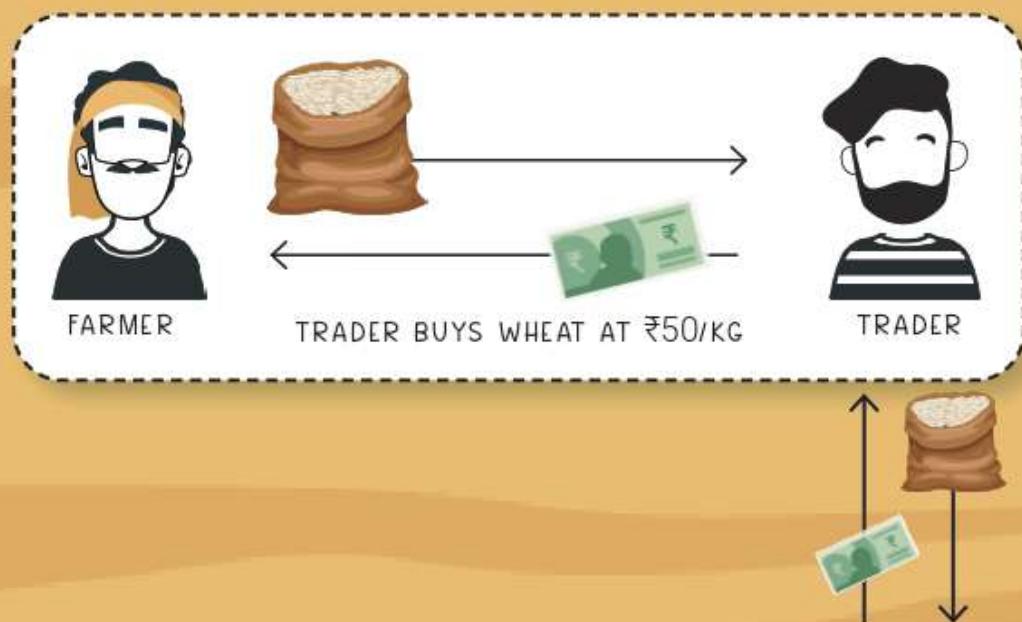


## WHAT IF THE PRICE GOES UP?

### ACTUAL DELIVERY OF ITEMS



You go to your friend Sam's store to physically deliver the wheat at ₹50/kg. Sam honours the agreement, buys the wheat at ₹50/kg, makes the payment, and sells the wheat in the market at a loss of ₹5/kg.



### PAYING THE DIFFERENCE

Sam calls you and says that you need not come to deliver the wheat, he is sending someone to collect ₹4/kg from you.



## WHAT IF ONE PARTY DEFAULTS?

Sam ghosts you and later refuses to honour the agreement of purchasing wheat from you at ₹50/kg. Since he can buy the wheat from the market at a lower rate, he dishonours the contract with you.



TRADER DISHONOURS THE CONTRACT

In a forward contract, no regulator is involved to ensure the agreement is honoured by the two parties involved. It creates room for **counterparty default risk**.

Although the contract is legally binding, the legal proceedings following the default may be very time-consuming and expensive.

## EXPECTATION

Trader purchases wheat from the farmer at ₹50/kg as per the forward contract.



## REALITY

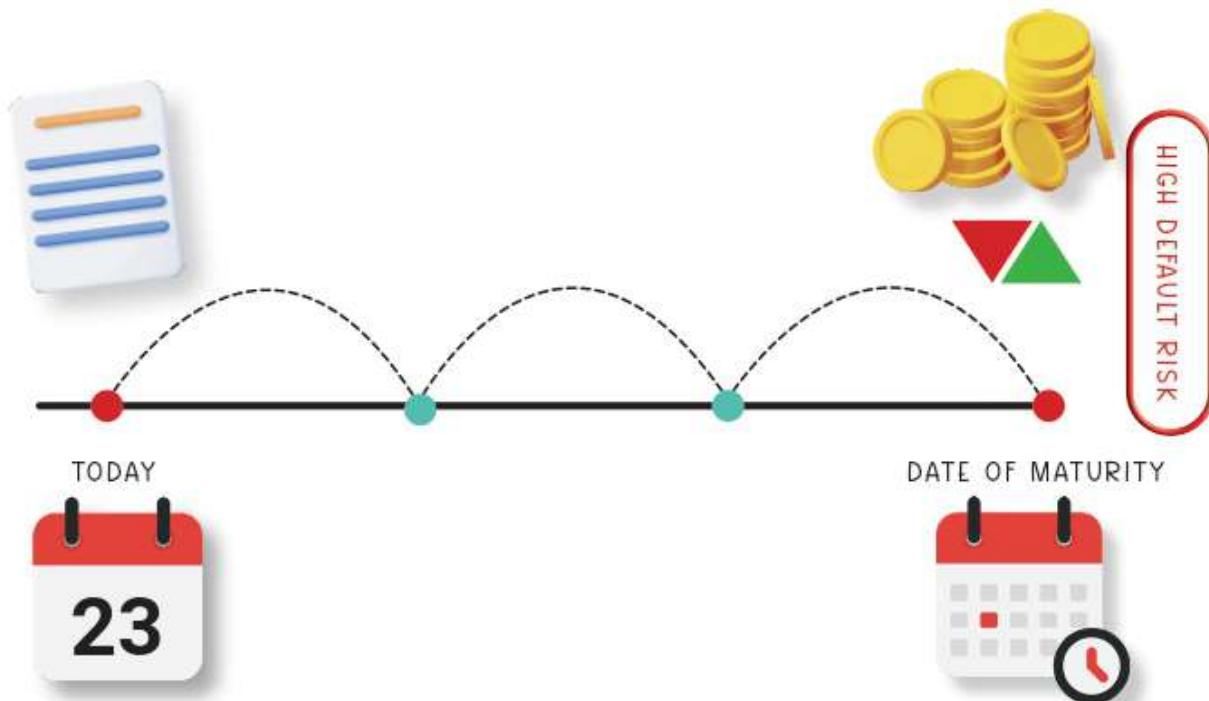
Trader purchases the wheat from the market at ₹45/kg and refuses to honour the contract with the farmer.



“ COUNTERPARTY DEFAULT RISK MEANS THAT THE PARTICIPANT WHO ENDS UP HAVING A LOSS AT THE END OF THE CONTRACT MIGHT REFUSE TO HONOUR THE AGREEMENT AND HENCE DEFAULT. ”

## 2.4 CONCLUSION

Forward contracts are a widely used derivative in over-the-counter practices. These are mainly used for commodity assets as physical delivery is possible in these contracts.

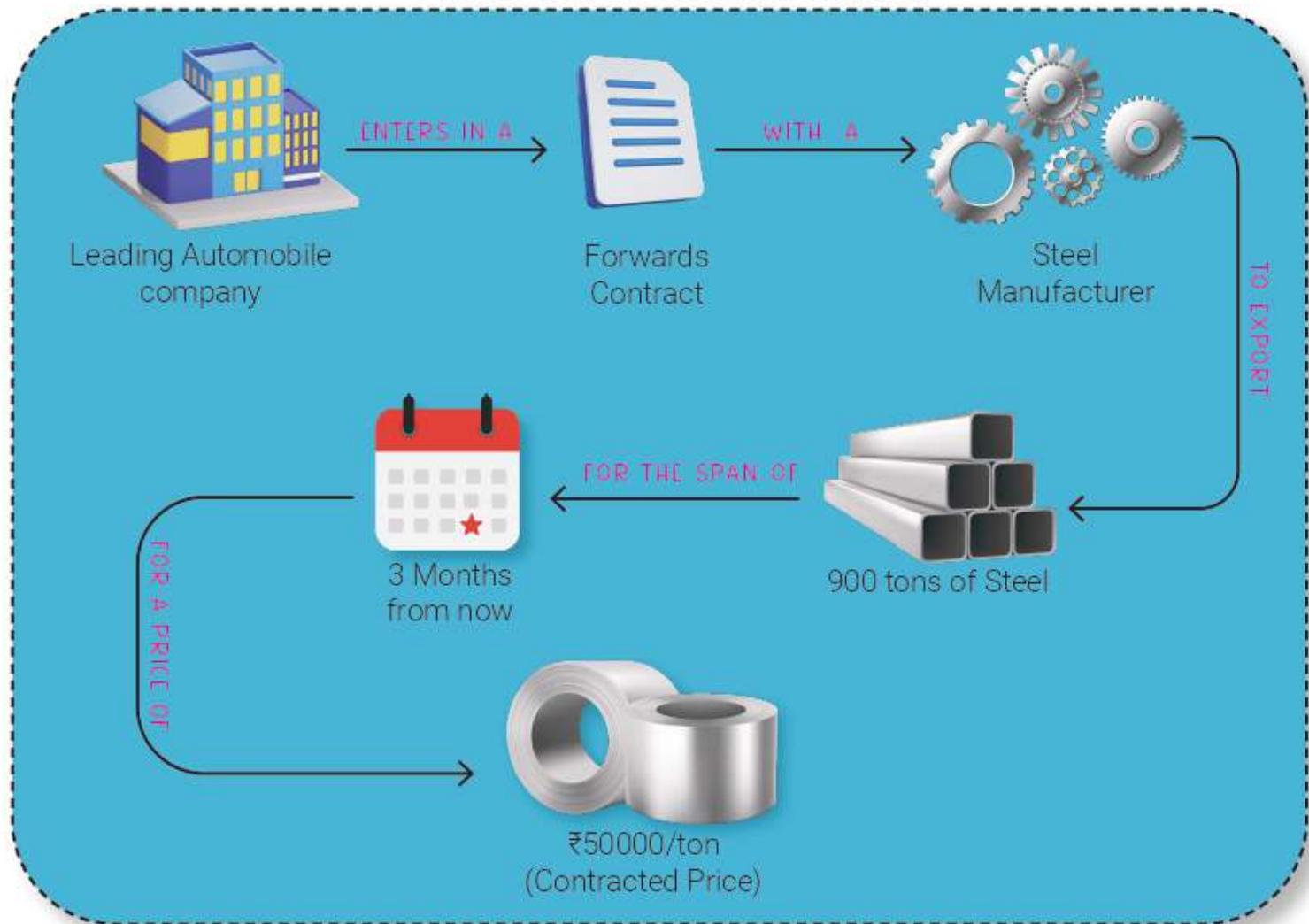


However, due to the lack of a reliable counterparty risk assurance, these contracts can be problematic for the profit-making party at the expiry. Since, in a forward contract, the profit or loss is accumulated to the date of maturity of the contract, therefore, the default risk involved is immense.

Therefore one must be careful about the counter-party when entering any forward contracts. They must be trusted parties who have a track record of meeting such liabilities.

# SUMMING IT UP

## Process of a Forward Contract



### POSSIBLE OUTCOME 1

CURRENT MARKET PRICE CONTRACT PRICE

The automobile company will incur a loss as they will have to pay a higher amount than the current market price. However, doing so, it has ensured uninterrupted supplies for itself.

### POSSIBLE OUTCOME 2

CURRENT MARKET PRICE CONTRACT PRICE

The automobile company will make a profit for itself as they can secure the supplies at a cheaper price. The steel manufacturer will incur a loss.

### POSSIBLE OUTCOME 3

CURRENT MARKET PRICE = CONTRACT PRICE

Zero potential profit or loss to both parties.

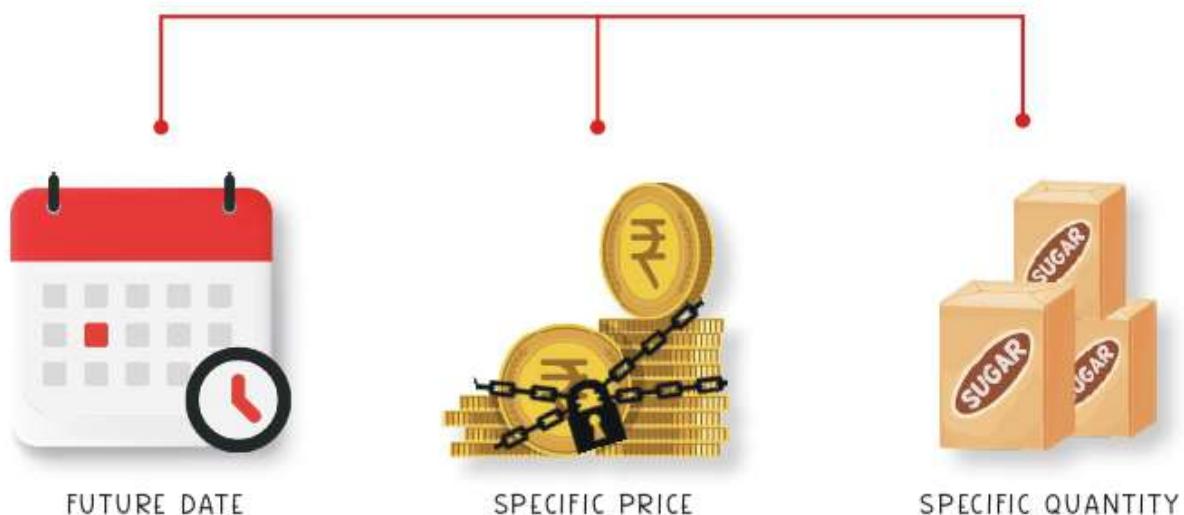
## **CHAPTER 3**

# **FUNDAMENTALS OF FUTURES CONTRACTS**

- 3.1 Introduction
- 3.2 What happens on the date of settlement?
- 3.3 Important terms to understand Futures
- 3.4 Difference between Long and Short position
- 3.5 Features of futures contract
- 3.6 What does a futures contract quotation look like?
- 3.7 Working of Futures Contract
- 3.8 What does mark to market mean?
- 3.9 Different Futures Contracts
- 3.10 Reasons for difference between Spot price and Futures price
- 3.11 Does the market converge to spot price = futures price ?
- 3.12 Conclusion

## 3.1 INTRODUCTION

FUTURES CONTRACTS ARE AGREEMENTS THAT CREATE THE OBLIGATION TO BUY OR SELL AN ASSET AT AN AGREED-UPON PRICE FOR A SPECIFIC QUANTITY ON A FUTURE DATE SPECIFIED TODAY.



- STANDARDISED
- CUSTOMISED
- EXCHANGE TRADED
- OVER THE COUNTER
- REGULATED BY SEBI

These are typically exchange-traded contracts, regulated by SEBI – Securities and Exchange Board of India. We buy or sell these via the Exchange, i.e., BSE or NSE and SEBI keeps a close watch on proper execution, fair practice and regulations.



FUTURES CONTRACTS ARE STANDARDISED BY BSE OR NSE, WHEREVER YOU BUY OR SELL THEM.

THE REGULATED OVER THE EXCHANGE NATURE OF FUTURES GIVE IT AN UPPER HAND OVER FORWARDS BY REMOVING COUNTER-PARTY RISKS.

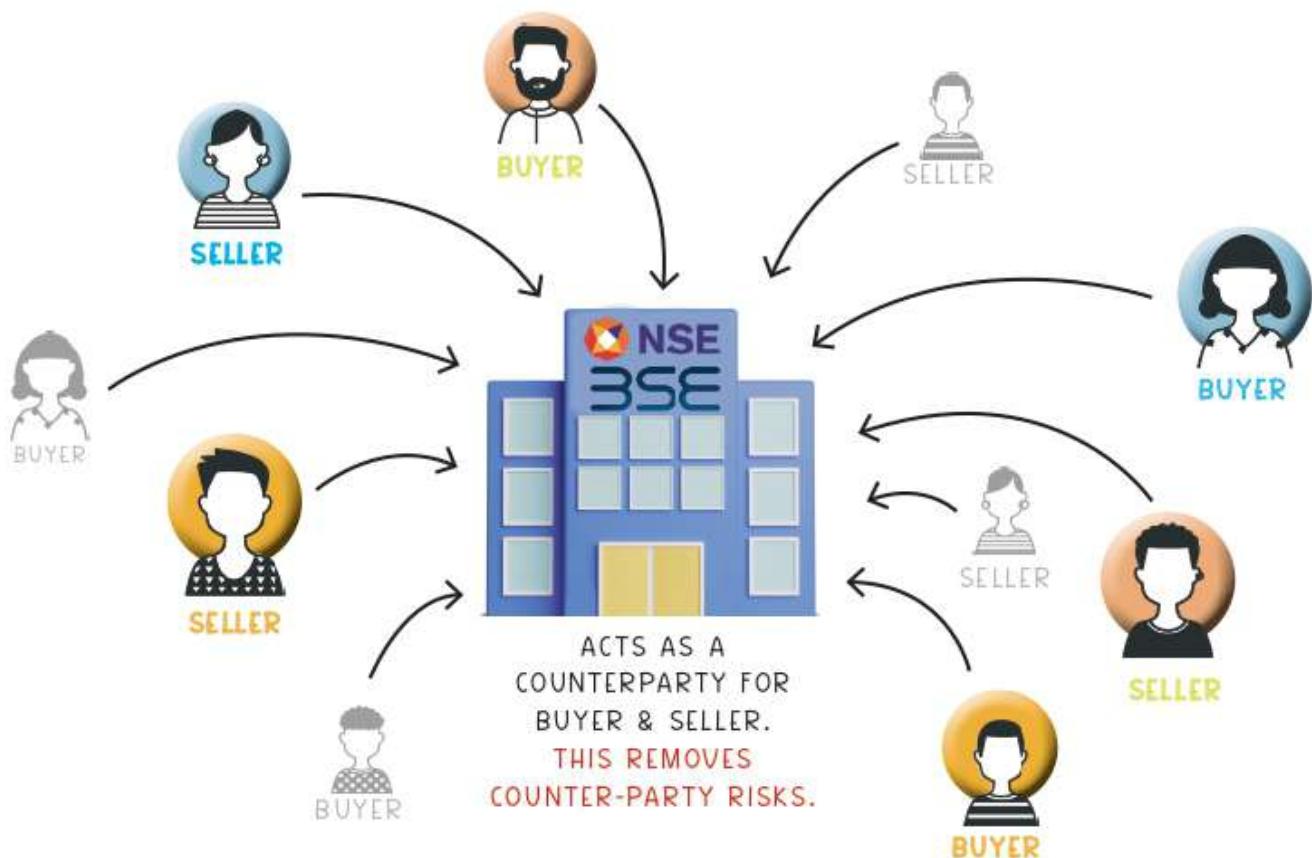


TYPICALLY, FUTURES CONTRACT IN INDIA EXPIRES ON THE LAST THURSDAY OF EVERY MONTH.

ENTERING OR EXITING THE CONTRACT IS QUICK AND EASY AS YOU DO NOT HAVE TO FIND THE COUNTER-PARTY YOURSELVES.



The seller and buyer do not have a contract with each other but with the exchange. They do not even know of each other's existence. The exchange, in a futures contract, acts as a counterparty to every buyer and seller.



So, even if you want to exit the contract at any point, you can do so with the exchange.

For instance, if you entered the contract as a buyer, to square it off you may simply sell the contract and exit from this obligation. You can do this by simply selling them using your trading account with the broker. You do not have to go and find another counter-party.

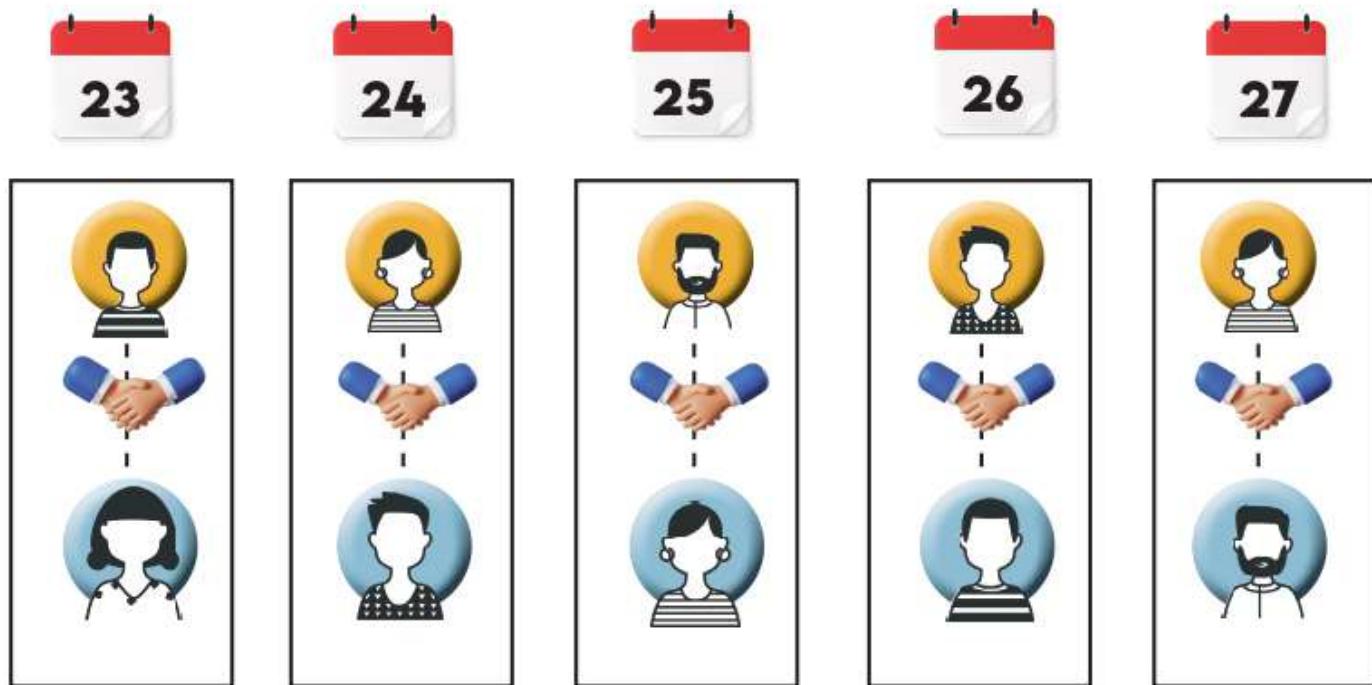


Future contracts are completely financial in nature. They do not involve any physical assets. They are settled by paying the difference itself. There is no involvement of actual delivery of assets.

## 3.2 WHAT HAPPENS ON THE DATE OF SETTLEMENT?

One of the best features of a futures contract is that it is **Marked to Market** daily. Futures contracts account for daily price movements in the market..

“ MARKED TO MARKET ON A DAILY BASIS MEANS THAT PROFITS AND LOSSES ARE SETTLED EVERY DAY. EVERY DAY PROFITS AND LOSSES ARE CALCULATED AND CAPITAL IS TRANSFERRED FROM MARGIN OF LOSS MAKING PARTY TO PROFIT MAKING PARTY.



The positions of both buyer and seller - are settled daily, allowing you to exit or liquidate at any point. This daily mark to market and exchange acting as counter-party ensures that there is no Counter-party risk in Future agreement. There is **NO RISK OF DEFAULT** involved. Also, the parties are required to maintain margin amount which protects the other party from the risk of default. The daily mark to market accounts for margin calls so if there is a default to occur the contract is simply squared off.

In a futures contract, **NO PHYSICAL TRANSFER** of assets is involved in the settlement. But you would need daily cash flows to meet the mark-to-market needs in case you are incurring losses.

NO DEFAULT RISK

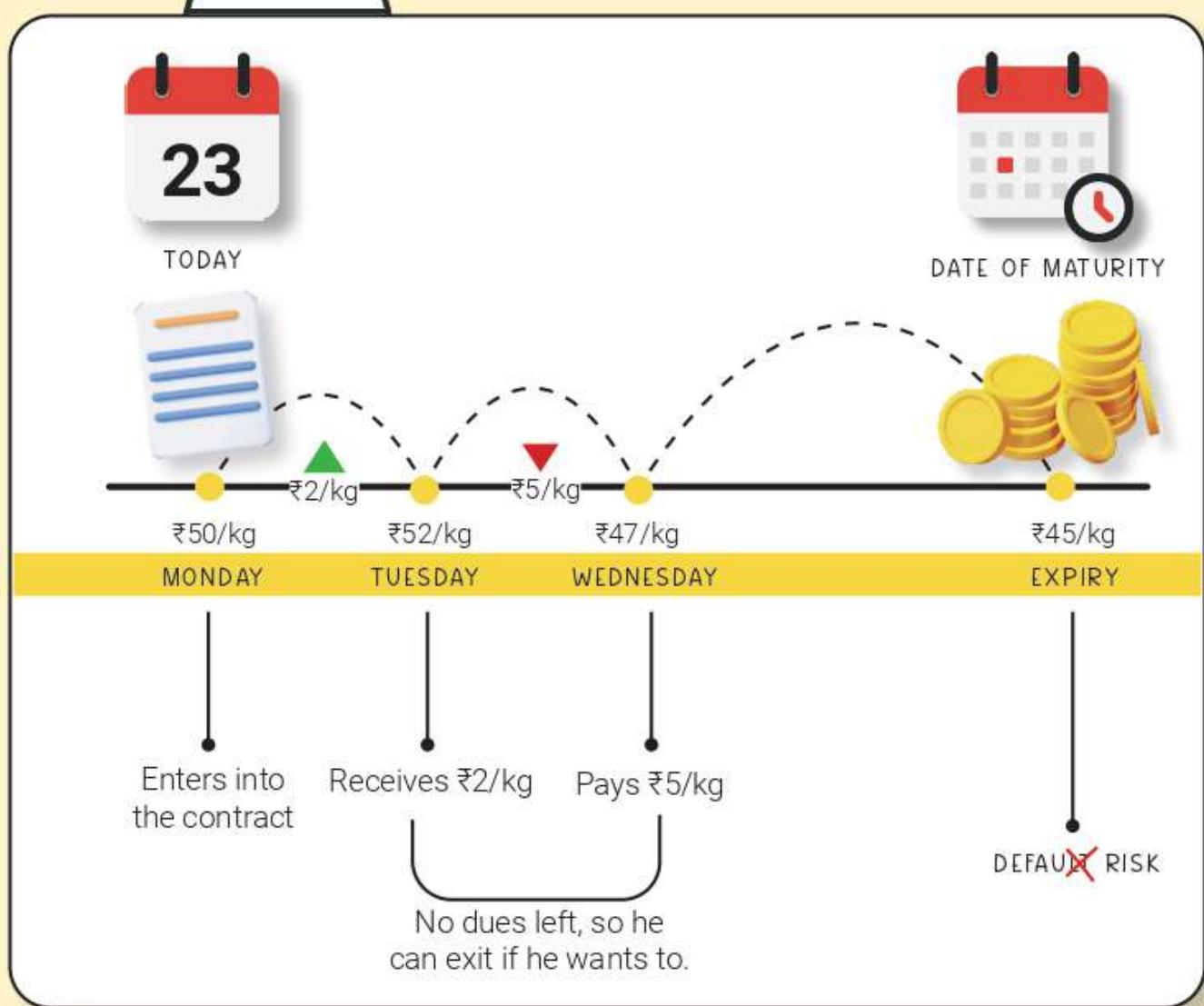
EXIT ANYTIME

CASH SETTLEMENT

PHYSICAL TRANSFER

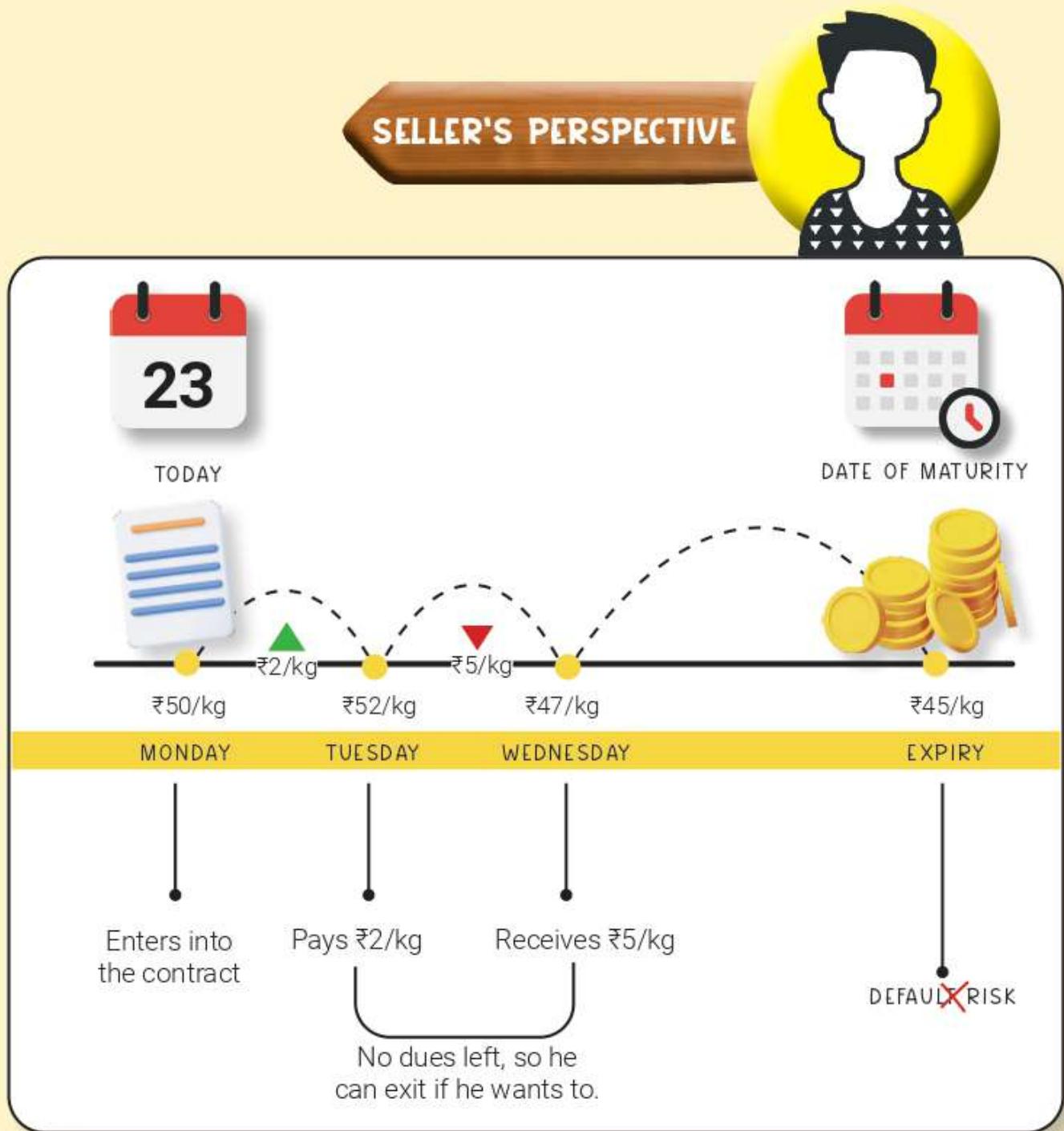


## BUYER'S PERSPECTIVE



Say **the price of the underlying asset (say Wheat) rises by ₹2** - the buyer will get this ₹2/kg from the seller.

Now, **the next day the price falls by ₹5** - the buyer will pay this ₹5/kg to the seller. A margin amount is maintained with the broker where profits are added and losses are deducted from. In case margin falls below a certain amount, the broker will require you to re-finance it else they will square off your position.



On the first day when **the price of the underlying asset (say Wheat) rises by ₹2**, the seller will pay this ₹2/kg to the buyer.

The **next day when the price falls by ₹5**, the seller will get this ₹5/kg from the buyer. Therefore, a futures contract can be bought or sold at any moment before expiry. The profits and losses are settled on daily basis as its marked to market daily.



## 3.3 IMPORTANT TERMS TO UNDERSTAND FUTURES

**SQUARING  
OFF**

**SETTLEMENT**

**EXPIRY  
DATE**

**IMPLIED  
VOLATILITY**

**LOT  
SIZE**

**SHORT  
POSITION**

**LONG  
POSITION**

Before we move on to understand how futures are used in practice, let us go through some important terms to understand Futures contract better.

**BID ASK  
SPREAD**

**PREMIUM OR  
DISCOUNT**

**INITIAL  
MARGIN**

**MAINTENANCE  
MARGIN**

**SPOT  
PRICE**

**FUTURE  
PRICE**

**ARBITRAGE  
OPPORTUNITY**

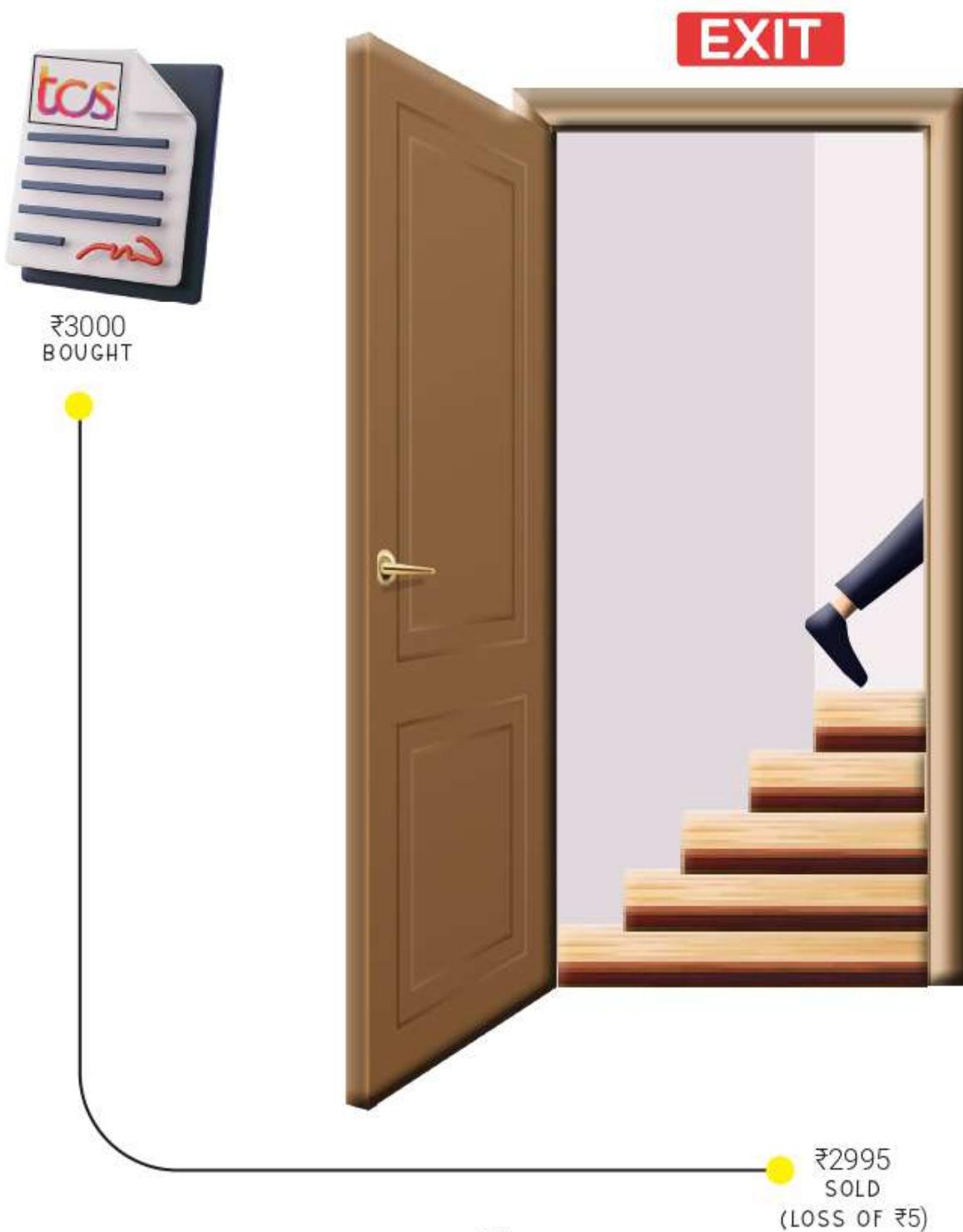
**MARGINS**

**CONTRACT  
CYCLE**

## SQUARING OFF

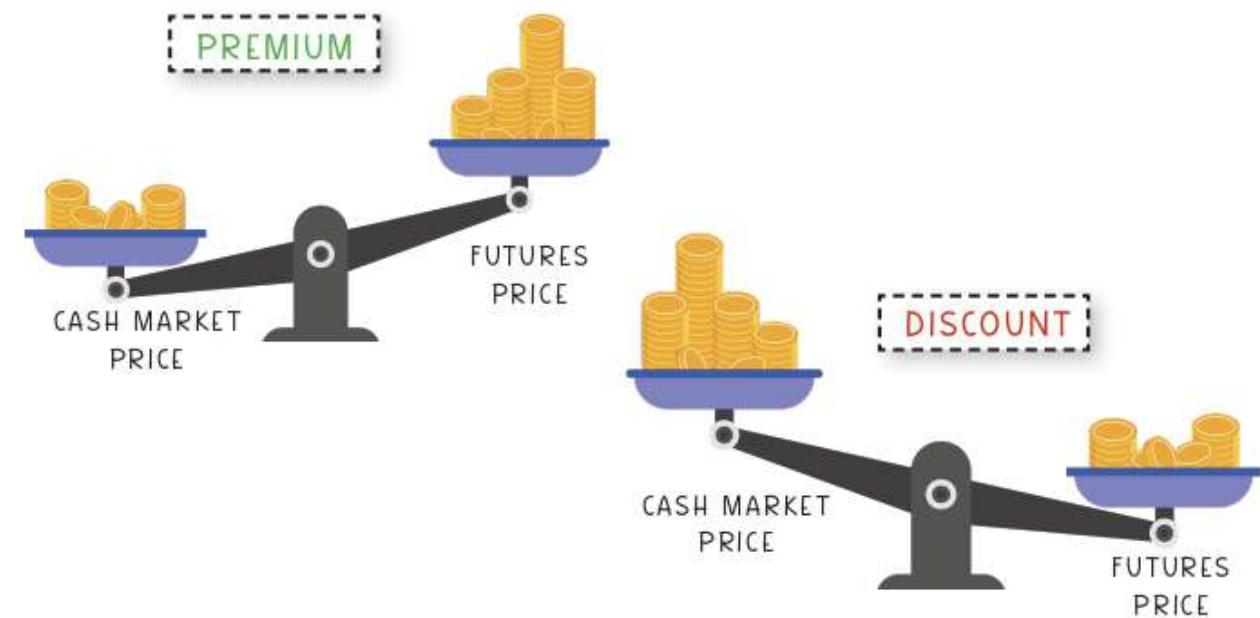
Squaring Off a position basically means exiting a position that you have i.e. selling the contract that you own. Here, we take the opposite trade to the current position. If you sell futures contract that you have bought, or buy shares that you had previously short sold, it is called Squaring off.

**For example**, if you have bought TCS Futures, you will have to sell it to square off the position i.e. remove your exposure. If you had previously short sold, then you will have to buy to square off the position.

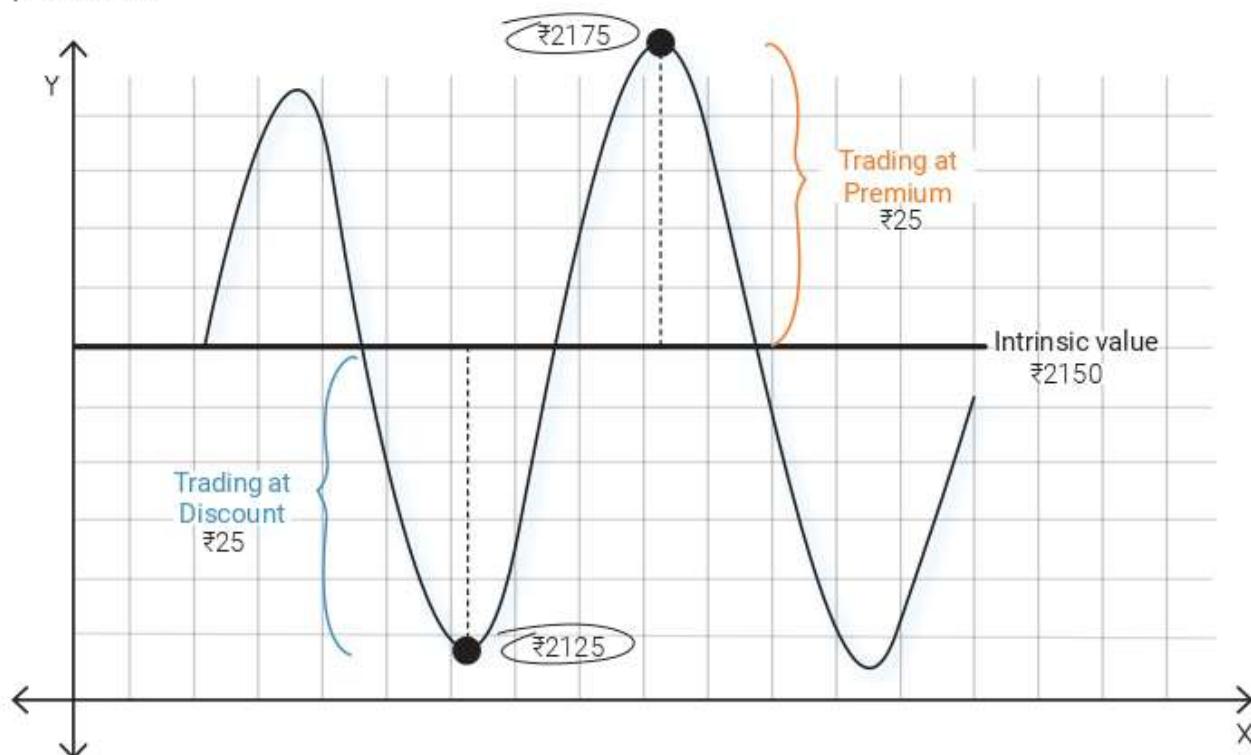


## PREMIUM OR DISCOUNT

Future contracts quote at a similar price as the underlying asset but not exactly same. If the future contract is quoting higher than the cash market, it is called Premium. If it quoting at a price lower than the cash market, it is called Discount.

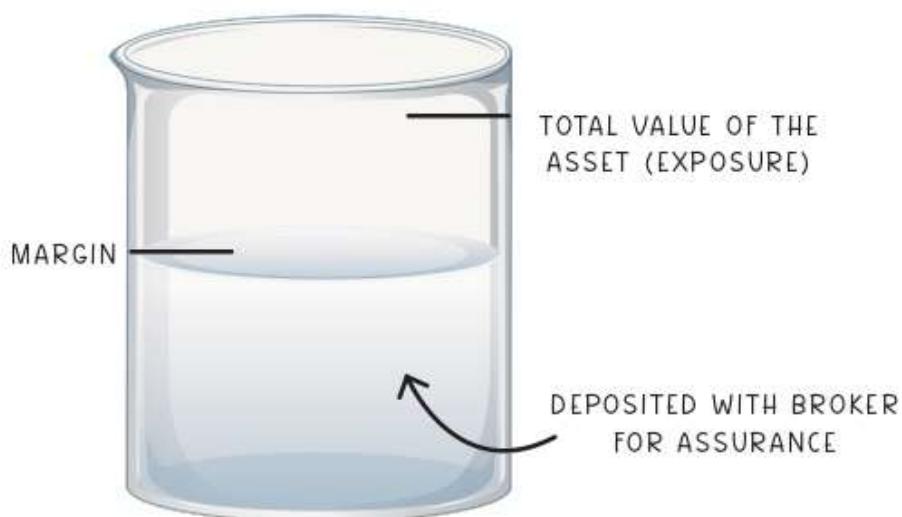


**Let's say** that each share of TCS is trading for ₹2150. Now, if the future contract is quoting for ₹2175, then we can say that it is trading at a premium. If the contract is trading at ₹2125, then we can say that it is trading at a discount. It is suggested to check for at least 5 companies, if the future contract is trading at a discount or premium.



## MARGIN

A security amount that is deposited with the broker that they can use to meet the liabilities in case there is a loss, is called Margin. This is mandatory in futures contracts. If Margin falls below a certain amount than you are required to refill the same otherwise the broker will square-off your position.



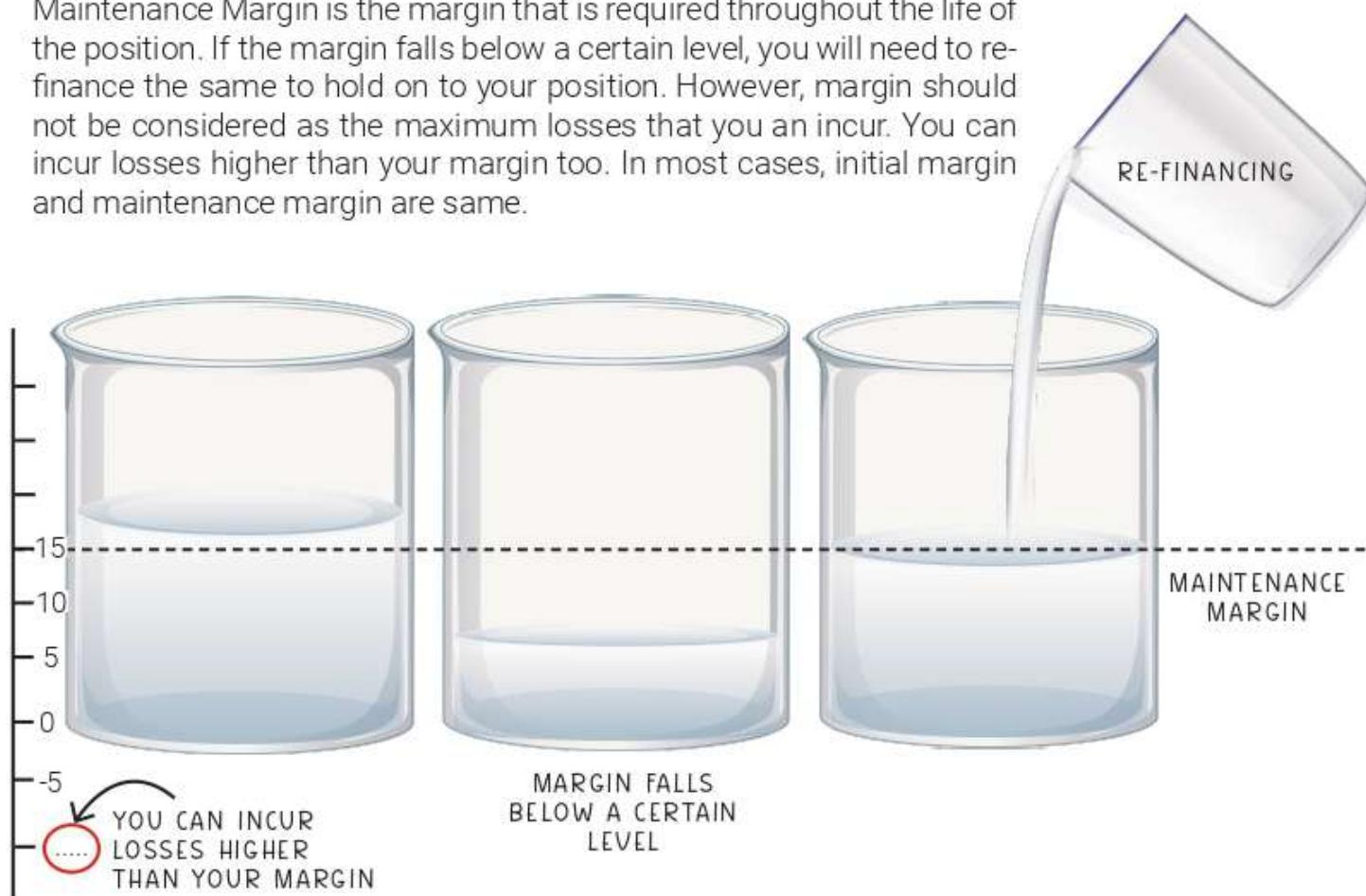
## INITIAL MARGIN

The initial margin is the safety deposit made at the time of entering the futures contract. You must have this amount in your trading account to execute transactions. Brokers also give margin taking your assets as collateral. That means, lets say you have assets worth ₹5,00,000 in your Demat account. So, against that, the broker may allow ₹3,00,000 that can be used as margin. However, you will still need some cash to meet daily mark to market settlements. Lets take an example where 20% of the lot value needs to be maintained as Margin amount.



## MAINTENANCE MARGIN

Maintenance Margin is the margin that is required throughout the life of the position. If the margin falls below a certain level, you will need to re-finance the same to hold on to your position. However, margin should not be considered as the maximum losses that you can incur. You can incur losses higher than your margin too. In most cases, initial margin and maintenance margin are same.



## EXPIRY DATE

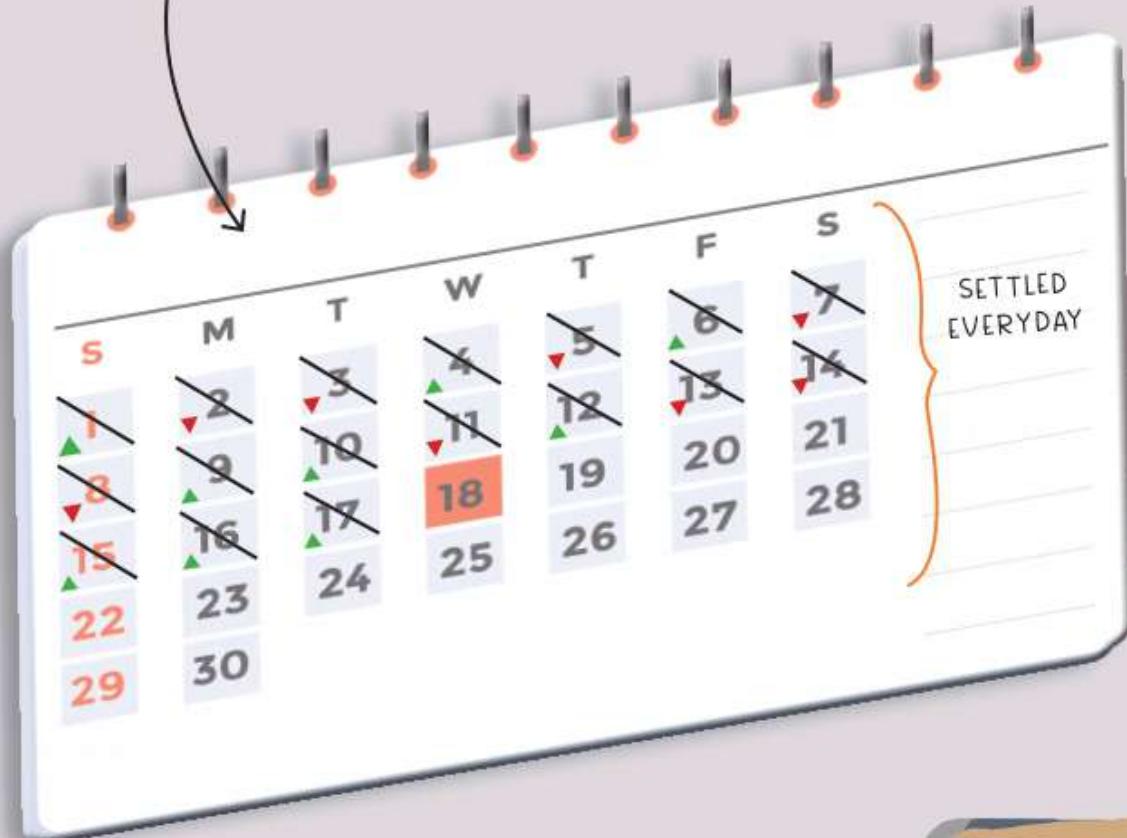
Expiry of the contract is the last date or the date till which the contract is valid. All profits and losses till this date needs to be settled. Every derivatives contract has an Expiry date. In India, for stock related futures, they expire on last Thursday of every month.



**DATE OF EXPIRY**  
LAST THURSDAY OF THE MONTH.

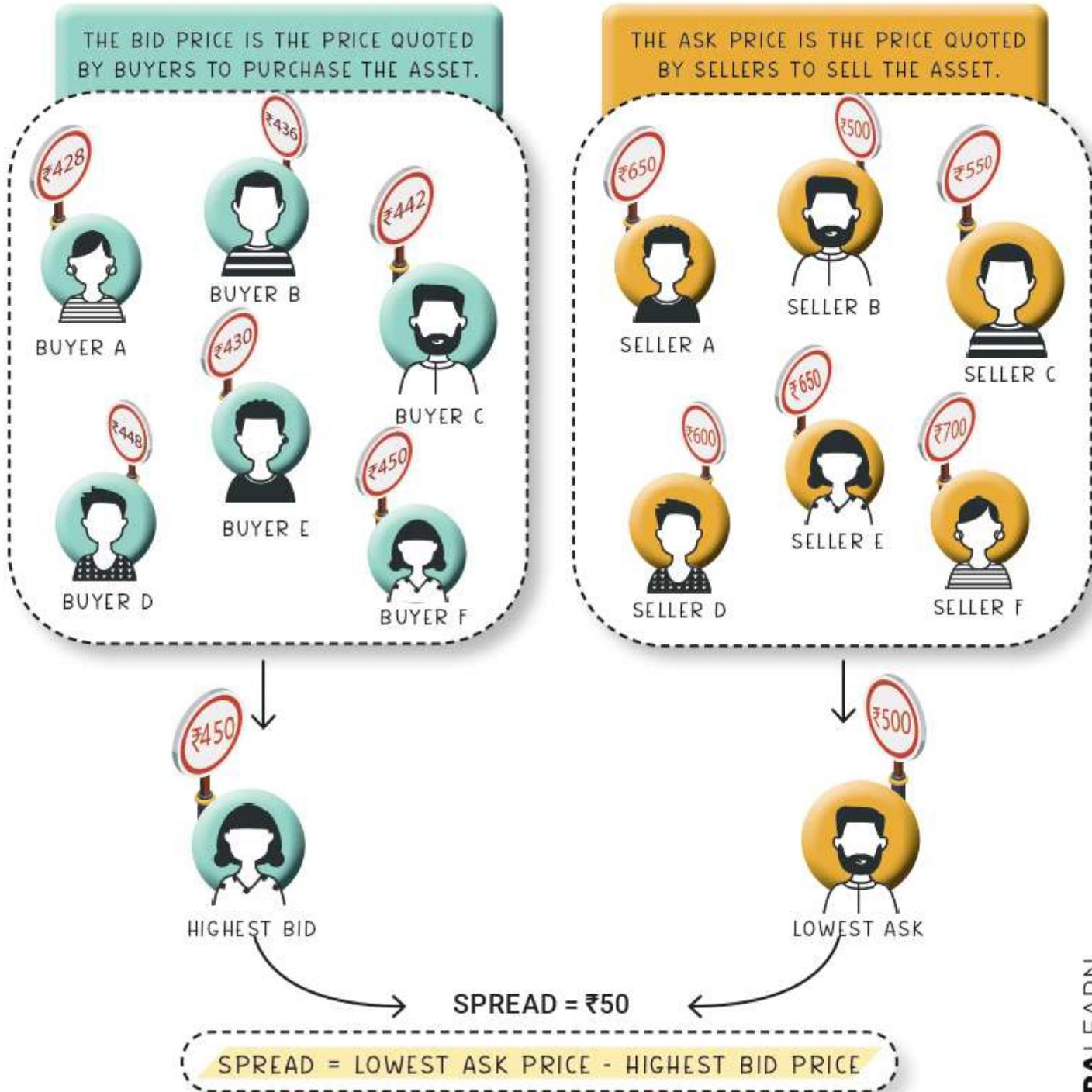
## SETTLEMENT

Settlements refer to the actual payment of the profits and losses. For Futures, as we discussed earlier, the settlements are done on a daily basis.



## BID ASK SPREAD

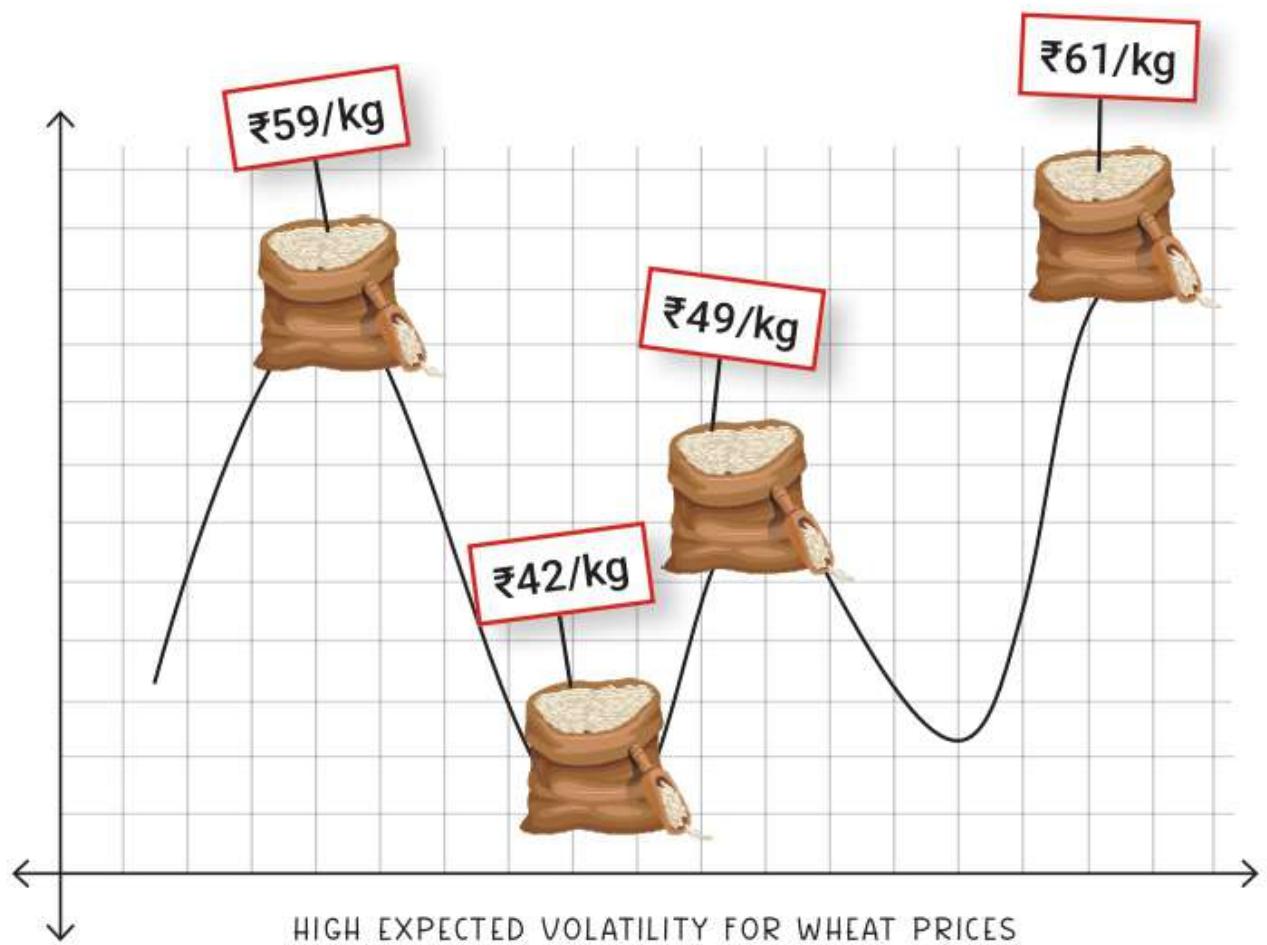
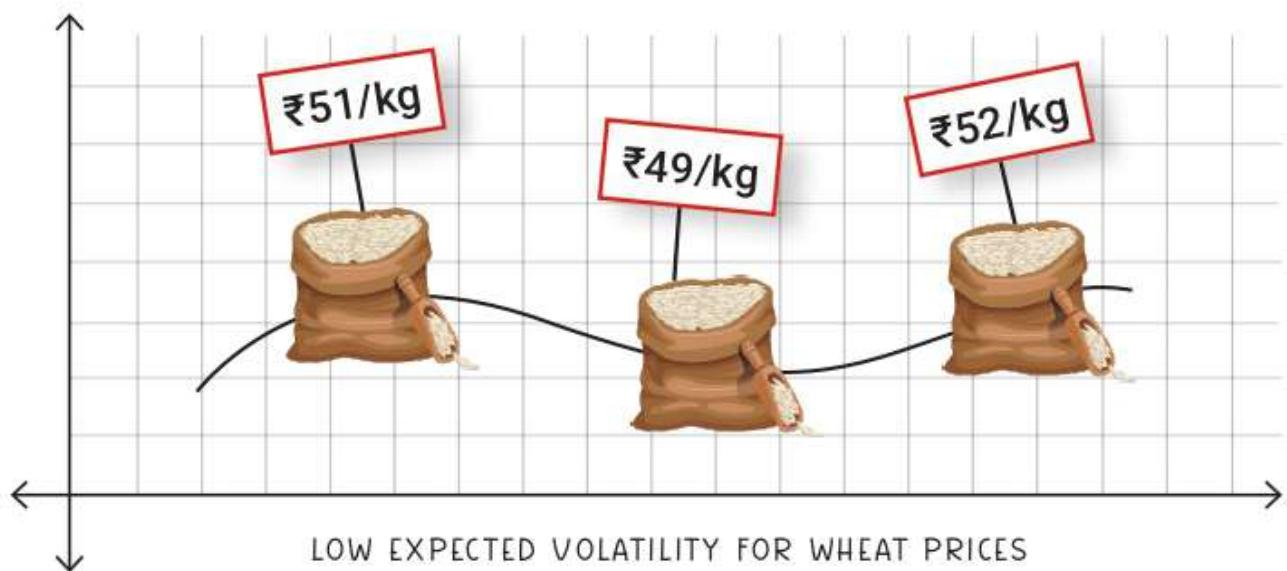
Entire stock market operates with an auction model in place. Buyers bid about the highest price they are ready to pay for an asset or a derivative and sellers quote the lowest price that they are comfortable selling. The former is known as Bid Price and latter is the Ask Price. Whenever they meet, trade gets executed. The difference between the two is called Bid-ask spread. So, whenever you buy anything, you will pay the Ask Price and to sell something you will get the Bid Price.



The spread is the difference between the bid and ask prices of an asset. If there are a large number of buyers and sellers in the market, then the bid-ask spread will be low. If the market has fewer buyers and sellers, then bid-ask spread would be high. Bid-ask spread adds to the transaction costs that we incur when buying and selling derivative contracts.

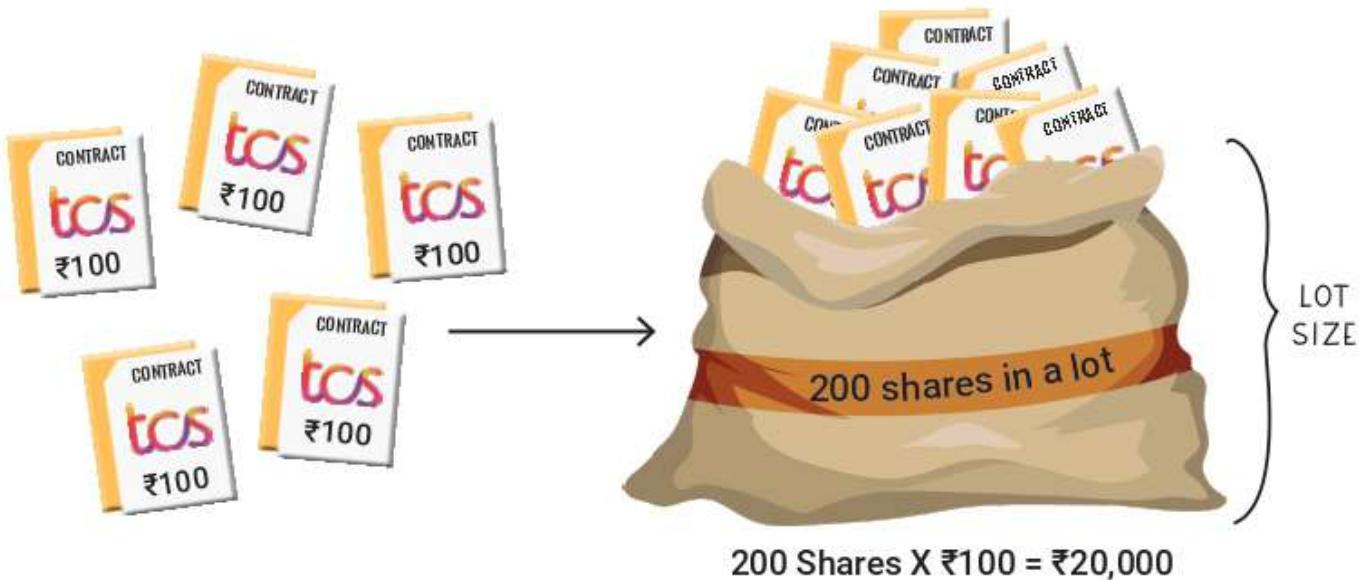
## IMPLIED VOLATILITY

Implied volatility is the market's expectation of how volatile an asset is going to be. If an asset is highly volatile- it will have higher swings in its prices. It is one of the most important inputs in calculating option prices.



## LOT SIZE

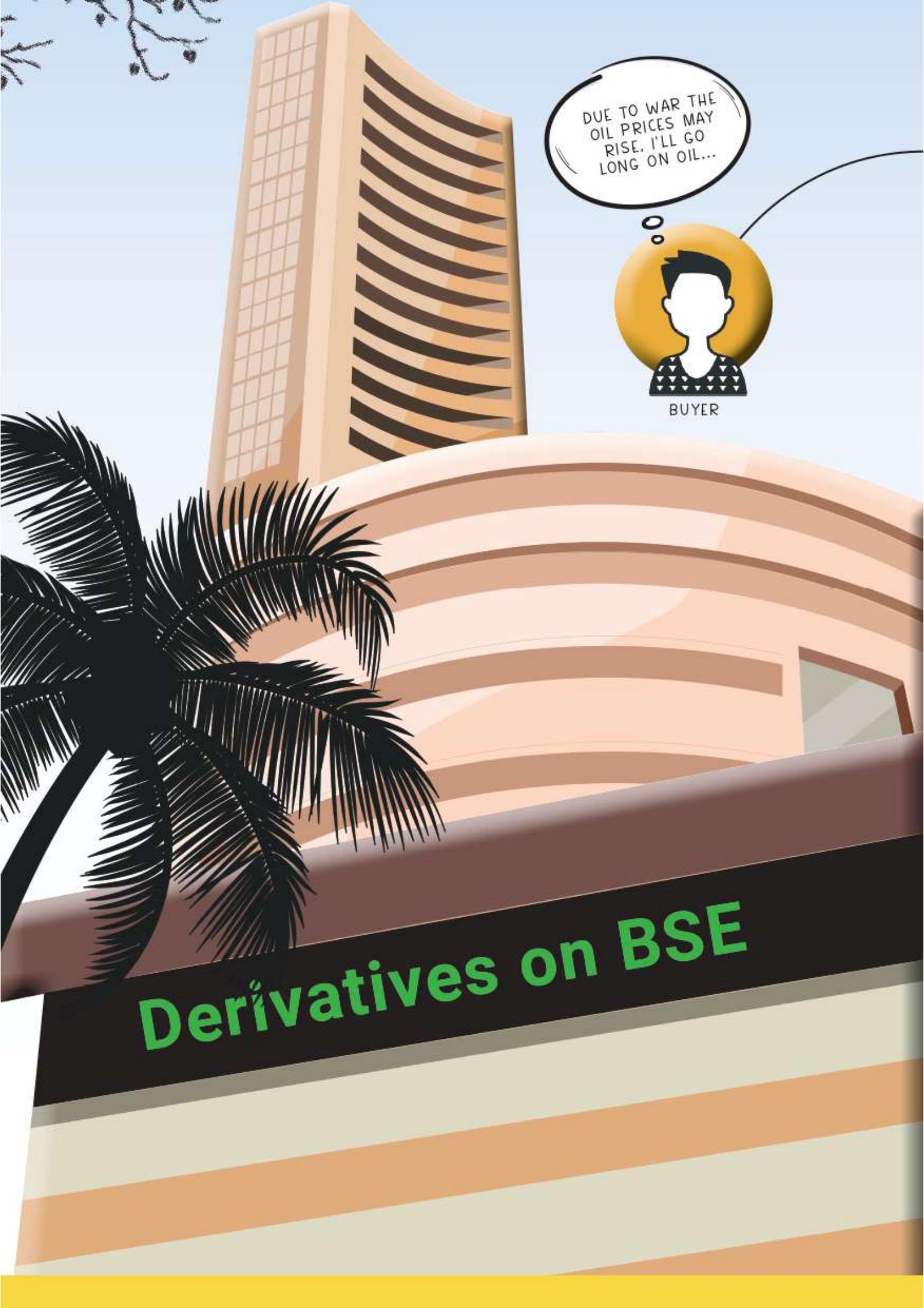
When buying Futures or Options, you cannot buy a single share or a few of them. You need to buy them in lots. Each lot will represent a certain number of shares. The number of shares that each lot represents is called Lot size. Transaction can only be executed in lots i.e. multiple of lot sizes. You can not have futures on 1 share of TCS. You will have to buy one lot at least where each lot is say, 200 shares.



## ARBITRAGE OPPORTUNITY

An arbitrage opportunity is essentially the discrepancies in price that arise in the market for an asset. Lets say that there is a huge difference between price of an asset and its futures contract. Now, we know that on maturity, both these prices merge. So, we might buy shares and sell futures to benefit from the difference. Such opportunities where trader intends to benefit from such market inefficiencies are called Arbitrage opportunities. They can arise in different forms and different traders use different strategies to benefit from these.





A stylized illustration of a modern skyscraper with a grid of windows on the left and a curved facade with horizontal stripes on the right. In the foreground, dark silhouettes of palm trees are visible against a light blue sky. A large, stylized graphic of a wavy oil tank or storage facility dominates the lower half of the image, colored in shades of brown, tan, and cream.

DUE TO WAR THE  
OIL PRICES MAY  
RISE. I'LL GO  
LONG ON OIL...



**Derivatives on BSE**

## LONG POSITION

The buyer of the contract is said to be long on a futures contract. They are the ones expecting the price will rise in future. They enter the contract, therefore, to buy at low and then sell at a higher price later as per their expectation of a price increase.

## SHORT POSITION

The seller of the contract is said to be short on a futures contract. They are the ones that expect the price of the underlying asset to fall and doing so they will benefit from the contract. They intend to sell higher and then buy later at a cheaper price.

DUE TO EV BOOM  
THE OIL PRICES  
MAY FALL, I'LL GO  
SHORT ON OIL...



SELLER

MCX ₹3000

## SPOT PRICE

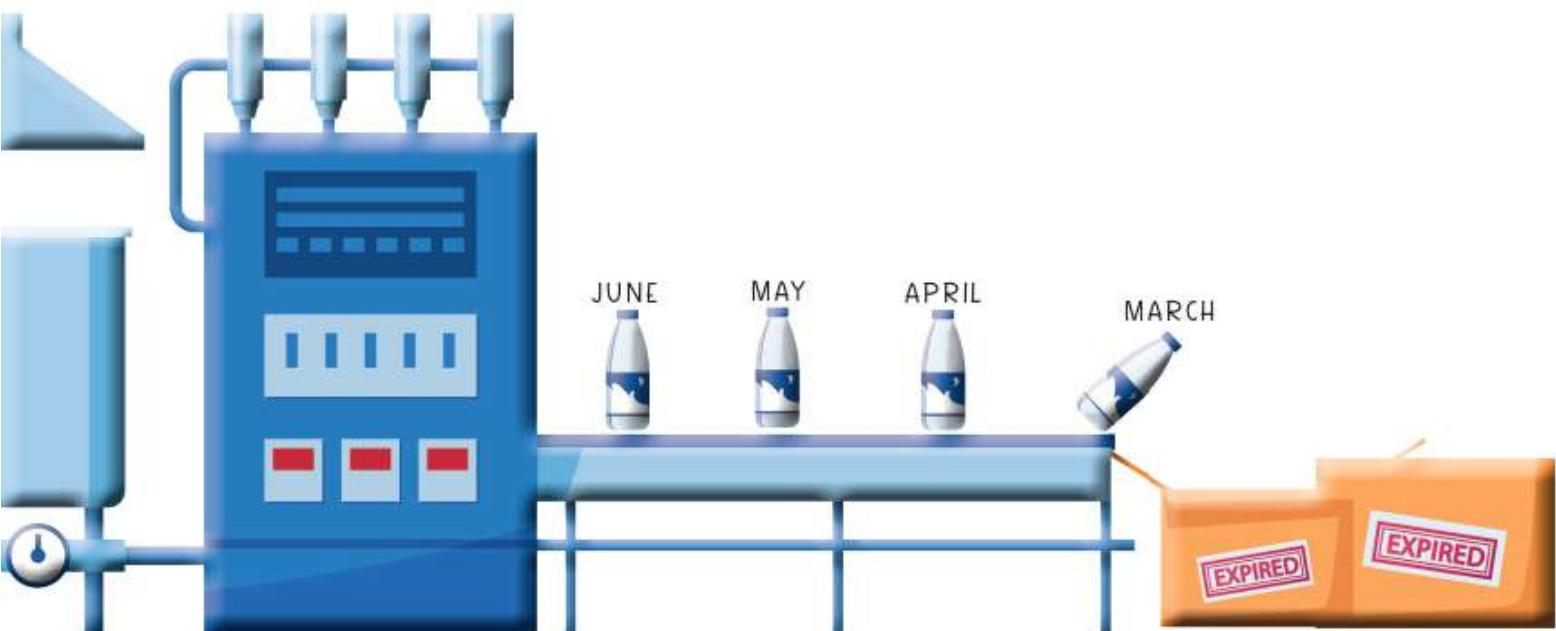
The spot price is the current market price at which an asset is trading. For instance, TCS = ₹3000.

## FUTURES PRICE

Futures price is the price at which the futures contract of the underlying asset is trading. We will have different prices for same futures contract with different expiries. For instance, TCS 21 NOV FUT = ₹2900.



## CONTRACT CYCLE



Contract Cycle refers to the time when a particular contract is released in the market or is open to trade and the time when it expires. It also includes, how many different expiries trade at a given point in time in the market for the same underlying asset. For instance, for Indian stocks, three expiries are active at any point in time. At any point, you can trade with futures contract that have - expiry in current month, expiry in month after this and expiry two months from now. This shows when a contract is active and when it expires.

## 3.4 DIFFERENCE BETWEEN LONG AND SHORT POSITION



EXPECTS THAT THE PRICE OF UNDERLYING ASSET WILL RISE.

BUYING A FINANCIAL INSTRUMENT

PROFIT BOOKING BY SELLING THE ASSET AT HIGHER PRICE.

EXPECTS THAT THE PRICE OF UNDERLYING ASSET WILL DECLINE.

SELLING A FINANCIAL INSTRUMENT

PROFIT BOOKING BY BUYING BACK THE ASSET AT LOWER PRICE.

## 3.5 FEATURES OF FUTURES CONTRACT



EXCHANGE TRADED CONTRACT.



STANDARDISED AND REGULATED CONTRACT.



DAILY SETTLEMENT.



GENERALLY USED FOR RISK HEDGING.

BUY

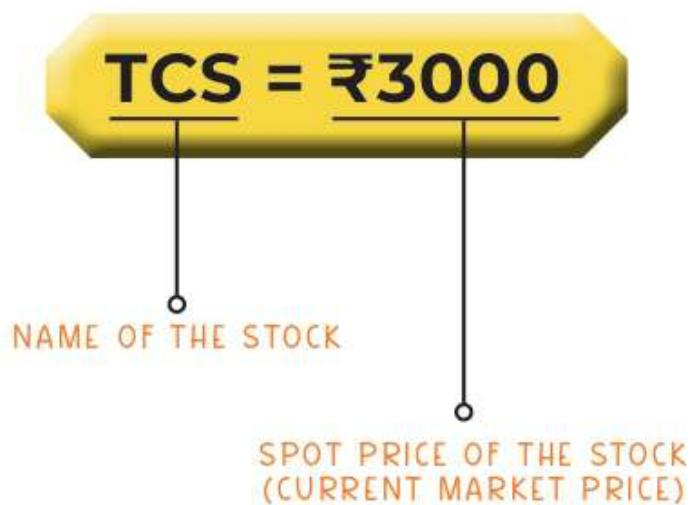
SELL

FUTURES CONTRACT IS AN OBLIGATION TO BUY/SELL AN UNDERLYING INSTRUMENT ON A FUTURE DATE AT AN AGREED PRICE.

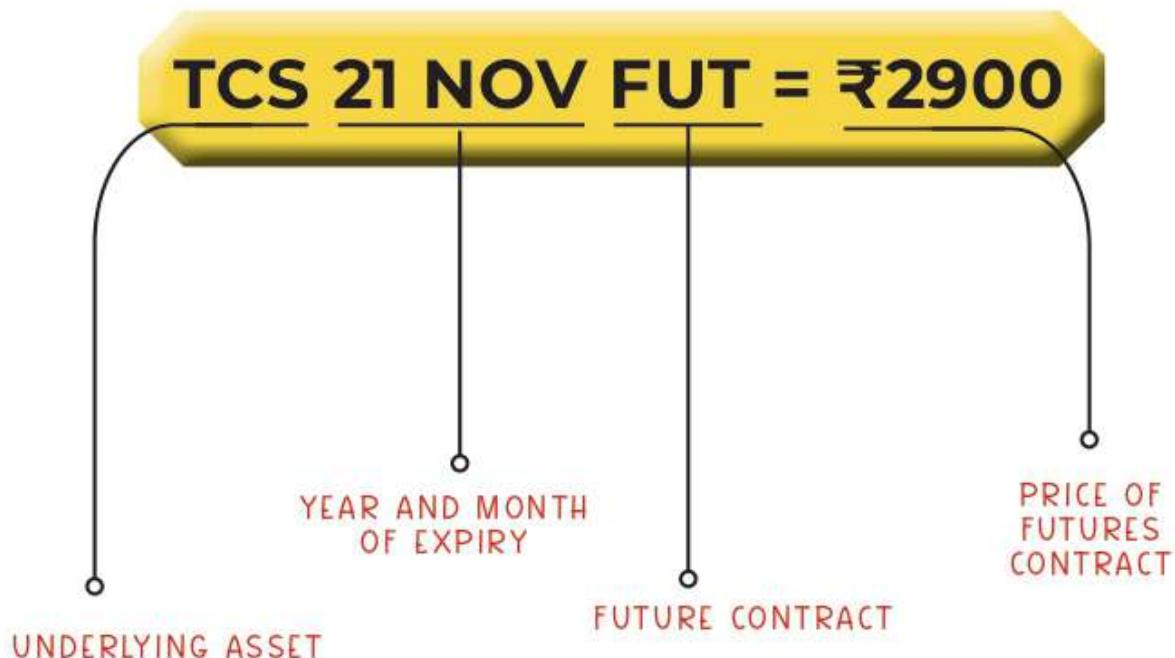
A futures contract is generally used for risk hedging purposes. For instance, if you have an exceptionally large chunk of Reliance shares and you are expecting some movement against your position then instead of selling the whole lot you may simply hedge yourself via a futures contract and bag your profits from it to compensate your actual position with the shares you own of Reliance.

## 3.6 WHAT DOES A FUTURES CONTRACT QUOTATION LOOK LIKE?

The traded price of a TCS at the spot is directly written as TCS = ₹3000 or whatever the current price may be.



For a futures contract, on the other hand, the futures price is quoted with its Month and year of expiry. For instance, a TCS November'21 futures contract would look like



## 3.7 WORKING OF FUTURES CONTRACT



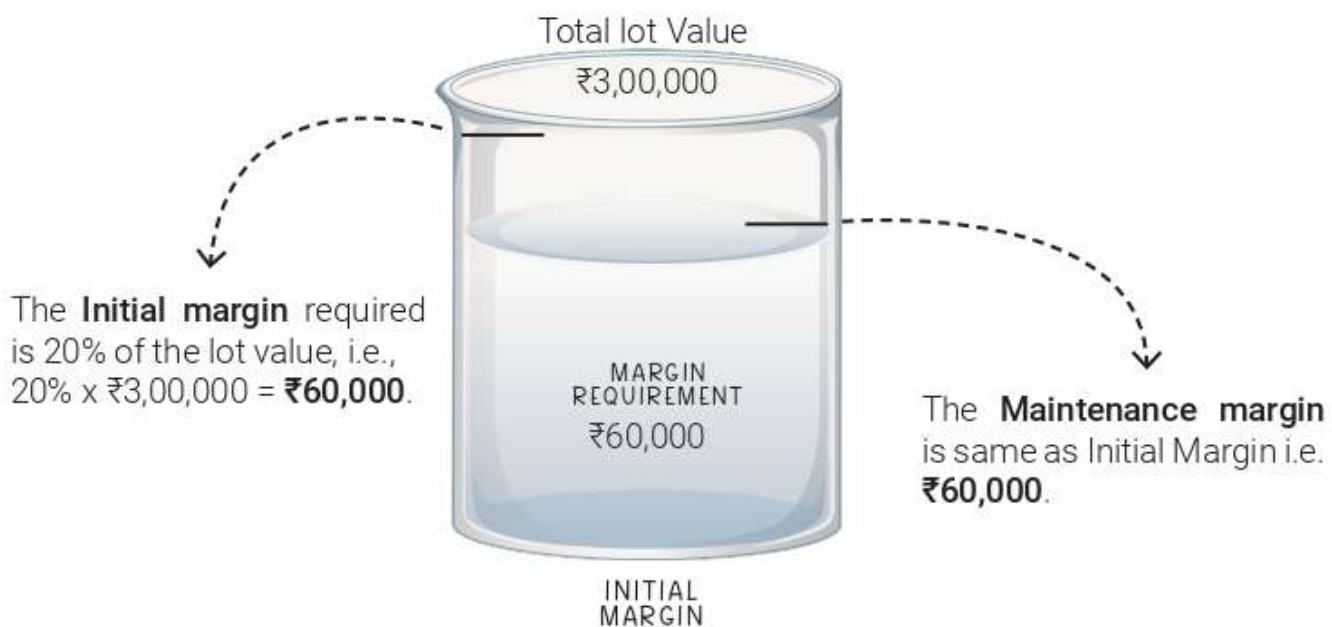
Explainer Video

Let us understand the practical working of futures in-depth with a practical example or scenario of a futures contract.

DATE	WIPRO	TCS	INFOSYS	TECH MAHINDRA
29 <sup>th</sup> Jan,2022	408	2914	1621	1076
23 <sup>rd</sup> Feb,2022	428	2990	1638	1088
30 <sup>th</sup> March,2022	432	3000	1635	1080
28 <sup>th</sup> April,2022	420	2920	1612	1085
25 <sup>th</sup> May,2022	412	2900	1606	1078



<b>DATE OF ENTERING INTO THE CONTRACT</b>	25 <sup>th</sup> October
<b>DATE OF EXPIRY</b>	25 <sup>th</sup> November
<b>CURRENT MARKET PRICE OF TCS</b>	₹2900
<b>THE LOT SIZE STATED BY THE EXCHANGE FOR THE CONTRACT</b>	100 shares
<b>THE FUTURES PRICE OF TCS</b>	TCS 22 NOV FUT = ₹3000.
<b>TOTAL LOT VALUE</b>	Futures price x Lot size, i.e., ₹3000x100 = ₹3,00,000.



(Note: In India, generally, the initial margin and maintenance margin is the same.)

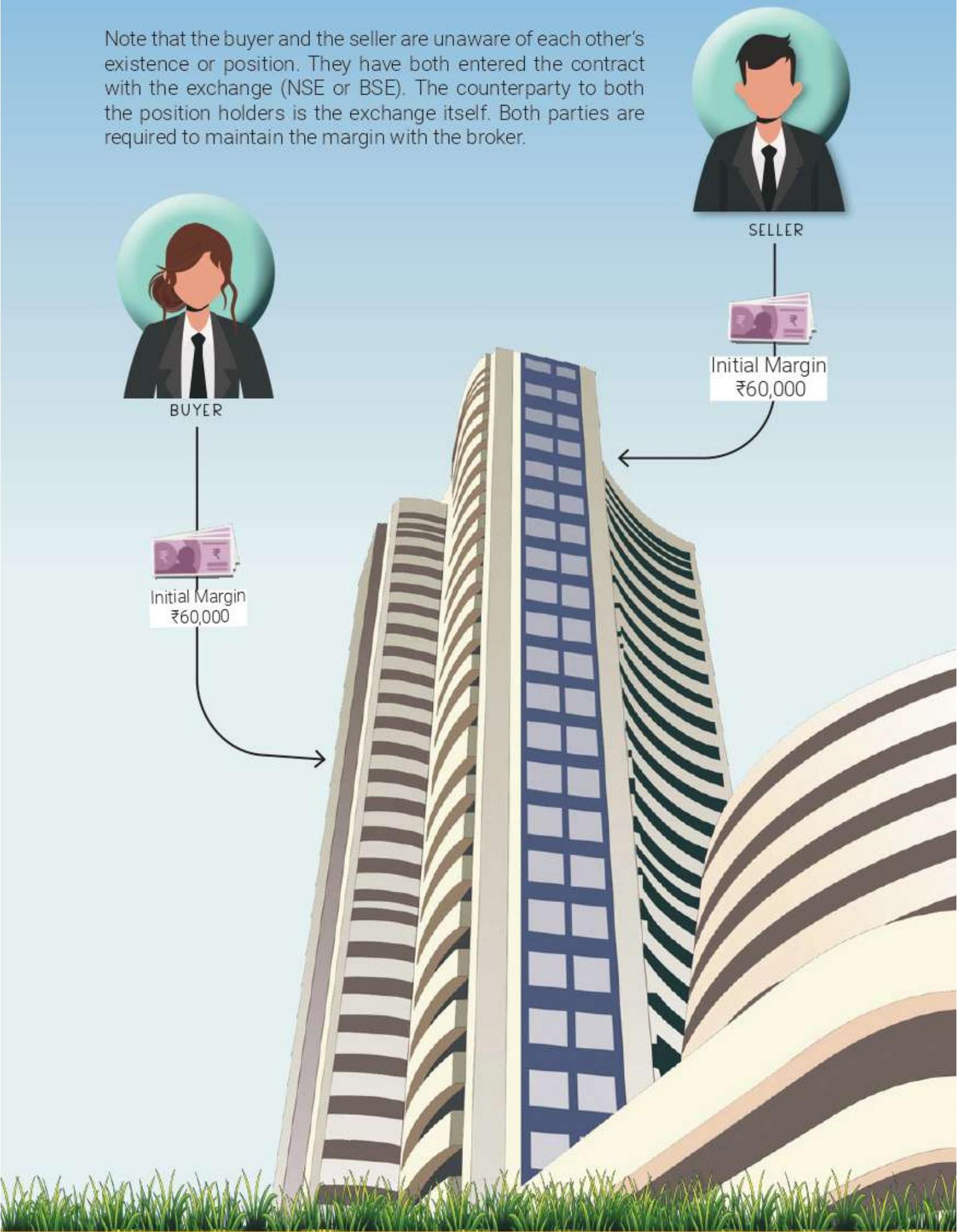


The buyer of the contract is taking the Long Position in the contract based on his Analysis. We can see that the buyer is assuming that the price will increase i.e. they are bulling on the underlying stock.

The seller of the contract is taking the Short Position in the contract based on his Analysis. The seller is assuming that the price of the underlying asset will decrease i.e. they are bearish on the asset.



Note that the buyer and the seller are unaware of each other's existence or position. They have both entered the contract with the exchange (NSE or BSE). The counterparty to both the position holders is the exchange itself. Both parties are required to maintain the margin with the broker.





That is why with less capital, they could take larger positions. This increases both risks and returns for both the parties. We can say that Futures market uses Leverage to increase risk and return potential for both the parties.

The price of the asset keeps on changing on an everyday basis. Based on the change in price of asset, the price of the future contract will also change.

**DAY 1**

The price goes up by 10% 

Say on Day 1, the price of the underlying asset TCS goes up by 10%.

	SELLER	BUYER
Initial Margin	₹60,000	₹60,000
+ 10% ( $\text{₹}3,00,000 \times 10\%$ )	(₹30,000)	₹30,000
Balance	₹30,000	₹90,000



SELLER

To compensate the Buyer for this profit, the seller will be debited with ₹30,000, his account balance now stands at ₹30,000.



BUYER

Since the price has gone up, the buyer of the contract stands at a profit of ₹30,000 (hypothetical). The account balance of buyer stands at ₹90,000. He may withdraw the surplus from the account.



That is typically how the futures contract is marked to market. The contract will be settled for the price movement each day.

You see how the margin amount increased by 50% and reduced by the same for the buyer and seller respectively. This is because of the high risk and high reward nature of future contracts.



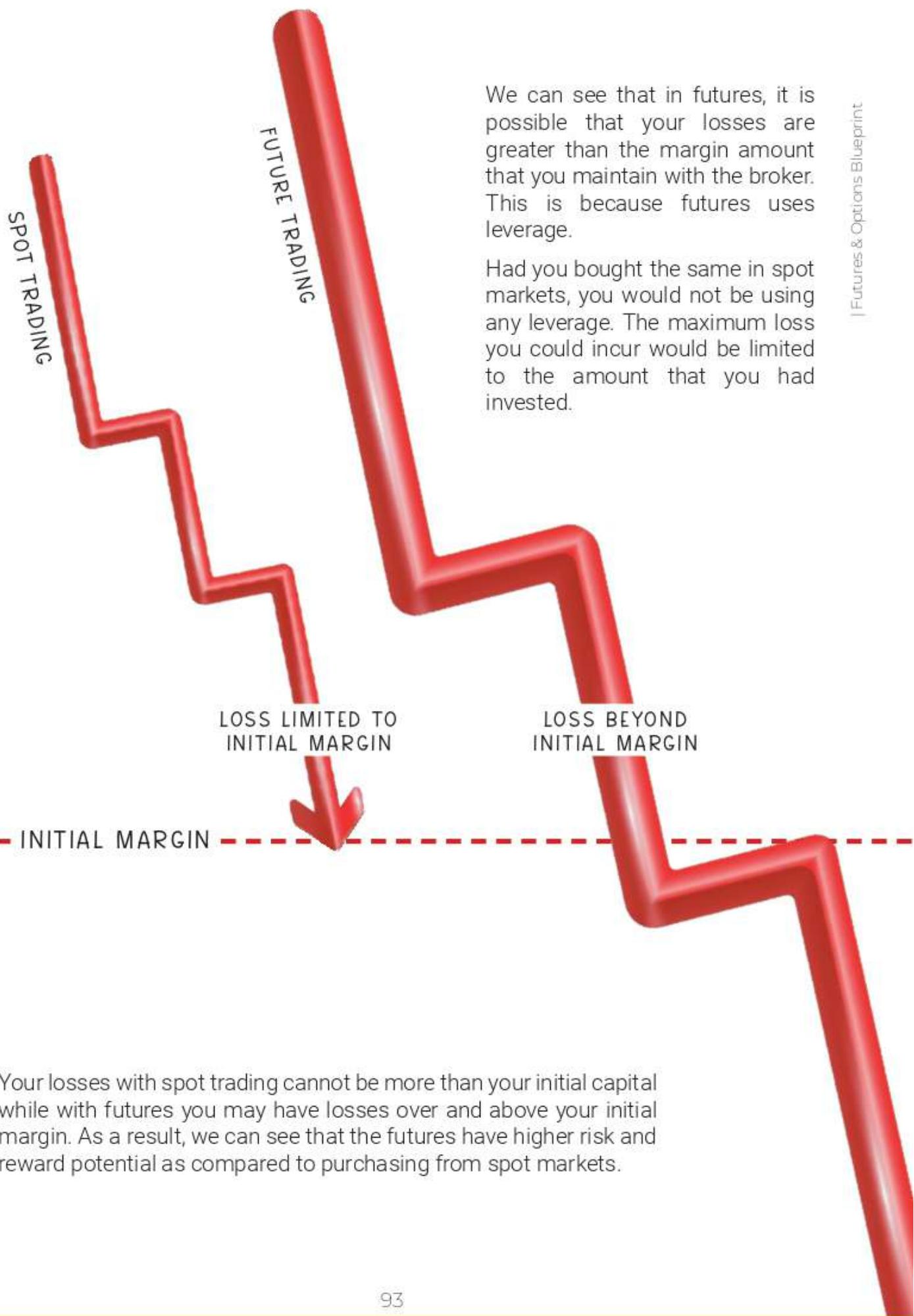
**DAY 2**

The price goes down by 30% 

Say on Day 2 now, the price of the underlying asset TCS has gone down by 30%. Assuming both stands at the initial margin balance of ₹60,000 each.

	SELLER	BUYER
Initial Margin	₹60,000	₹60,000
- 30% (₹3,00,000 x 30%)	₹90,000	(₹90,000)
Balance	₹1,50,000	(₹30,000)



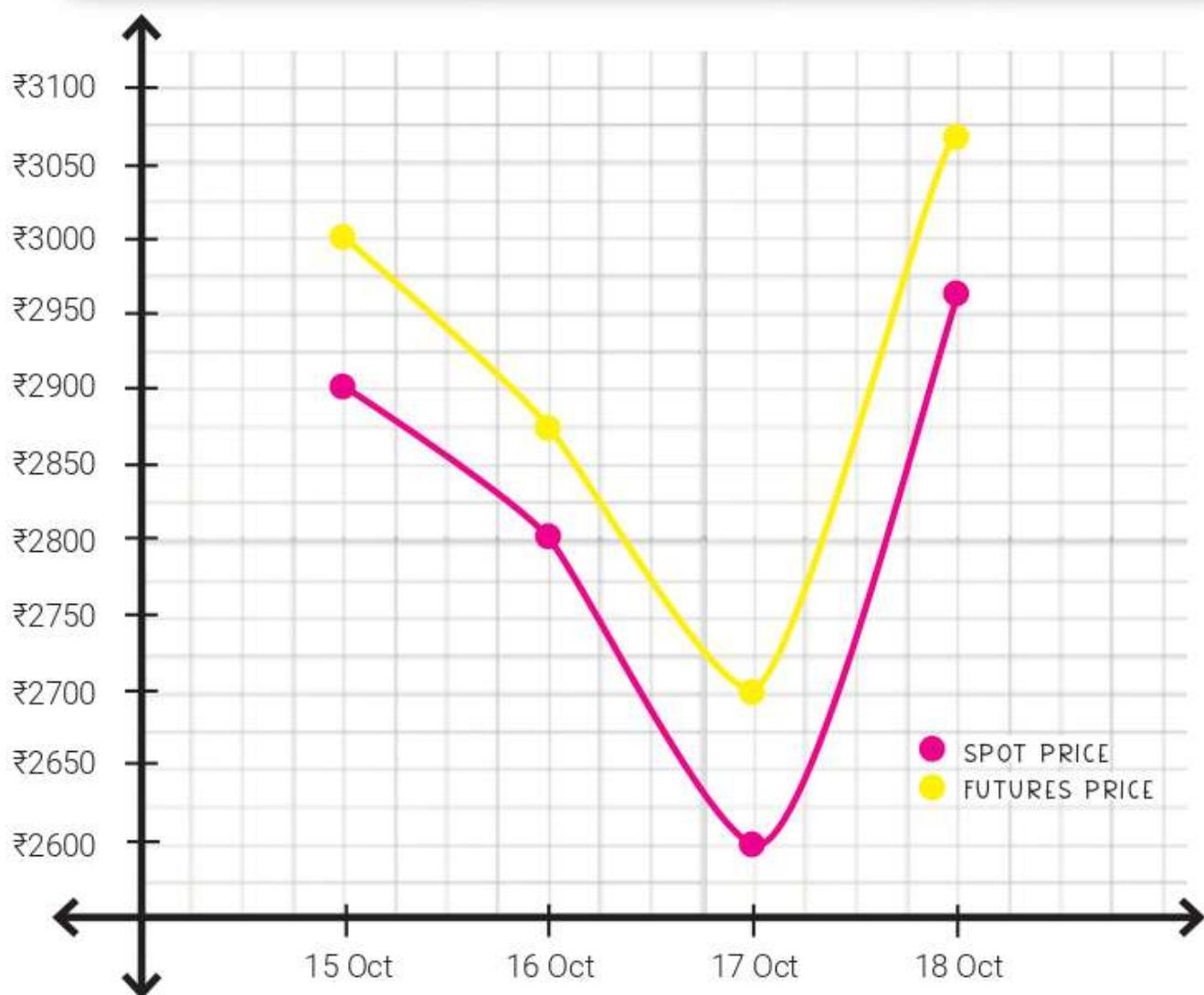


## 3.8 WHAT DOES MARK TO MARKET MEAN?



Explainer Video

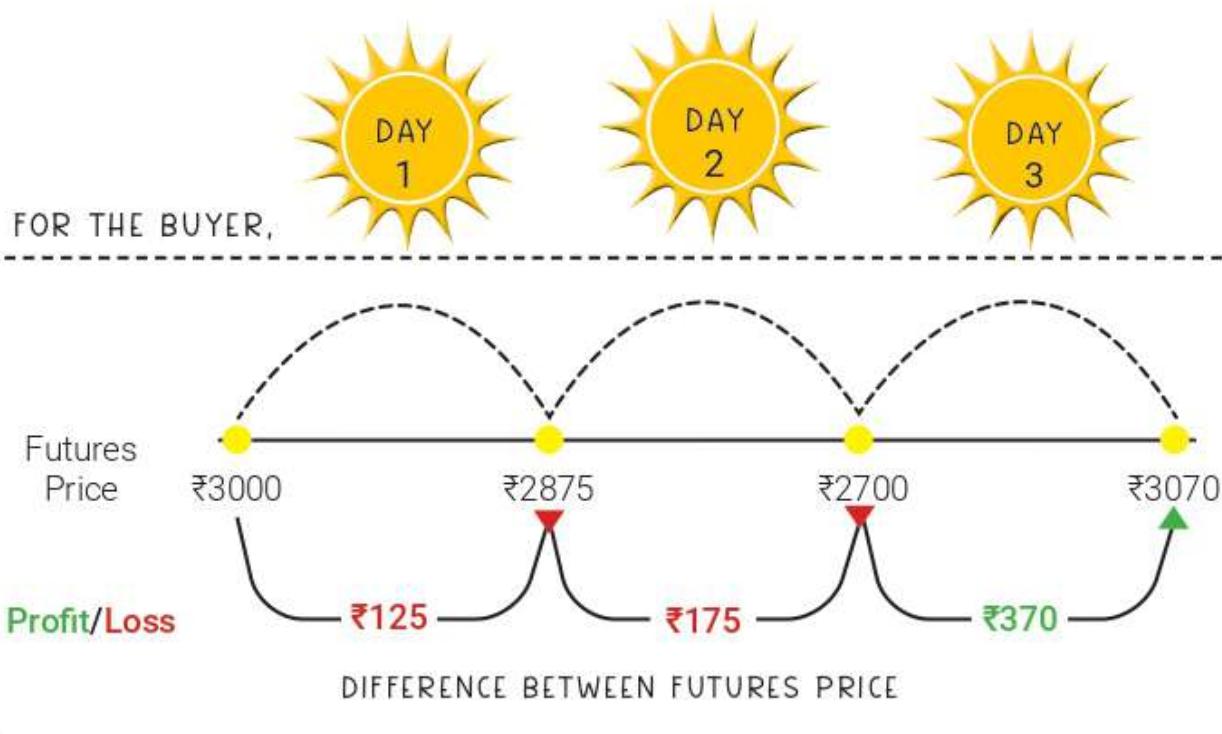
Let us understand the Mark to market settlement with an example.



As we can see, the date-wise Spot price and Futures price are mentioned for TCS with a :

LOT SIZE IS OF 100.

INITIAL MARGIN IS ₹60,000.



For a mark to market settlement, we will look at the futures price difference on a daily basis. Keep in mind that we need to focus on change in price of futures contract and not the spot contract.

Now let us move to the working by having the two positions of a futures contract in mind, i.e., long position and short position.

OCTOBER  
15

OCTOBER  
16

For the buyer of the contract, accounting for 15th October to 16th October price movement, there is a loss of ₹125. The total loss amount payable by the buyer to the seller is ₹12,500. This will be deducted from the margin account of the buyer.

The seller, on the other hand, is credited with ₹12,500 in his account. The balance on the seller's side stands at ₹72,500. The surplus of ₹12,500 is allowed to be withdrawn by him.

DAY 1

	SELLER	BUYER
Initial Margin	₹60,000	₹60,000
- Loss of ₹125 (125 x 100)	₹12,500	(₹12,500)
Total balance	₹72,500	₹47,500

The balance of the Buyer ₹47500 < ₹60000 (margin), due to which he would be required to bring in additional capital of ₹12,500.

- Withdrawals	—	—
+ Additional Margins	—	₹12,500
Total balance	₹72,500	₹60,000

NOTE : For the continuation of the example, let us assume that no withdrawals were made and the balance is the same as stated after profit adjustment.

OCTOBER

**16**

OCTOBER

**17**

For the buyer again, accounting for 16th October to 17th October price movement, there is a loss of ₹175. The total loss amount payable by the buyer to the seller is ₹17,500. This will be deducted from the margin account of the buyer.

The seller, on the other hand, is credited with ₹17,500 in his account. The balance on the seller's side stands at ₹90,000. The surplus of ₹30,000 may be withdrawn by him.

**DAY2**

	SELLER	BUYER
Balance b/f of day 1	₹72,500	₹60,000
- Loss of ₹175 (175 x 100)	₹17,500	(₹17,500)
Total balance	₹90,000	₹42,500

The balance of the Buyer ₹42,500 < ₹60,000 (margin), due to which a margin call would be sent to bring additional funds of ₹17,500.

- Withdrawals	—	—
+ Additional Margins	—	₹17,500
Total balance	₹90,000	₹60,000



*NOTE : For the continuation of the example, let us assume that no withdrawals were made and the balance is the same as stated after profit adjustment.*

OCTOBER

17

OCTOBER

18

This time for the Buyer, accounting for 17th October to 18th October price movement, there is a profit of ₹370. The total profit amount payable by the seller to the buyer is ₹37,000.

On the other hand, the seller is debited with ₹37,000 in his account. The balance on the seller's side now stands at ₹53,000. This will be deducted from the margin account of the seller.

DAY 3

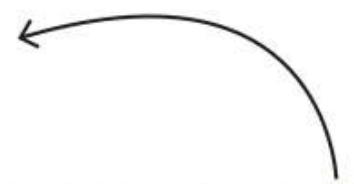
	SELLER	BUYER
Balance b/f of day 2	₹90,000	₹60,000
- Loss of ₹370 (370x 100)	(₹37,000)	₹37,000
Total balance	₹53,000	₹97,000

The balance of the Seller ₹53,000 < ₹60,000 (margin), due to which the seller is now required to add additional ₹7000 to their account to maintain the margin and keep the position.

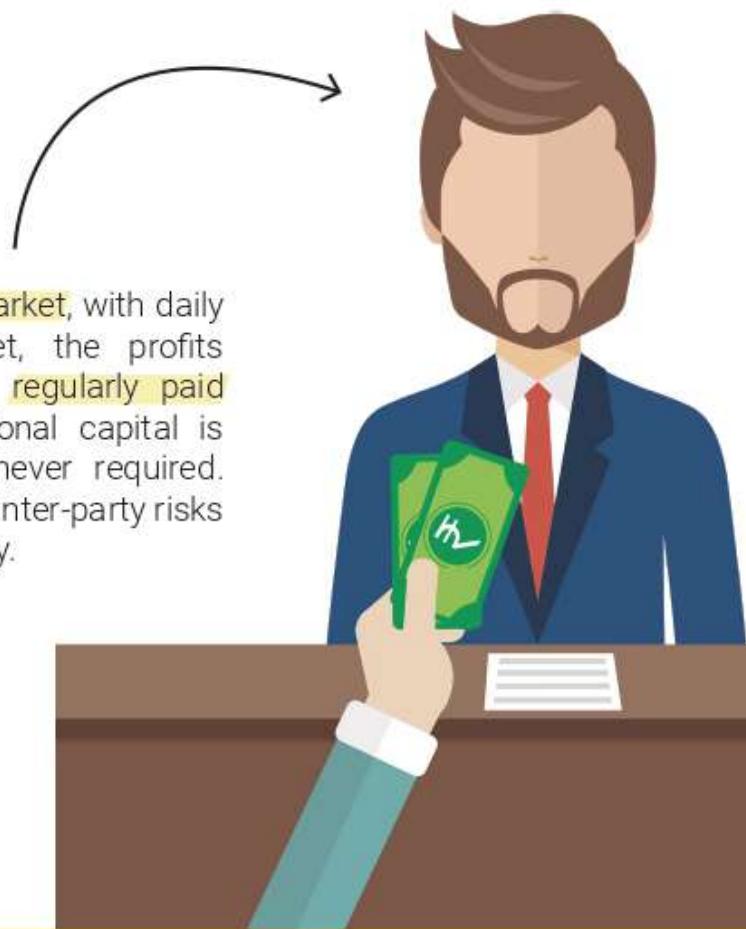
- Withdrawals	—	—
+ Additional Margins	₹7000	—
Total balance	₹60,000	₹97,000



NOTE : For the continuation of the example, let us assume that no withdrawals were made and the balance is the same as stated after profit adjustment.



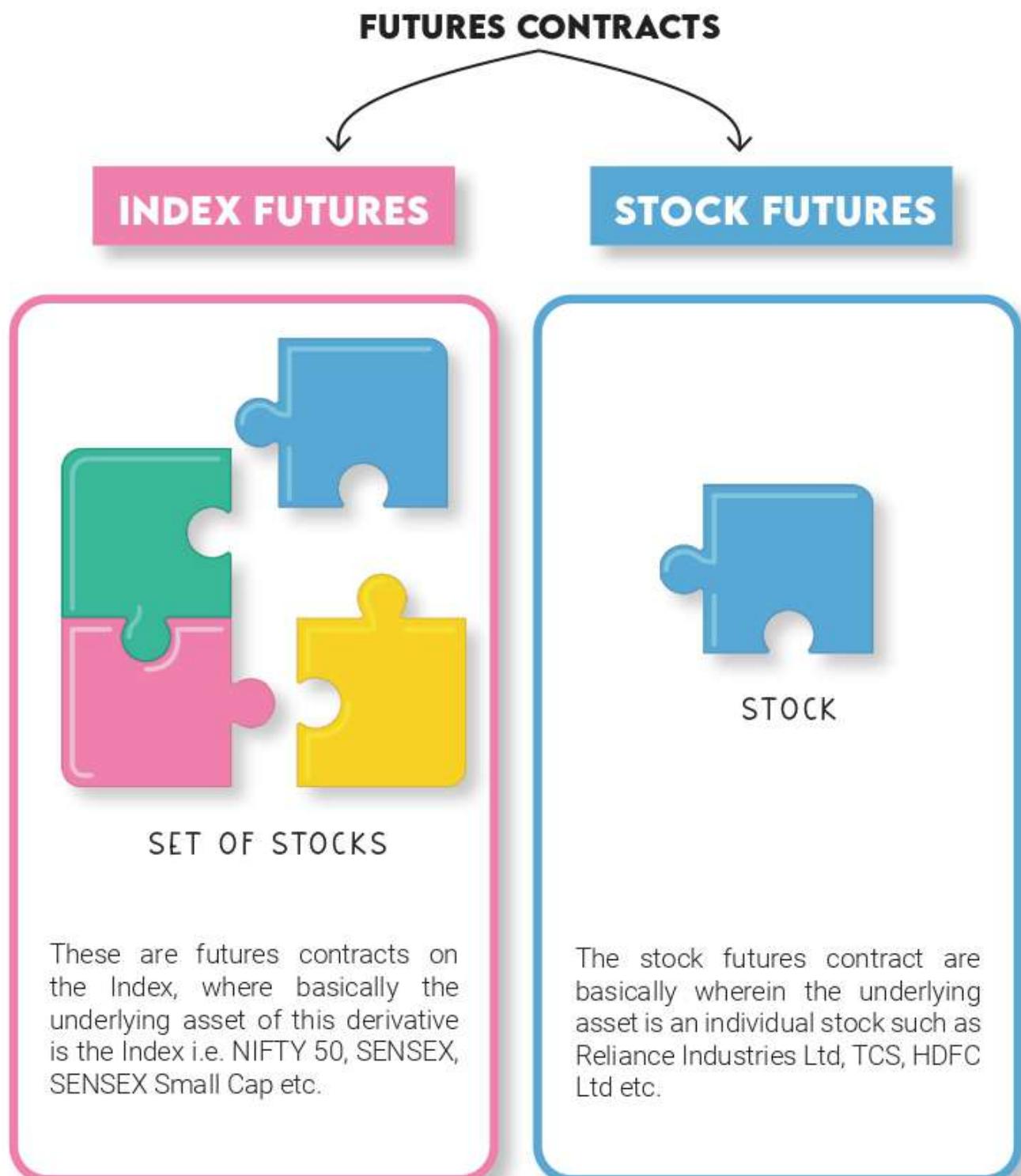
Had this been a **forward contract**, these profits and losses on each side would have been **accumulated until the maturity or expiry date** of the contract. Actual settlement would have occurred on date of maturity which would have created room for Counter-party risk.



But in **futures market**, with daily mark to market, the profits and losses are **regularly paid off**. Also, additional capital is introduced whenever required. This reduces counter-party risks quite significantly.

## 3.9 DIFFERENT FUTURES CONTRACTS

As we earlier saw that futures contracts can have different kind of underlying assets:



The market for Index futures is relatively deep which means it has a lower bid-ask spread.



Index Futures generally have higher volumes as compared to individual stocks.

Indices such as NIFTY 50 Futures, BANK NIFTY Futures, etc.



Generally, the market for Stock futures is less deep which means it has a higher bid-ask spread.

Stocks such as Reliance Futures, TCS Futures, HDFC Futures, IDFC FIRSTB Futures, Asian Paints Futures, etc.

Generally, Individual stock futures have less volumes as compared to Index Futures.

We have future contracts for currencies, commodities etc as the underlying assets too. We can build strategies to trade different asset classes. We will discuss strategies going further.

## Index Futures - BANKNIFTY

Date	Nifty bank spot Market Price	Nifty bank Futures Market Price
11 Oct 2021	38223.80	38373.45
12 Oct 2021	38521.5	38588.35
13 Oct 2021	38635.75	38718.35
14 Oct 2021	39340.90	39402.35
18 Oct 2021	39684.80	39782.45
19 Oct 2021	39540.50	39633.35
20 Oct 2021	39518.20	39654.90
21 Oct 2021	40030.20	40105.05
22 Oct 2021	40323.65	40396.40

## Stock Futures - TCS

Date	TCS Spot Market Price	TCS Future Market Price
11 Oct 2021	3687.95	3695.40
12 Oct 2021	3656.20	3662.75
13 Oct 2021	3658.05	3665.25
14 Oct 2021	3614.80	3627.25
18 Oct 2021	3649.00	3663.35
19 Oct 2021	3634.45	3649.95
20 Oct 2021	3607.95	3617.40
21 Oct 2021	3532.85	3548.40
22 Oct 2021	3501.85	3512.05

### **Some questions that you may have looking at the prices -**

Why are the Spot Price and the Futures Price of an asset not the same?

If the underlying asset through which the derivative derives its value is the same, why is there a price difference?

What does this difference tell us about the market? What causes it?



# 3.10 REASONS FOR DIFFERENCE BETWEEN SPOT PRICE AND FUTURES PRICE



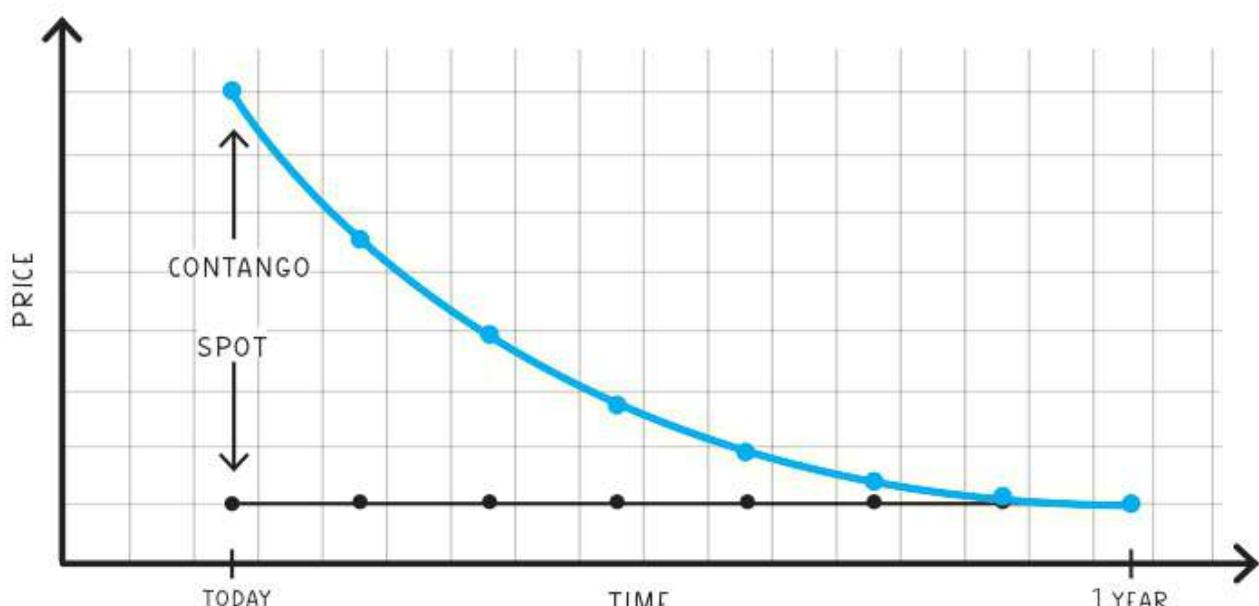
Explainer Video



You must have observed that there is a slight difference between the spot price and the futures price of assets. At times, the futures contract is more expensive than the spot price and at other times, the opposite holds true as well. This difference sometimes is such that the Futures Price is greater than the Spot Price, or vice versa shall be true. These conditions are financially called Contango and Backwardation, respectively.

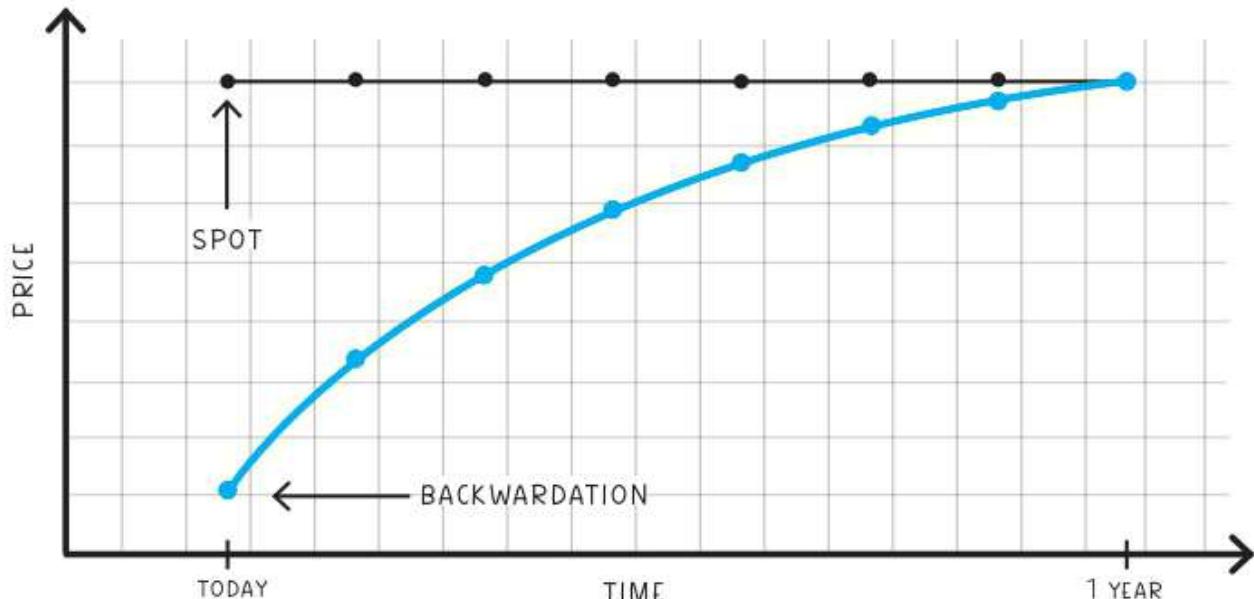
## CONTANGO

If the Futures Price > Spot Price, it is said to be a Contango market.



## BACKWARDATION

If the **Futures Price < Spot Price**, it is said to be a Backwardation market.

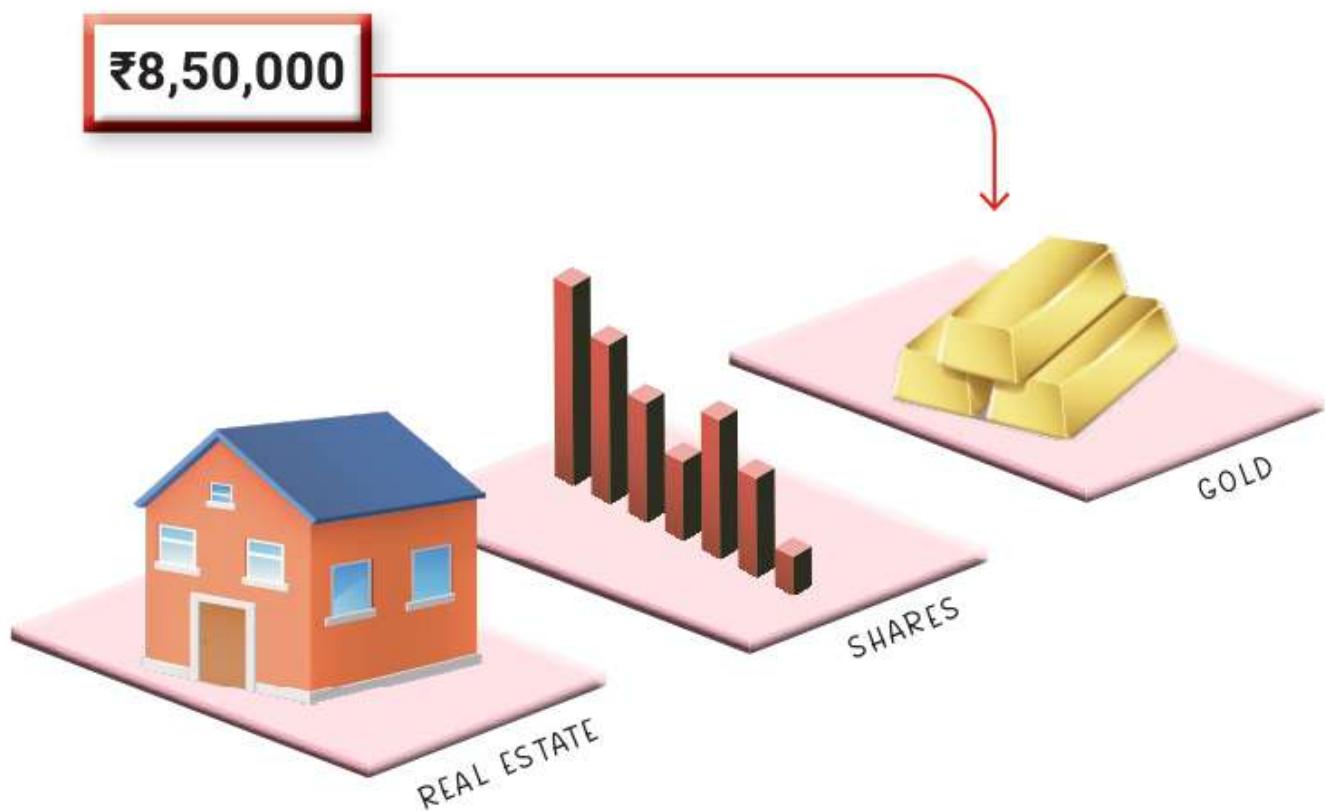


There is a difference between spot price and futures price due to the implied interest rates. When you buy a derivative contract, you only invest 15-20% as margins for the exposure. However, to buy from spot market, you will have to invest 100% of the exposure. So, the 80-85% cash that you have left when investing with Futures will earn some returns. The difference between the rates is to remove impact of such interest.



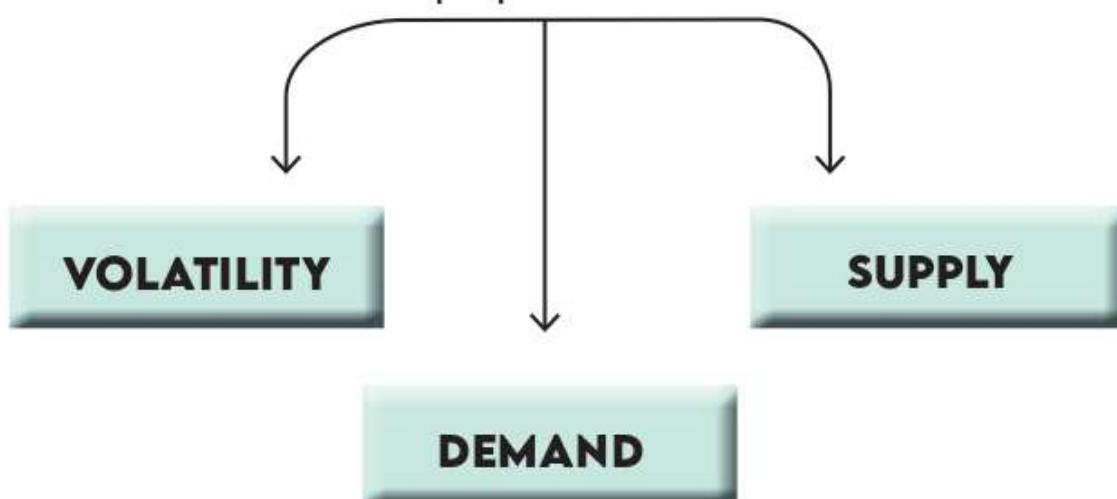
Lets say, you buy an asset worth ₹10,00,000 with 15% margin requirement. If you purchase from Spot market, entire amount will be consumed. But if you purchase from Futures market, 15% i.e. ₹1,50,000 will be consumed and ₹8,50,000 will still be idle with you.

AMOUNT CAN BE INVESTED  
IN OTHER ASSETS

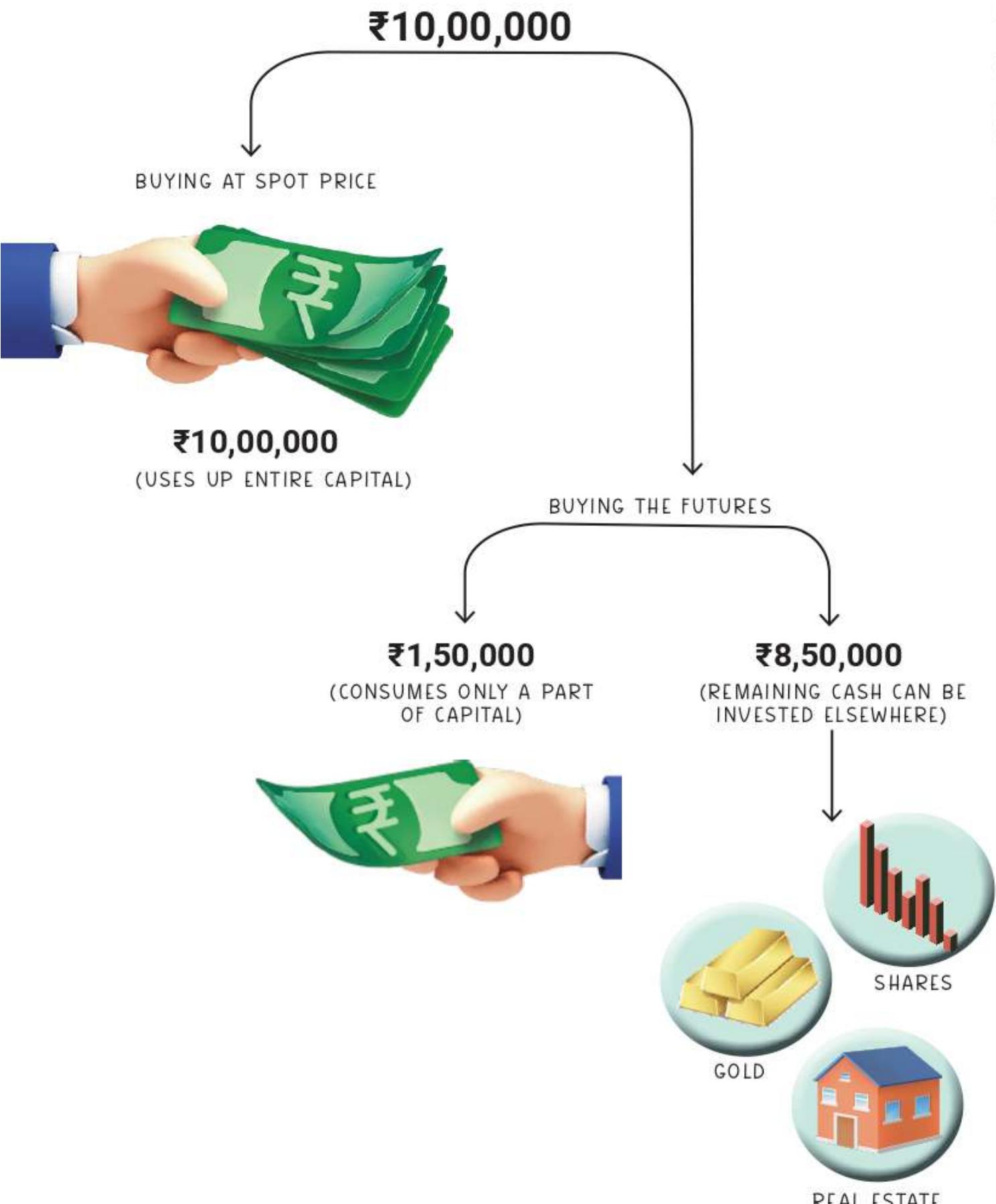


The difference ₹8,50,000, which, if invested elsewhere, would give an extra interest/return on investment. This extra earning with the leftover capital is the main reason behind the difference between TCS Spot Price and TCS Futures price. The difference ensures no one is penalized while buying at Spot or Futures prices.

#### Other reasons for Futures price and Spot price differences



## SUMMING UP THE DIFFERENCE



### **3.11 DOES THE MARKET CONVERGE TO SPOT PRICE = FUTURES PRICE ?**

Yes, indeed it does. As we come close to the expiry date of the futures contract, the difference between the spot price and futures prices starts to decrease and they converge at maturity. i.e., on expiry,  $\text{Spot Price} - \text{Futures Price} = 0$ .

The two converge towards the same point as shown in the following graph.

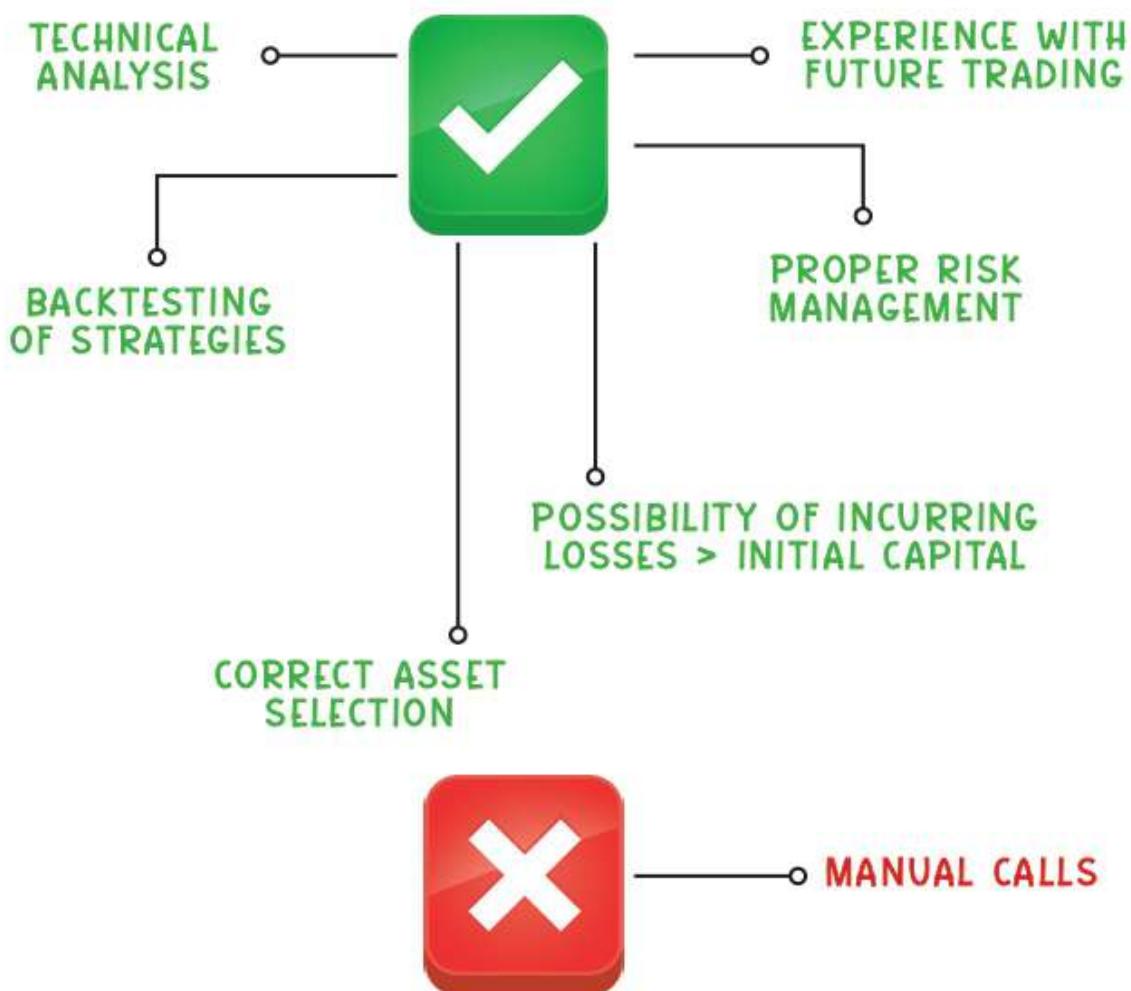


Hence, the closer the maturity/expiry date of the contract, the lesser will be the difference between the Spot and Futures Price. For instance, there is a contract that is 5-days away from its expiry date and another such contract that is 30-days away from its expiry date. The one closer to expiry will have less difference between its Spot price and Futures price in comparison to the one that expires later. So, the closer the expiry lesser the difference and vice versa.

## 3.12 CONCLUSION

We have now understood what are futures contracts, important terms related to them and how they work. We now understand them well enough to start exploring them in markets.

You need to build trading strategies using Future contracts in a manner exactly same as how you would do it for cash markets. You should combine this with Technical Analysis, Back-testing and Risk Management to start trading in Futures. Again, since you are using leverage here, you need to be extremely careful about Risk Management when it comes to Futures trading.



If these things are in place, then futures derivative is something that can be rewarding.

Options derivatives can also be combined for that matter for good risk management strategies. Again, you really need to be careful when exploring Futures as they are highly leveraged and can cause large profits and very large losses in a very short period of time.

## **CHAPTER 4**

# **COMPARISON OF FORWARDS AND FUTURES CONTRACTS**

- 4.1 Introduction**
- 4.2 Similarities of forwards and futures contract**
- 4.3 Difference between forwards and futures contract**
- 4.4 Conclusion**

## 4.1 INTRODUCTION

Now that we have precisely understood what are forward contracts and thoroughly discussed about futures contract, let us compare the two by having a look at their similarities and differences at ground and practical level.

FORWARDS CONTRACT

FUTURES CONTRACT



## 4.2 SIMILARITIES OF FORWARDS AND FUTURES CONTRACT

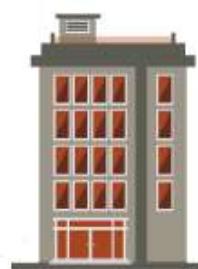
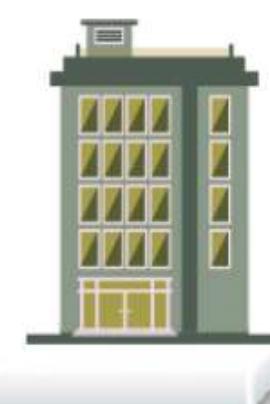
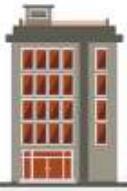
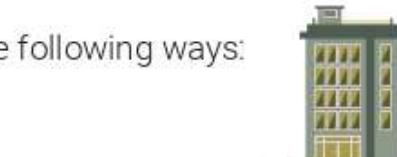


The two derivatives, forwards and futures are similar in the following ways:

# 1

## WIDESPREAD MARKET

Both futures and forwards are commonly used across different economies and different types of markets and are well understood and used globally for different purposes.



# 2

## EXTENSIVE RANGE OF UNDERLYING ASSET

Both forwards and futures have an extensive range of underlying assets on which they can be formed. These include:



STOCKS



CURRENCY



COMMODITY



PRECIOUS METALS



BONDS



## 3

### OBLIGATION TO HONOUR THE CONTRACT.

Forward as well as futures contracts are both legally binding agreements in the eyes of law. The parties involved in the agreement, the buyer (Long Position holder) and the seller (Short Position holder), are equally obligated to honour the contract as agreed.

## 4

### LOCK AT AN AGREEABLE PRICE

Both forwards and futures contracts have the feature to lock an agreeable price between the parties today on which the transaction would take place on the future date.



## 5

### SUITABLE FOR HEDGERS

Forwards and futures are effective financial instruments for reducing one's exposure to price fluctuations in the near future. They both are suitable for hedging purpose.

## 4.3 DIFFERENCE BETWEEN FORWARDS AND FUTURES CONTRACT

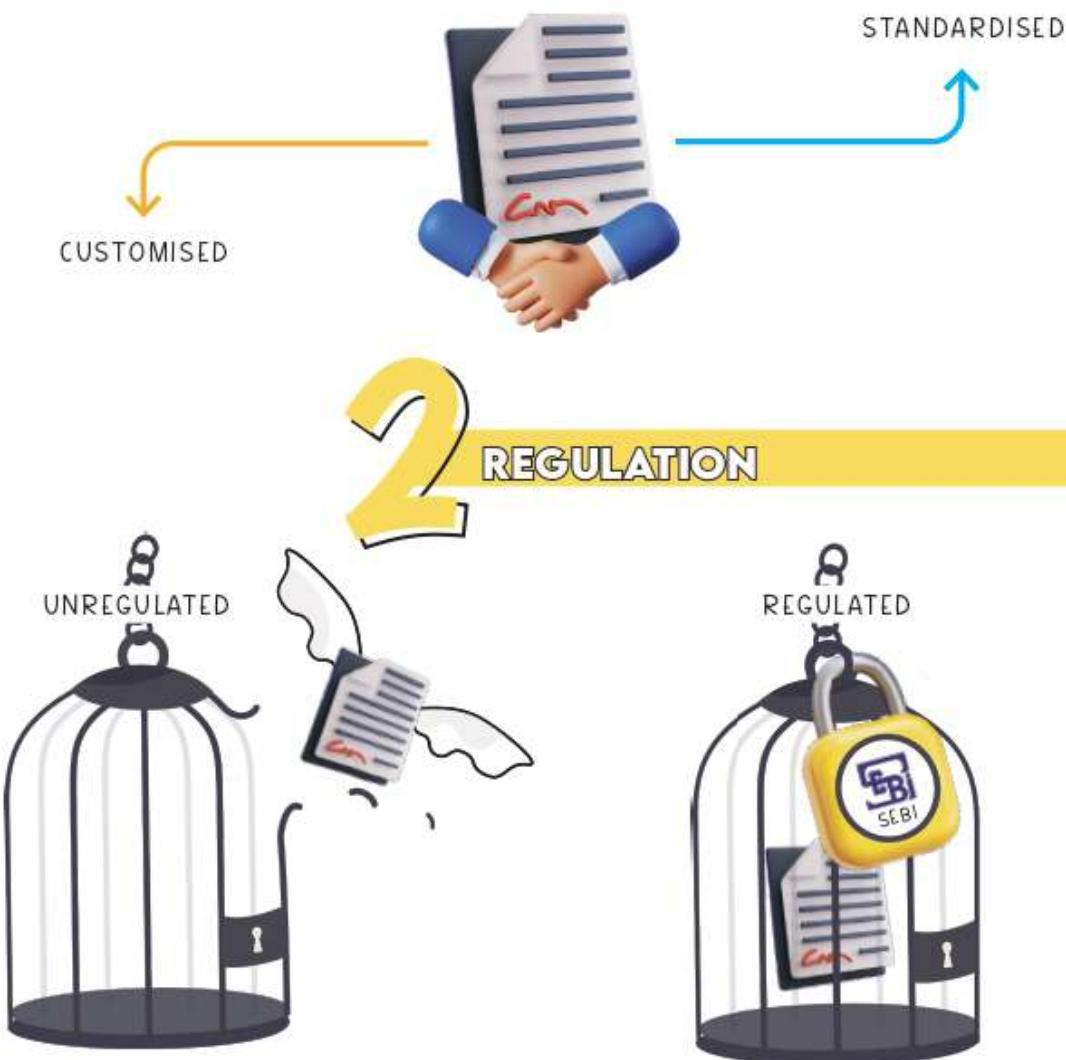


While the purpose that the two contracts serve is similar to each other yet the internal working and features of the two make each of these contracts unique for traders that use them.

## STANDARDISATION

**Forward contracts** are customisable contracts as per the precise requirements and terms that are agreeable to both the buyer and the seller of the contract.

**Futures contracts**, on the other hand, are standardised contracts that are created by the exchange.

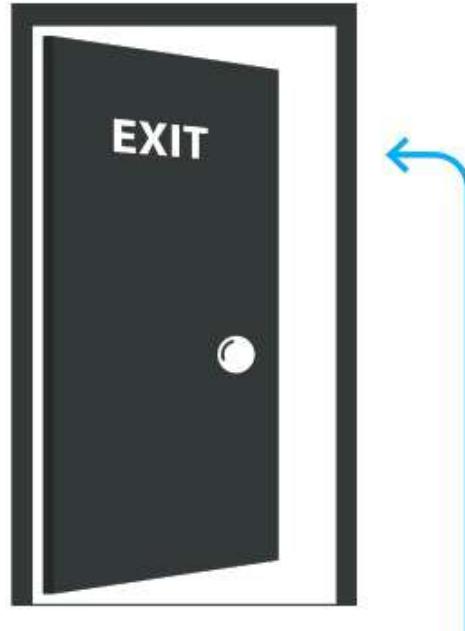
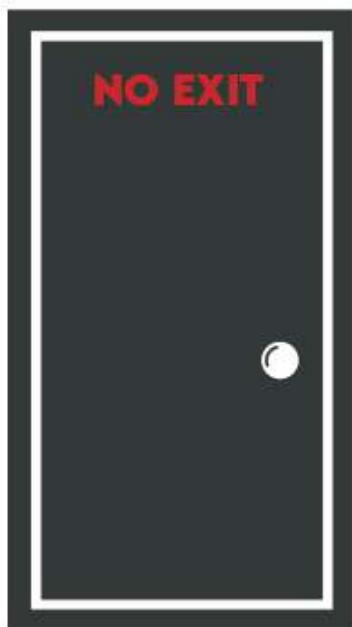


**Forward contracts** are contracts that trade in private over-the-counter markets. They are independent of the exchange regulations.

**Futures contacts**, on the contrary, are contracts that explicitly trade on the exchange and are well regulated as per the guidelines of Securities and Exchange Board of India (SEBI).

## 3 SQUARING OFF

As **Forward contracts** are over the counter contracts, it may at times be difficult to find a party to square-off our position before the settlement date.



**Futures contracts**, however, can be exited before the settlement date by simply squaring off the position in the market as they are exchange traded contracts.

## EXISTENCE OF COUNTERPARTY 4

In the market of **forward contracts**, it might get difficult at times to even find a counterparty that would be interested to enter the contract with similar or same terms desired. This can be very time consuming and costly for that matter.



In the **futures contracts** market, counter-party is found via Exchange. At times, there may be illiquid markets for certain contracts. Relatively, its a smoother process though.



## 5 SETTLEMENT

In a **forward contract**, physical delivery is one of the options that can be exercised. Cash settlement is also acceptable in forwards.



**Futures contracts** are exchange traded and therefore do not have the option of physical delivery of the underlying asset (say an agricultural product). They are settled in cash only.

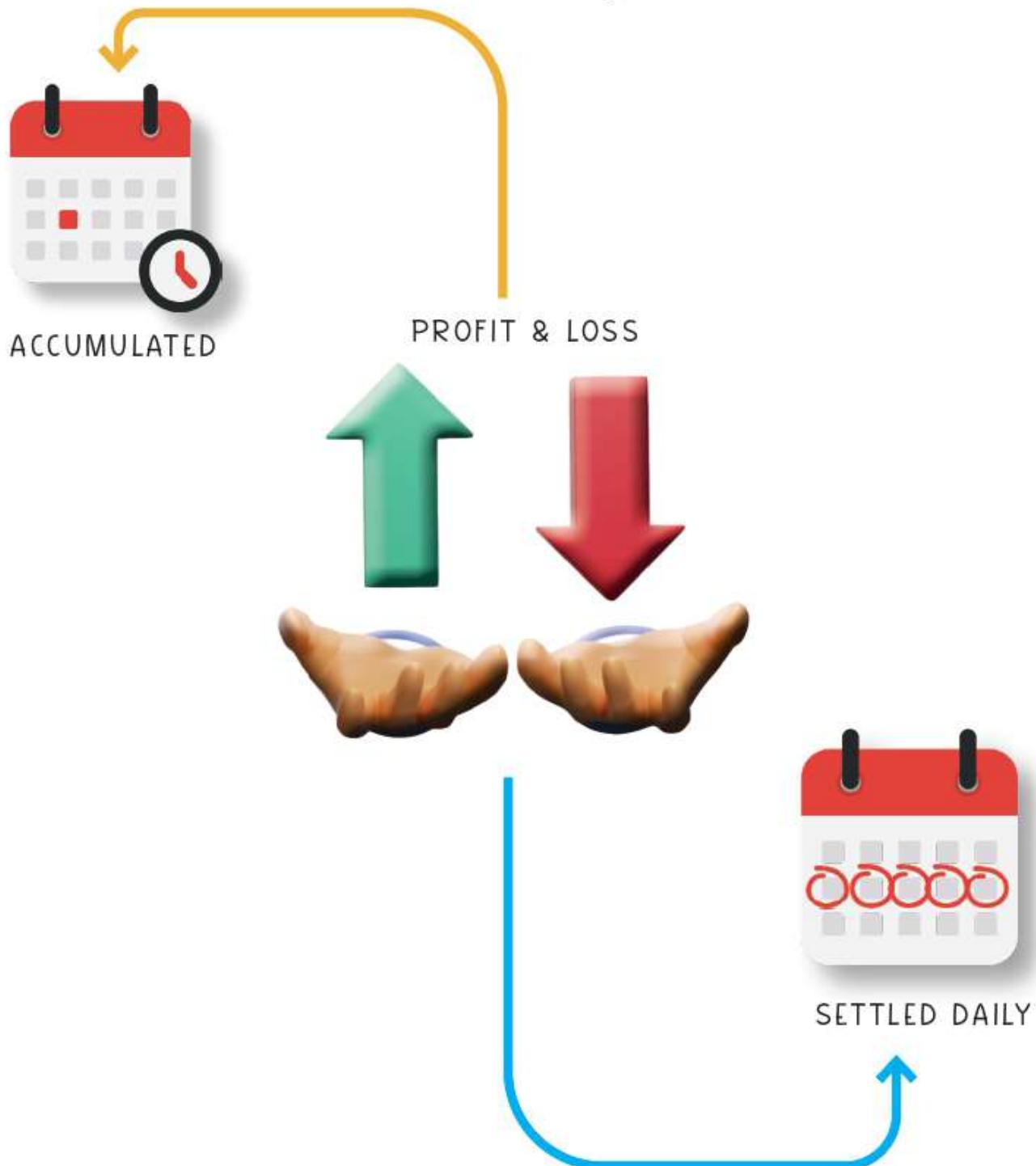


## MARKED TO MARKET



In a **forward contract**, the profits or losses of the parties are accumulated and paid on the date of maturity or expiry of the contract.

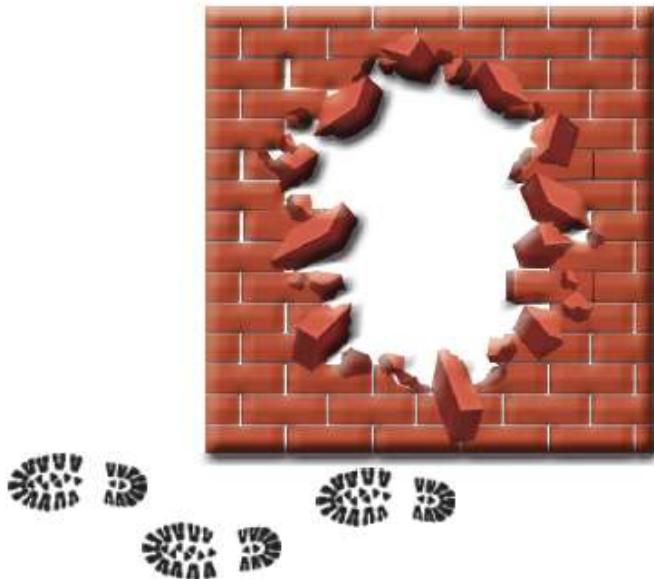
On the contrary, in a **futures contract**, the daily price movements are noted and marked to market. The profit or loss is netted between the parties on daily basis.



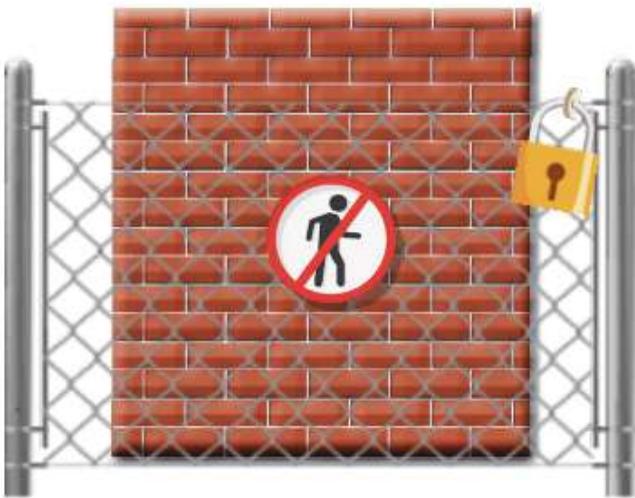
# 7

## COUNTERPARTY DEFAULT RISK

In a **forward contract**, there is a significant counterparty default risk involved even though the parties know each other.



Talking of the mark to market nature of **futures**, these contracts have no default risk.



The contract is legally binding but the legal proceedings themselves are all the more time consuming and expensive to proceed with.

The buyer and the seller have the exchange as their counterparty. This removes the counter-party risk which was there with Forward contracts.

## 4.4 CONCLUSION

The characteristics of each of these derivative contracts is to suit particular needs to different parties.

The two meet similar hedging and speculative purposes, but the way the two are built and the way their markets work are really different.

Futures is a more formal market with daily mark to market requirements whereas Forwards are relatively less formal as a market and can be customized as per the needs.

We can trade in both. However, for most readers of this book, it would be more convenient and suitable to trade using Futures contracts over forwards.

# Notes

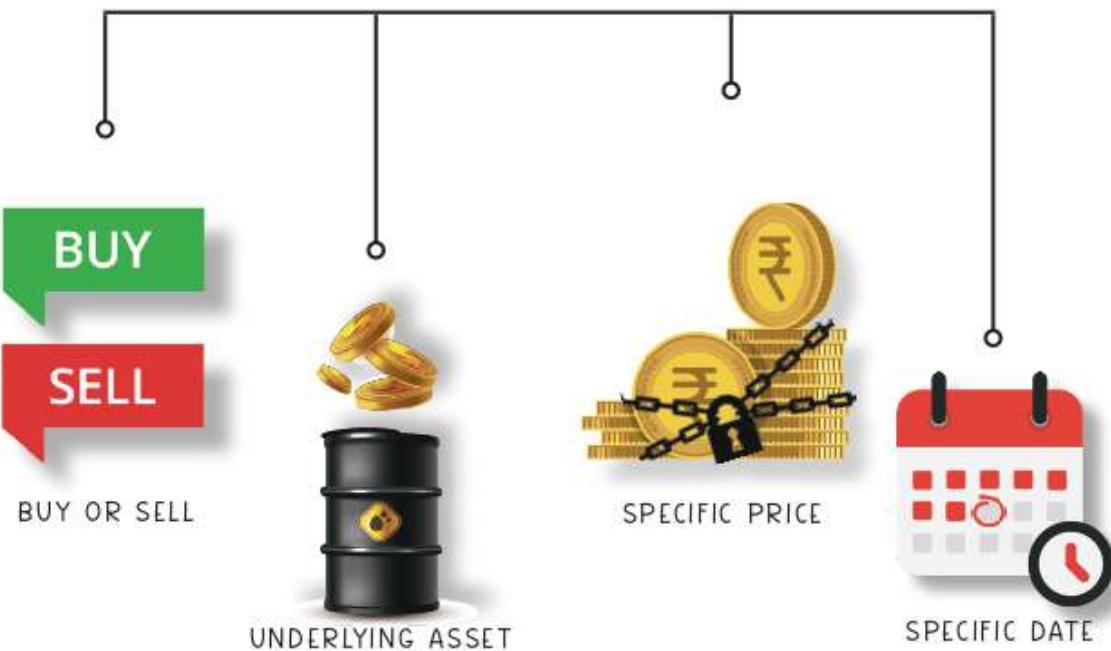
## **CHAPTER 5**

# **FUNDAMENTALS OF OPTIONS CONTRACTS**

- 5.1 Introduction**
- 5.2 Important terms to understand Options Contract**
- 5.3 What does an options contract quotation look like ?**
- 5.4 How does an options contract work?**
- 5.5 Moneyness of options contract**
- 5.6 Option payoffs**

## 5.1 INTRODUCTION

“ OPTION CONTRACTS ARE DERIVATIVE CONTRACTS THAT GIVE THE BUYER A RIGHT BUT NOT A COMPULSORY OBLIGATION TO BUY OR SELL AN ASSET AT A SPECIFIC PRICE ON A SPECIFIC DATE. ”

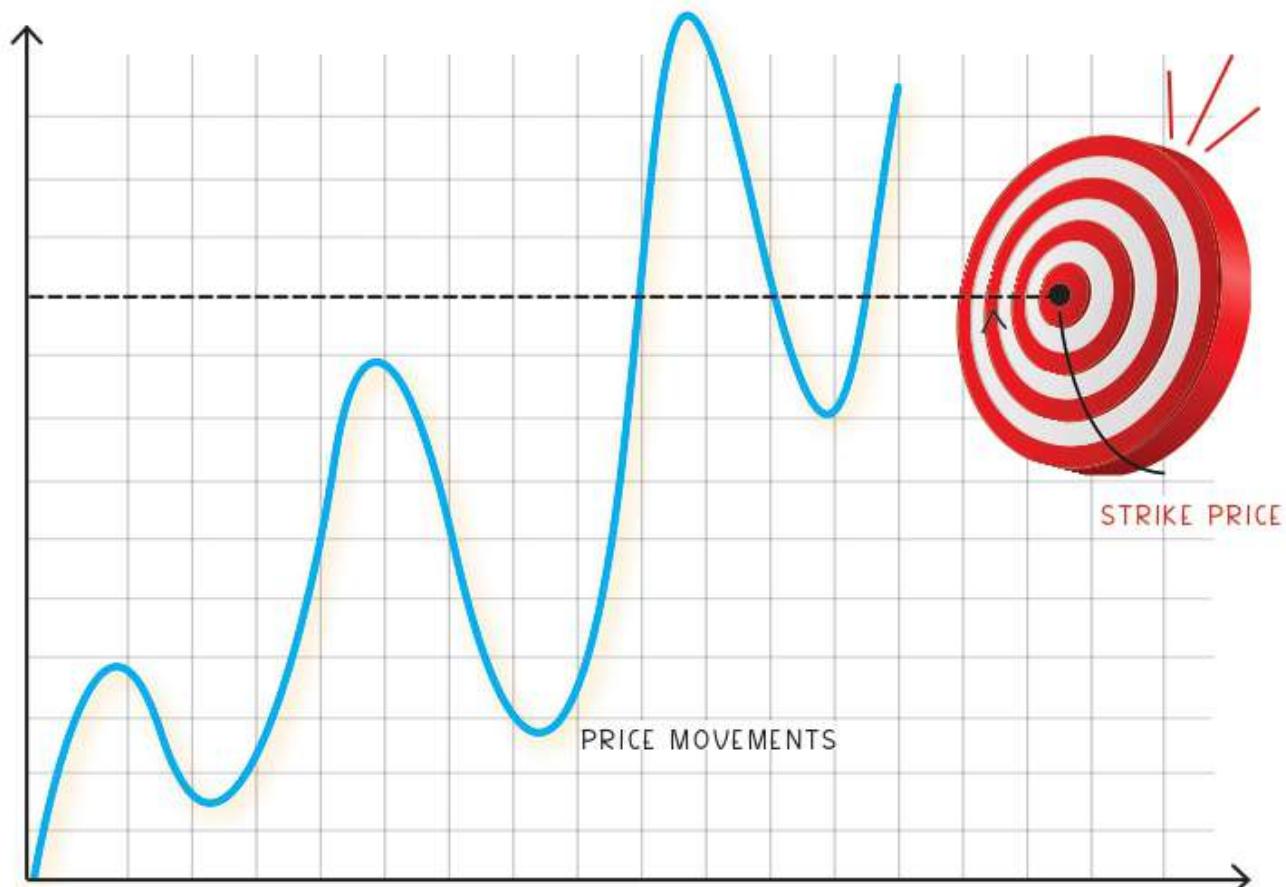


**For example**, lets say it gives the buyer the right to buy an asset for ₹110 on expiry. Now if on expiry the price is ₹115, the buyer of the option can exercise it and still buy the asset at ₹110 and profit by ₹5. If the market price on expiry is ₹100, then they can let the option expire and not exercise the same. We will see how this works exactly in this chapter.



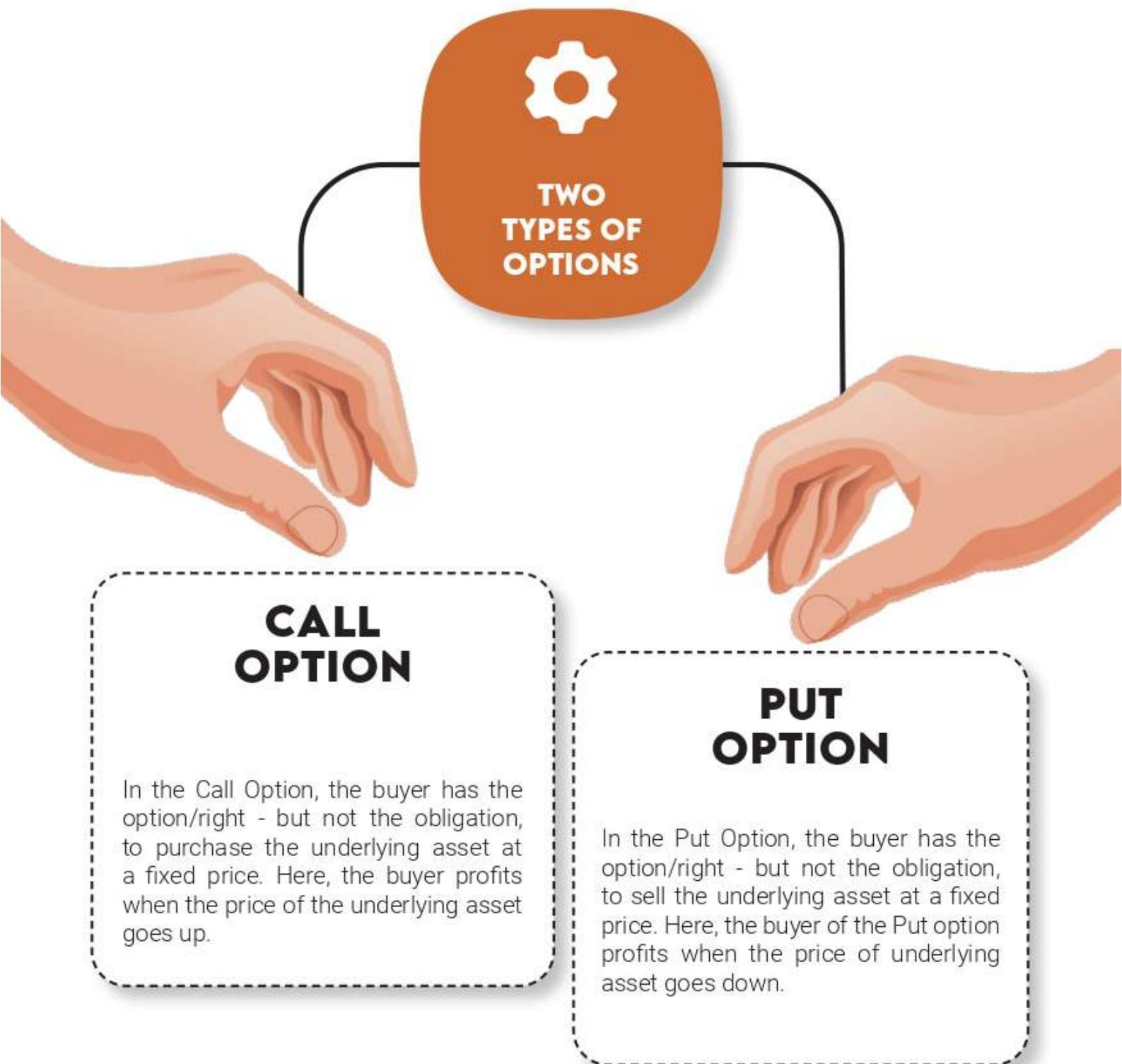
An important thing to note here is that Option Contracts, as the name suggests, give an option to buy or sell the underlying asset. The buyer of the contract may or may not exercise this right to buy or sell the underlying asset even at the date of expiry of the contract.

Option contracts are created around different strike prices. **Strike Price** refers to the price at which, as per the contract, the asset can be bought or sold on expiry. In the previous example, the strike price was Rs. 110. Strike price is extremely important to understand options as it changes the entire strategy, price of option and its pay-off.

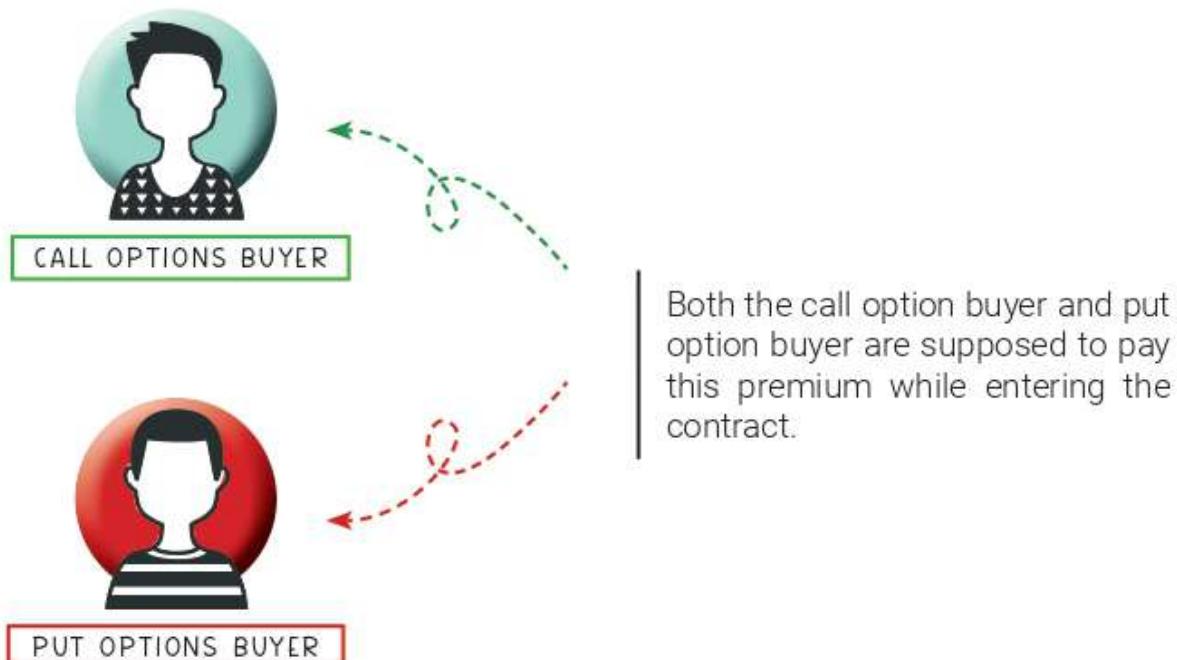


Do not get overwhelmed if you do not understand options right away. It takes time to understand the same. By the end of this chapter, you will understand them and how they work in great detail.

Options contracts are of two types, as mentioned earlier, call options, and put options, and we would be understanding the Payoffs and payoff charts of both, call options and put, in-depth shortly.



To enter into such a contract where the buyer of the option has the right but not the obligation to buy or sell an asset at a specific price, the buyer needs to pay a certain amount to the seller. This amount is called Options Premium or the cost of the option. After paying the option premium, the buyer of the option is not required to pay anything further in any circumstance i.e. they have limited their losses.



The premium amount is the risk taken by the Options buyer to enter into a contract where they get the right but not the obligation to buy or sell. In theory this might look like a very good position to be in with limited losses and unlimited profits, but in reality, it has to be really understood well to profit from these. We will understand the profitability under different circumstances when we learn about Option payoff charts.



**STRIKE  
PRICE**

**EXERCISE  
PRICE**

**LOT  
SIZE**

**BID**

**ASK**

**SPREAD**



**EXPIRY**

**PREMIUM**

## **5.2 IMPORTANT TERMS TO UNDERSTAND OPTIONS CONTRACT**

Let us begin with understanding some standard terms used in the Option Contracts.



**BREAK  
EVEN  
POINT**

**OPEN  
INTEREST**

## STRIKE PRICE

STRIKE PRICE REFERS TO THE PRICE AT WHICH THE BUYER OR SELLER HAS THE RIGHT TO BUY OR SELL THE ASSET IN THE FUTURE AS PER THE CONTRACT. STRIKE PRICE IS THE PRICE THAT DETERMINES THE PROFIT OR LOSS ON THE POSITION.

**For instance**, if we have a call option strike price at ₹2100 and at the time of expiry the price is ₹2900, then the difference of ₹800, calculated from the strike, would be the payoff.

Had the strike price been ₹2500, then the payoff would have been ₹400 instead of ₹800



## EXERCISE PRICE

Exercise price of an option is the price of the underlying asset on the expiry date of the contract. The difference between the exercise price and the strike price determines the profit or loss in an option contract.



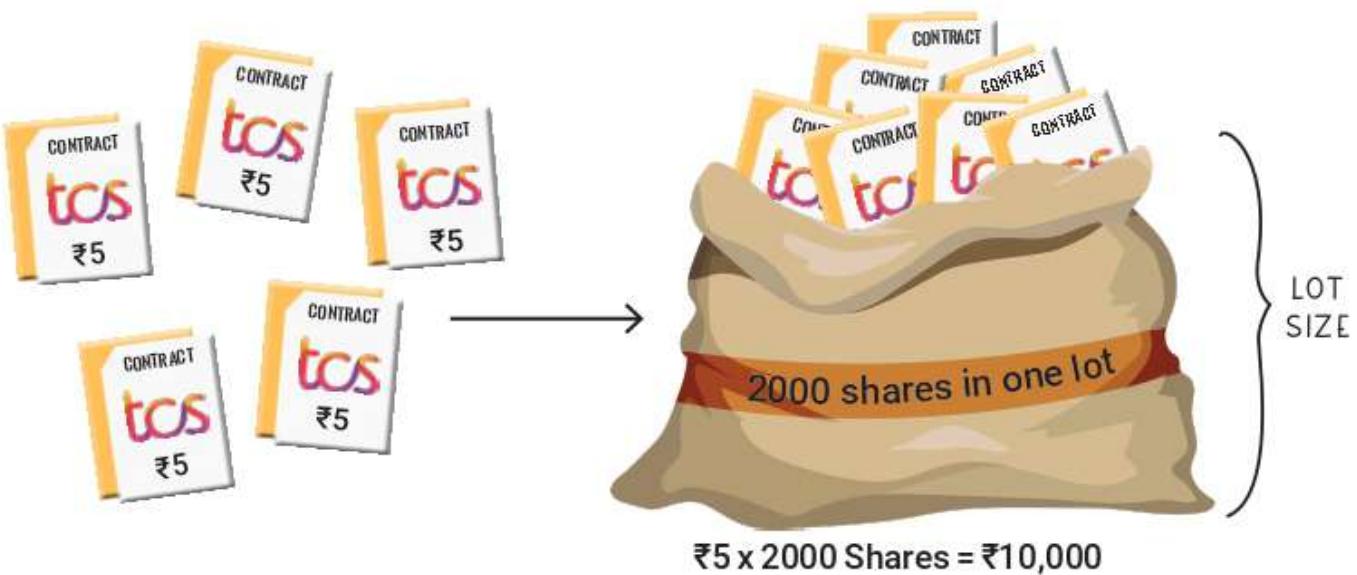
## EXPIRY

Expiry Date refers to the date till which the option contract is valid. The price of the underlying asset on this particular date forms the Exercise Price. In India, expiry for shares related options happens to be the last Thursday of each month.



**DATE OF EXPIRY**  
LAST THURSDAY OF THE MONTH

## LOT SIZE



Single option contracts cannot be purchased. They have to be bought and sold in lots. The number of contracts in each lot determines the Lot size.  
So, if an option contract is worth ₹5 and has a lot of 2000 contracts, then each lot costs ₹10,000.

## PREMIUM



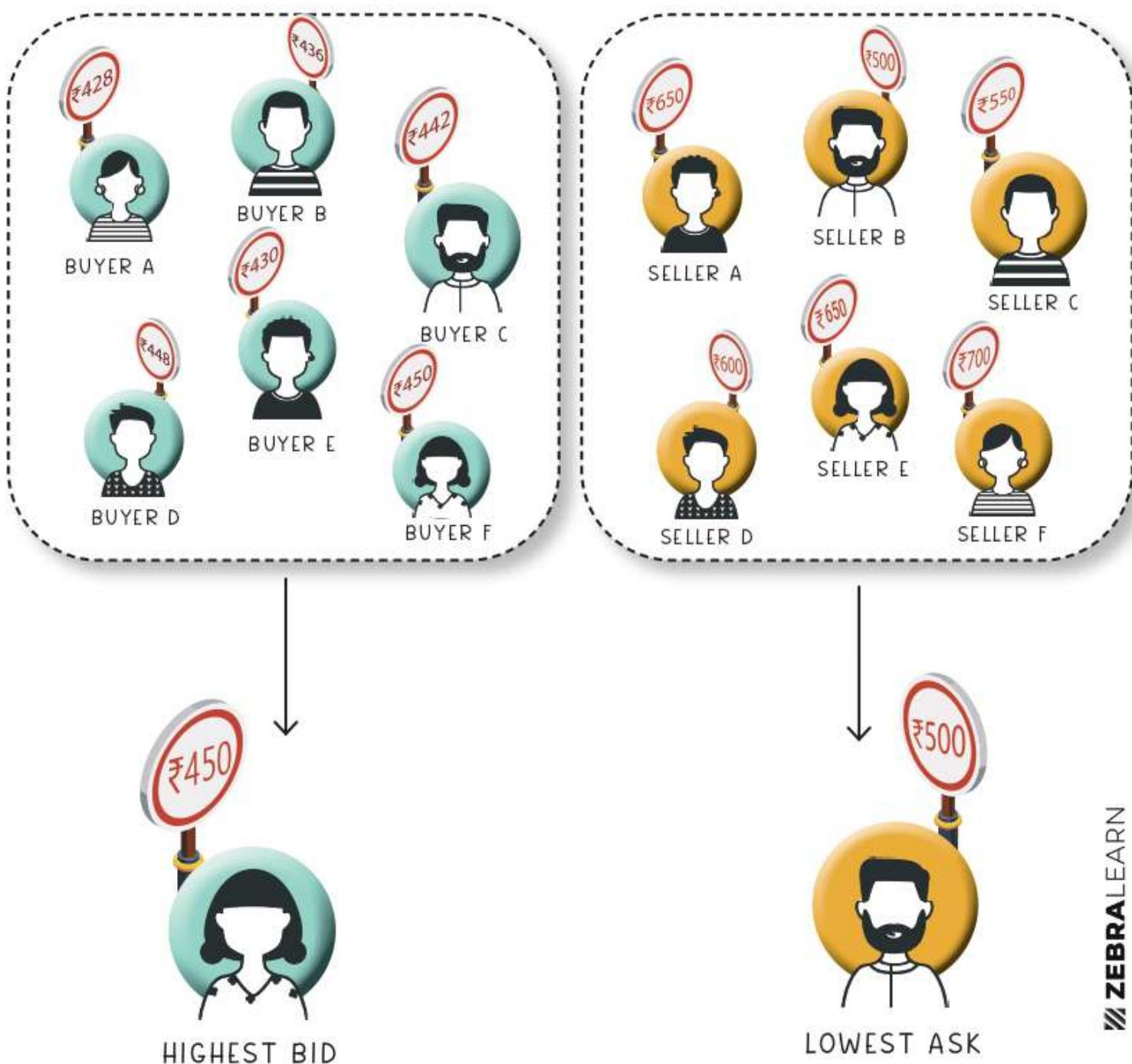
The premium is the price that the buyer pays to enter the contract. Premium is the cost of the option or the right that the buyer is purchasing. Premium paid determines the profitability of any option strategy. We will learn more about these when we discuss payoff charts.

## BID

## ASK

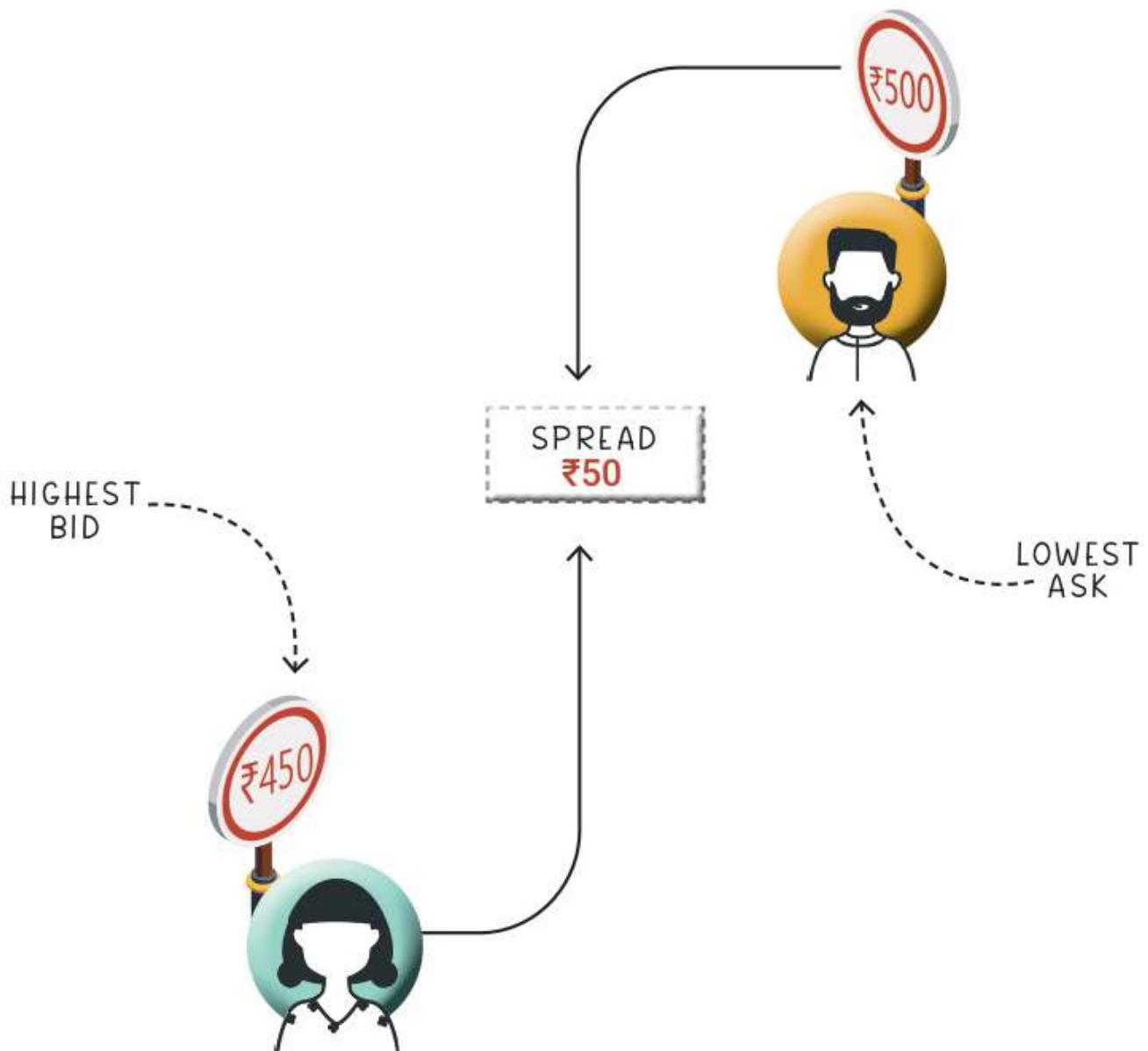
Similar to Futures, options are also sold in Auction model. The highest that a buyer is willing to pay, is called the Bid Price in the market. Any seller wanting to sell immediately will have to sell at this price.

Ask Price is the lowest price at which a seller is ready to sell the option contract. A buyer looking to buy immediately will have to pay the Ask Price.



## BID-ASK SPREAD

The spread is the difference between the bid and ask price of an asset. The buyers want to buy at the lowest and the sellers what to sell at the highest possible price. This is why there is a spread between the two.



Bid-Ask spread can be low or high depending on the liquidity of the market. If the market is liquid i.e. it has lot of buyers and sellers, then the bid-ask spread would be thin i.e. low. If there are limited number of buyers and sellers, then the bid-ask spread would be high. Bid-ask spread adds to transaction costs when executing any strategy.

## OPEN INTEREST

Open Interest refers to the total number of options that currently exist in the market at different strike prices for any particular underlying asset.

**For example,** TCS will have different number of call options and put options at different strike prices. This is called Open Interest at different strike prices.

Series Total Open Interest: **29,476,575**

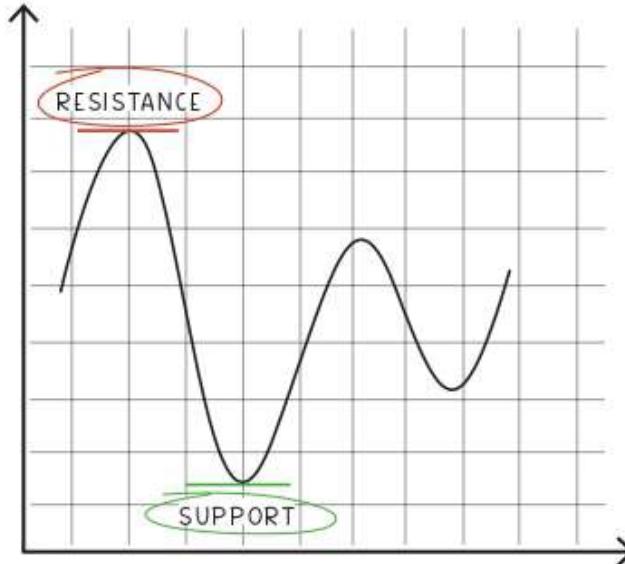
Today's Change in OI: **4,914,128**

Expiry: **2 JUL 2020**

Instrument and Spot Price: Underlying Index **NIFTY 10574.50** As on Jul 02, 2020 13:43:57 IST

**Option Chain (Equity Derivatives)**

Chart	CALLS										PUTS													
	OI	Chng in OI	Volume	IV	LTP	Net Chng	Bid Qty	Bid Price	Ask Price	Ask Qty	Strike Price	Bid Qty	Bid Price	Ask Price	Ask Qty	Net Chng	LTP	IV	Volume	Chng in OI	OI	Ch		
ITM	87,525	-59,775	2,226	-	566.00	+32.35	75	563.50	565.30	375	10000.00	14,375	0.15	0.20	394,725	-3.60	0.15	-	102,503	-269,175	3,157,650	OTM		
ATM	10,350	600	41	-	500.00	+17.70	525	513.90	516.60	150	10050.00	77,025	0.15	0.20	60,600	-4.20	0.15	-	18,440	-59,475	372,075	ATM		
OTM	91,050	-27,325	1,822	-	467.85	+131.50	75	463.00	466.65	150	10100.00	213,150	0.15	0.20	137,775	-5.05	0.15	-	71,120	-69,675	1,593,000	ITM		
ITM	28,800	-900	237	-	416.90	130.40	75	413.45	416.65	150	10150.00	151,650	0.15	0.20	11,925	-6.55	0.15	-	50,377	39,225	849,600	OTM		
ATM	251,925	-133,800	7,912	-	365.30	123.80	150	363.95	365.55	150	10200.00	327,000	0.20	0.25	79,125	-8.90	0.20	-	211,545	1,501,425	3,902,250	ATM		
OTM	87,225	-22,725	2,754	-	317.25	124.45	750	313.75	315.40	150	10250.00	163,500	0.30	0.35	37,275	-12.60	0.30	-	155,820	1,212,300	2,190,750	OTM		
OTM	552,075	-426,075	39,727	-	264.65	112.15	75	264.90	265.55	75	10300.00	242,100	0.30	0.35	190,725	-19.05	0.35	-	484,604	2,402,775	5,915,850	OTM		
ATM	173,625	-103,250	15,484	-	216.00	103.75	75	214.30	215.25	150	10350.00	102,000	0.35	0.40	83,775	-29.20	0.40	-	349,737	1,635,900	2,610,825	ATM		
ATM	683,475	-1,170,250	214,744	-	164.85	87.00	150	164.75	165.40	75	10400.00	88,050	0.55	0.60	91,575	-44.80	0.60	-	840,854	4,135,350	6,274,875	ATM		
OTM	462,675	-443,250	198,849	-	115.00	64.35	75	115.95	116.50	75	10450.00	6,450	1.20	1.25	450	-66.15	1.25	-	687,996	3,501,750	3,829,350	OTM		
ATM	2,432,025	-792,750	1,009,627	-	69,20	39.60	225	69.20	69.50	150	10500.00	12,600	5.05	5.10	225	-91.30	5.10	-	1,162,291	6,257,175	6,748,950	ATM		
OTM	2,978,925	-1,936,100	961,208	-	32,70	17.40	150	32.65	32.85	600	10550.00	600	17.70	17.85	75	-113.35	17.75	-	425,680	2,842,950	2,864,400	OTM		
OTM	5,880,750	-3,296,850	1,126,678	-	10.40	3.35	1,675	10.40	10.50	975	10600.00	975	45.50	45.75	225	-126.35	45.50	-	212,456	734,700	847,050	OTM		
ATM	4,157,100	-3,180,150	547,916	-	1.75	-1.10	7,650	1.75	1.90	10,650	10650.00	150	86.55	87.10	75	-140.45	87.05	-	13,438	92,700	99,900	ATM		
OTM	3,872,850	-1,783,650	357,561	-	0.40	-1.10	37,725	0.40	0.45	33,450	10700.00	75	135.35	135.75	75	-135.00	135.50	-	14,619	75,600	103,275	OTM		
OTM	587,700	-136,050	62,126	-	0.20	-0.80	34,425	0.15	0.20	28,575	10750.00	225	184.50	185.55	75	-140.10	184.35	-	404	1,725	6,075	OTM		
ATM	1,459,425	-57,975	73,345	-	0.00	-0.75	884,350	0.05	0.10	78,975	10800.00	75	235.05	236.10	225	-129.25	235.30	-	1,168	4,275	18,375	ATM		
OTM	113,250	-19,125	5,349	-	0.10	-0.60	147,675	0.05	0.10	18,000	10850.00	225	284.35	285.80	75	-135.30	285.95	-	15	225	3,175	OTM		
OTM	880,375	-61,200	18,373	-	0.05	-0.55	350,875	0.05	0.10	65,175	10900.00	525	333.70	336.50	75	-130.00	334.85	-	137	675	9,000	OTM		
OTM	81,375	-25,875	1,612	-	0.10	-0.40	16,500	0.05	0.10	15,750	10950.00	375	383.00	386.35	600	-247.75	392.00	-	1	-	150	OTM		
OTM	2,650,200	-183,325	41,359	-	0.05	-0.45	302,100	0.05	0.10	110,550	11000.00	225	433.35	435.85	75	-136.15	432.85	-	437	1,500	14,775	OTM		
OTM	36,525	-1,370	581	-	0.05	-0.40	-	0.05	0.1575	1,1050.00	600	482.90	486.40	600	-	-	-	-	-	-	75	OTM		
OTM	270,675	-3,375	2,622	-	0.05	-0.30	-	0.05	18,750	11000.00	600	532.75	536.40	600	-	-	-	-	-	-	75	OTM		
OTM	12,300	-100	17	-	0.05	-0.25	-	0.05	1,825	11150.00	7,350	547.00	567.10	7,725	-	-	-	-	-	-	75	OTM		
OTM	421,200	-3,225	3,576	-	0.05	-0.35	-	0.05	15,825	11200.00	7,350	597.10	655.45	75	-	-	-	-	-	-	25	OTM		
OTM	10,225	-2,925	190	-	0.05	-0.25	1,350	0.05	0.10	4,950	11250.00	75	650.05	713.60	75	-	-	-	-	-	-	0	OTM	
OTM	Total <b>29,476,575</b>		<b>4,914,128</b>																<b>4,929,003</b>		<b>49,377,525 Tot</b>			
<b>TOTAL CALL OI</b>																								



Traders have trading strategies purely looking at the Open Interest at different levels too. Too high open interest for call option often denotes Resistance at that strike price and too high open interest for Put at a price denotes support levels in general.

## BREAK EVEN POINT



The price at which you make no profit no loss as a buyer or seller of option contract is called the Break-even price. So, if you have purchased a call option, the exercise price must be higher than the Break-even point to make a profit.

**For instance,**

let us say the strike of a call option is ₹2100, the premium being ₹50 and exercise price is ₹2150 at the expiry date.



₹2100  
STRIKE PRICE



₹50  
PREMIUM



₹2150  
EXERCISE PRICE

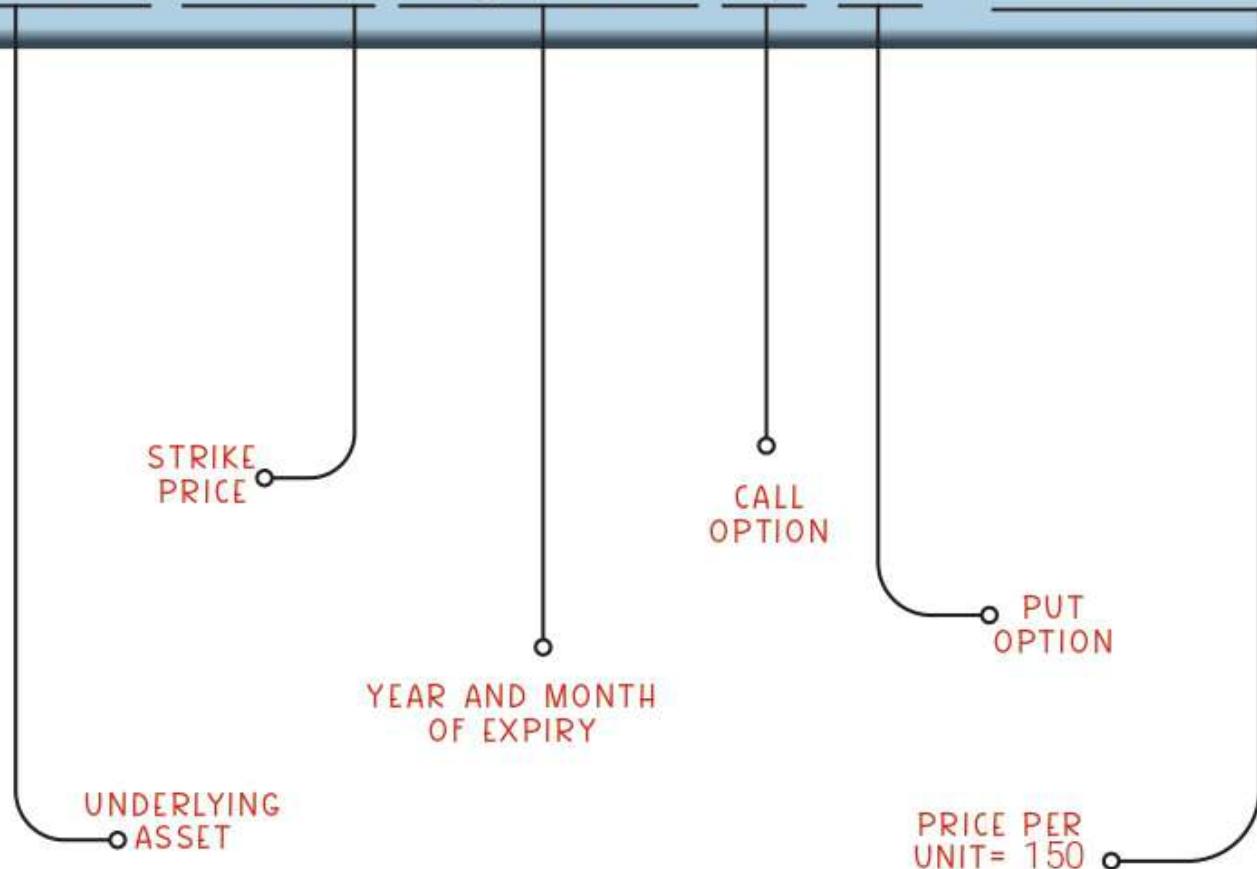
BREAK EVEN POINT  
FOR CALL OPTION =  
STRIKE PRICE + PREMIUM





## 5.3 WHAT DOES AN OPTIONS CONTRACT QUOTATION LOOK LIKE ?

**NIFTY 17500 Sep 2021 CE/PE = ₹150/unit**



**NIFTY**

**17500**

**Sep  
2021**

**CE**

**PE**

**₹150/  
unit**

Nifty refers to the underlying asset through which the derivative (option in this case) derives its value. It may be anything, Nifty, Reliance, Bank Nifty, TATA, etc.

The Strike Price is the price at which the option buyer can buy or sell the asset at Expiry date. The profit payoff is calculated from the strike price. At any given point in time, you will find options on the same asset of different strike prices.

The Month and year mentioned next, informs us about the expiry of the contract. In some cases, the date is also mentioned. In this case, it would be the last Thursday of the month of September for the year 2021.

CE = Call European = Call option of European Style

PE = Put European = Put option of European Style

If you are to buy a contract then the amount payable will be  
Price (₹150) x Lot size (say 100units) = ₹15,000.

# 5.4 HOW DOES AN OPTIONS CONTRACT WORK?



Explainer Video

In every contract there are two parties involved, one is the buyer and the other is the seller. Both parties have different objectives and obligations in the agreement.

The **Buyer** of an options contract has the right but not the obligation to exercise the options at the expiry.



RIGHT TO EXERCISE



OBLIGATION TO EXERCISE

The **Seller** of an options contract, on the other hand, sells his option/ right and has an obligation to honor the commitments on expiry.



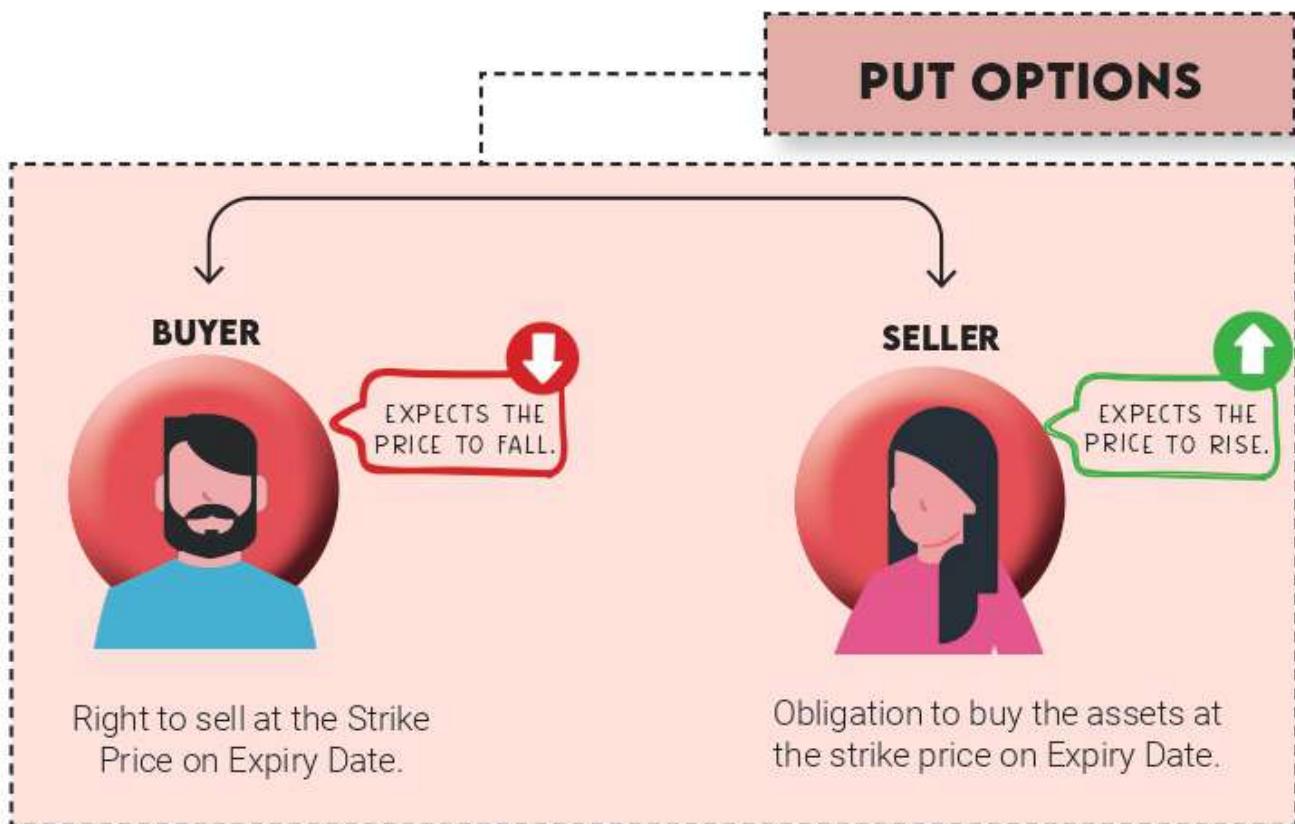
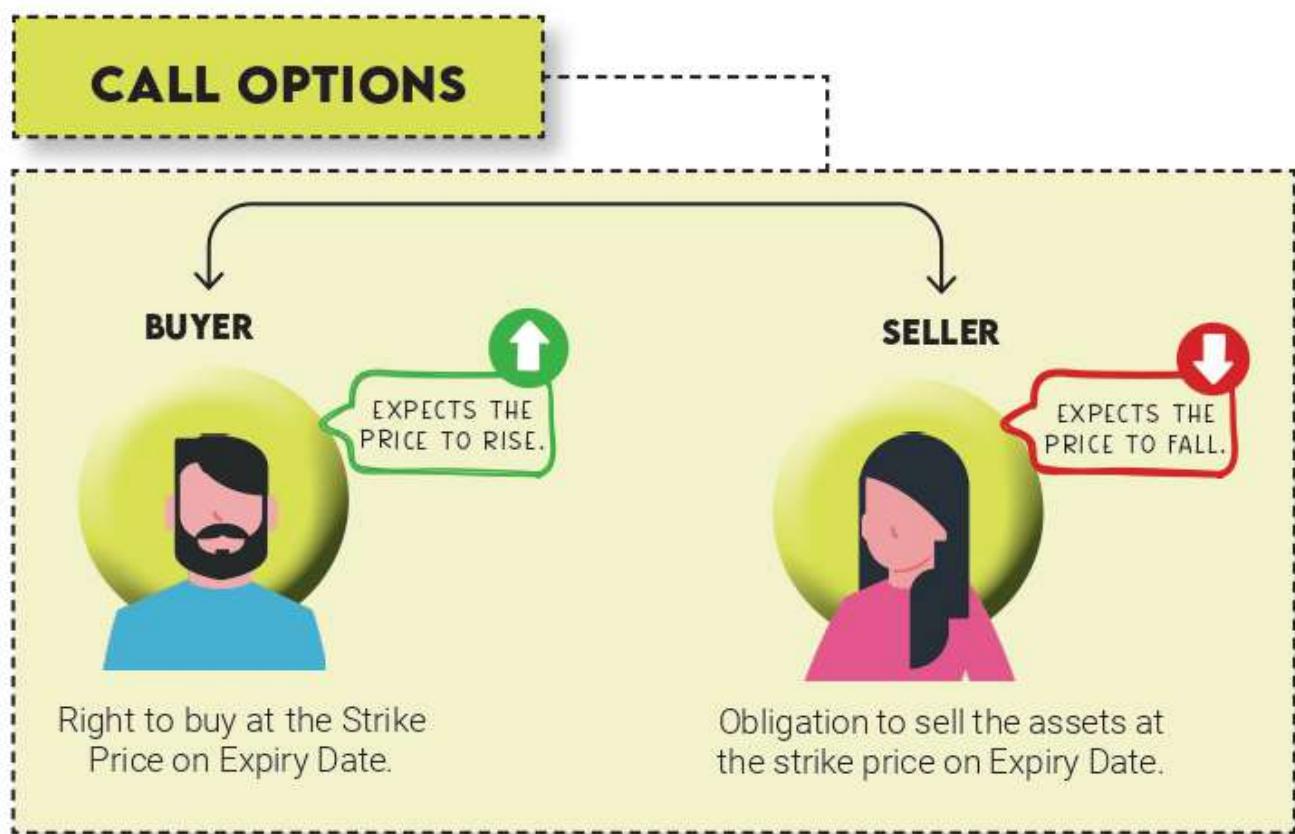
SELLS HIS OPTION/RIGHT



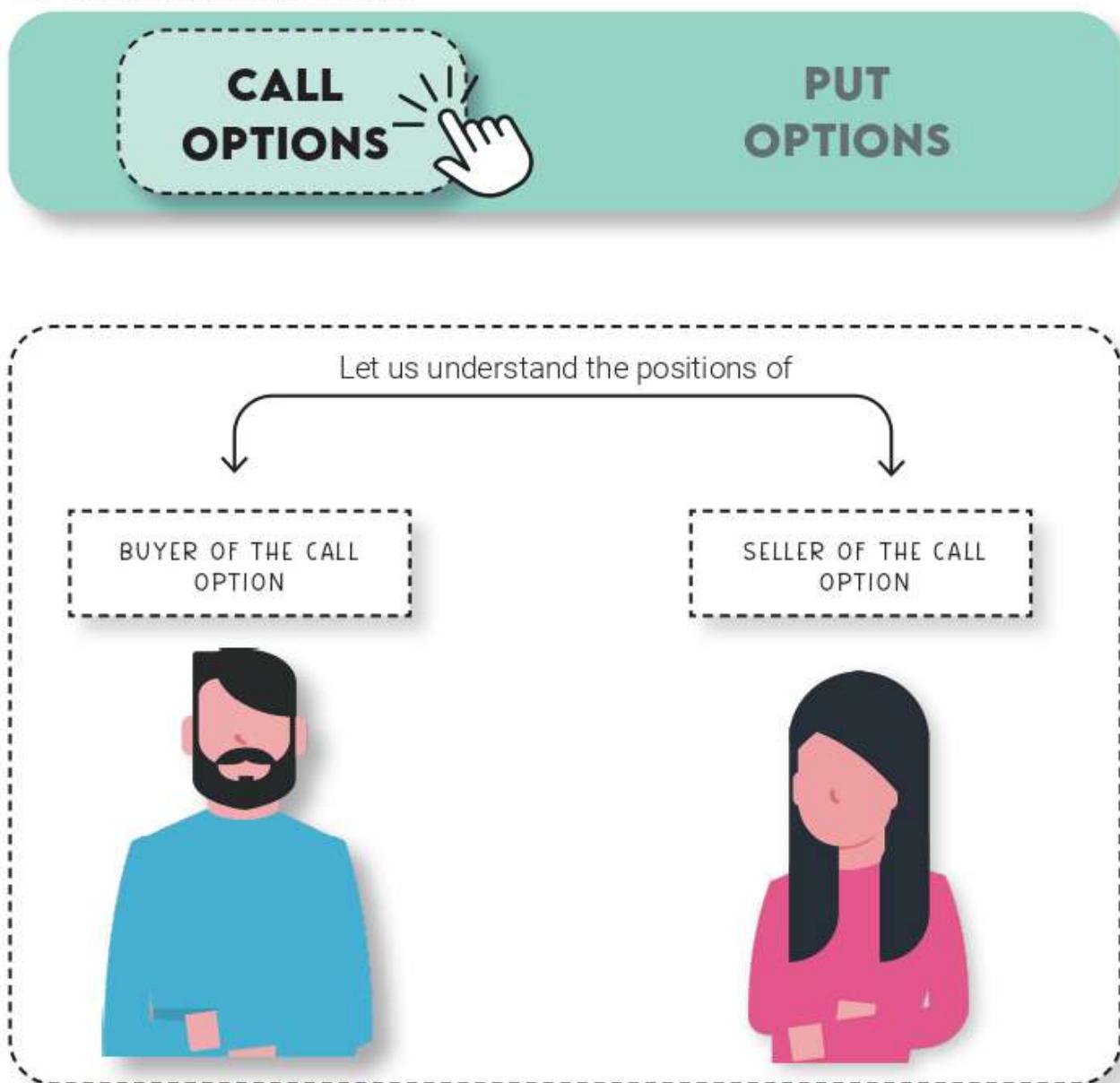
OBLIGATION TO HONOR THE CONTRACT



Let us take a scenario to understand this working relationship of buyer and seller in the Options Contract.



Let us Begin with Call Options.



**Let's say**, the buyer of the Call Option has bought an option with the Strike Price of ₹2200 i.e. CE2200.

The premium paid is ₹50 per unit.



Let's take some hypothetical figures to calculate profits for the buyer.

**SCENARIO 1**

**Market Price  
on Expiry**

**₹2100**

**SCENARIO 3**

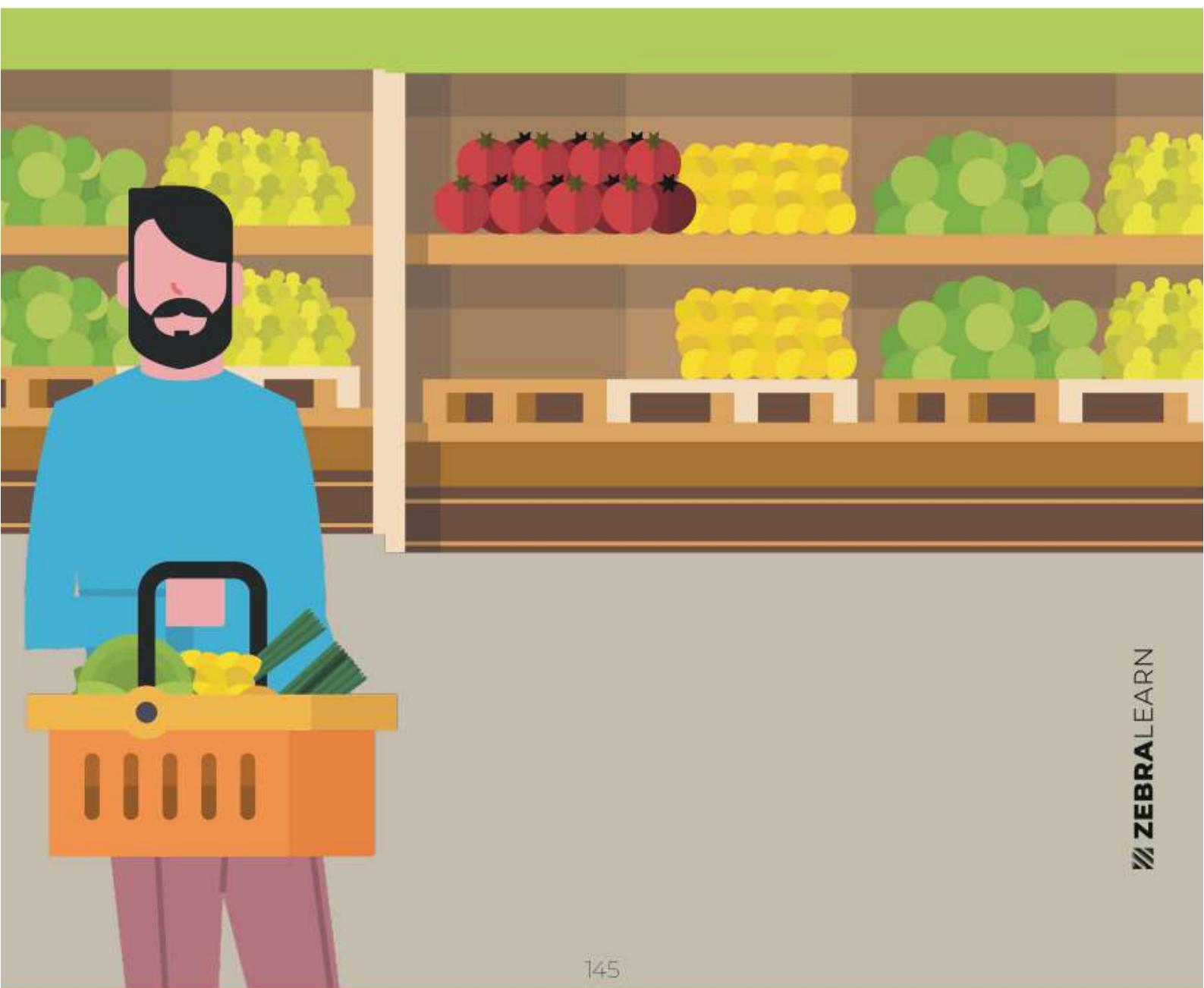
**Market Price  
on Expiry**

**₹3000**

**SCENARIO 2**

**Market Price  
on Expiry**

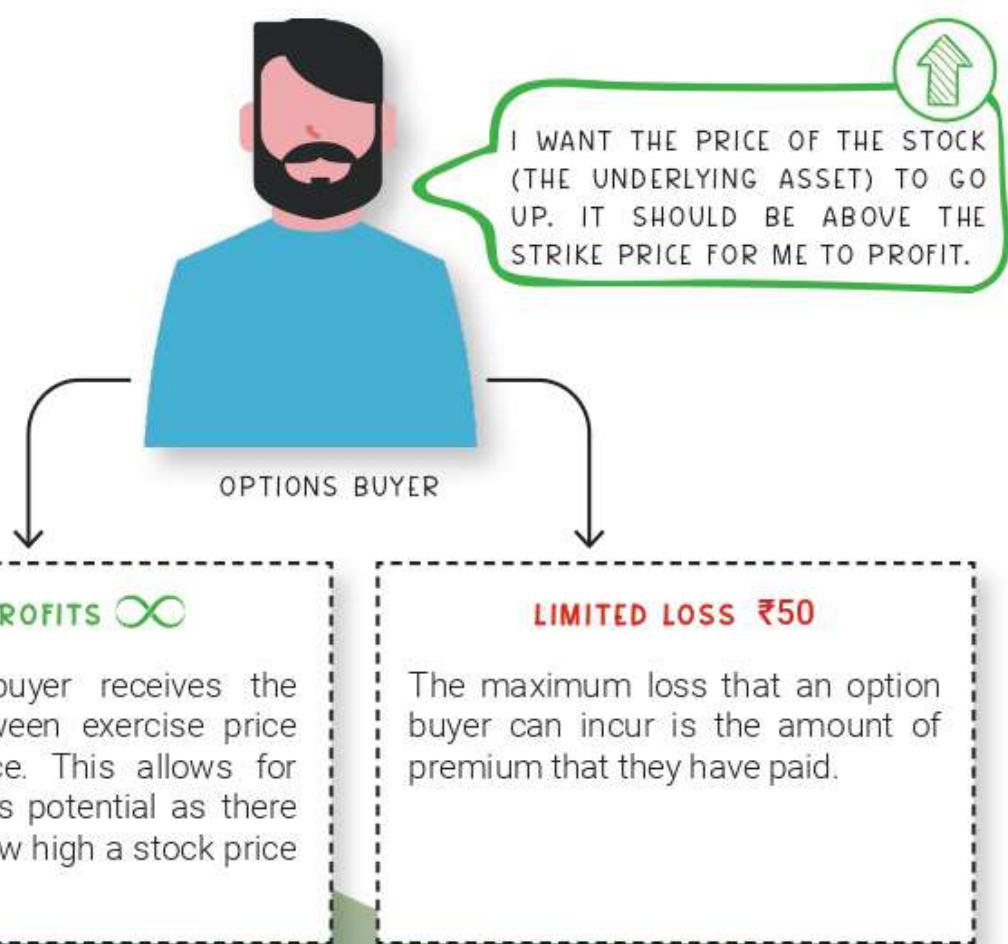
**₹2500**



SCENARIO 1  
When the Closing  
Price on Expiry is  
₹2100

## BUYER'S PERSPECTIVE

We can see that the strike price is ₹2200 and the market price is ₹2100. In this case, the options buyer can buy the asset for cheaper in the market as compared to the option contract. In this case, where Market Price < Strike Price, the buyer will not exercise the call option and let it expire. In this case, Loss for Options Buyer = ₹50 (Premium amount that they had paid)



## SELLER'S PERSPECTIVE

We saw that since the Market Price is less than the Strike Price and the options buyer will not exercise their rights and as a result, the Options seller will not have to pay anything to the buyer. The premium that they had received will be their profits. This happens till the time  $\text{Market Price} < \text{Strike Price}$ .



### MAXIMUM PROFITS ₹50

The maximum profit of the call seller will be equal to the premium amount.

### MAXIMUM LOSS $\infty$

The maximum loss that a call seller can incur is unlimited as the asset price can rise to any amount and the difference between stock price and strike price needs to be paid by the options seller.

UNLIMITED LOSS

LIMITED PROFITS

**SCENARIO 2**  
**When the Closing  
Price on Expiry is**  
**₹2500**



## BUYER'S PERSPECTIVE

The profit for the buyer would be calculated from the strike, therefore,

### Profit of the buyer

Current Market Price	₹2500
- Strike Price	(₹2200)
Profit before premium	<u>₹300</u>
- Premium	(₹50)
Profit of the buyer	₹250

Here, we can see that the Exercise price is higher than the Strike Price. So, the buyer will exercise their rights and receive a payoff of ₹300. However, the buyer had also paid a premium that needs to be deducted to calculate the overall profits as we saw earlier. So, the profit per unit for the buyer is ₹250. Profit per unit needs to be multiplied to the lot size to calculate the profits/losses on each lot.



## SELLER'S PERSPECTIVE

$$\text{Profit of the Buyer} \quad = \quad \text{Loss of the Seller}$$
$$₹250 \quad \quad \quad ₹250$$

The seller is on the opposite end of the trade. So, in this case they will have to make the payoff of ₹300 to the buyer. However, they had also received ₹50 as premium. As a result, total losses for the seller = ₹300 - ₹50 = ₹250. The profit of the Option buyer is compensated by the options seller.

**SCENARIO 3**

**When the Closing  
Price on Expiry is  
₹3000**

**BUYER'S PERSPECTIVE**

The payoff will be calculated in exact same manner as earlier. Payoff will be Exercise Price - Strike Price. Again, we will have to deduct the Premium payment by the buyer. So, the overall profit = ₹800 - ₹50 = ₹750

**Profit of the buyer**

Current Market Price	₹3000
- Strike Price	(₹2200)
Profit before premium	₹800
- Premium	(₹50)
Profit of the buyer	₹750

**SELLER'S PERSPECTIVE**

Profit of the Buyer = Loss of the Seller  
₹750 = ₹750



OPTIONS BUYER

THE SELLER WILL PAY ₹800 TO THE  
BUYER.



OPTIONS SELLER

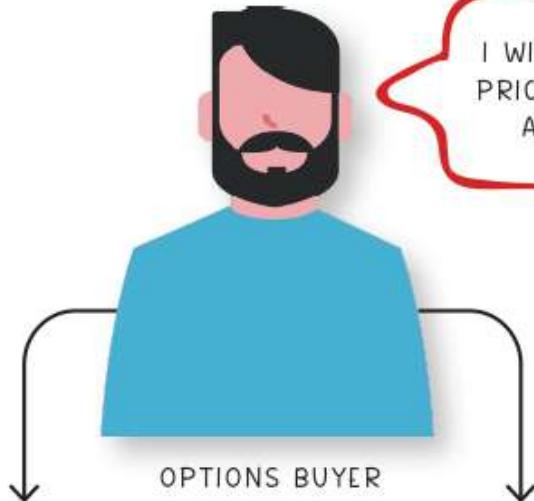
The seller is on the exact opposite side of the buyer. So, the seller will be liable for the payoff amount of ₹800. However, they had received ₹50 as premium. So, the total losses for the Options seller is ₹750 per unit.

This example goes on to show that the option buyer has unlimited profit potential. At the same time, the seller has unlimited loss potential. We can see that the price of the asset can increase to any amount.

## CALL OPTIONS

## PUT OPTIONS

### BUYER'S PERSPECTIVE



OPTIONS BUYER

#### MAXIMUM PROFITS $\infty$

The buyer of a put option benefits when the price of an asset goes down. Since the price can go down to even zero, the buyer of put option has unlimited profit potential.

#### MAXIMUM LOSS ₹50

The maximum loss of the put buyer will be equal to the premium amount.

UNLIMITED PROFITS

LIMITED LOSS

## SELLER'S PERSPECTIVE



**MAXIMUM PROFITS ₹50**

The maximum profit of the call seller will be equal to the premium amount.

**MAXIMUM LOSS ∞**

The seller of the put option can incur losses to any extent as the price can go down to even zero.

LIMITED PROFITS

UNLIMITED LOSS

Let's understand Put Options with an example.

**Let's say**, a Put Option buyer buys Put options at ₹2200 as strike price and pays ₹50 as premium. So, they buy 2200PE at premium of ₹50 per unit. Lets take 2 scenarios.



## BUYER'S PERSPECTIVE

We can see that the Exercise Price < Strike price for the put option. In this case, the buyer will receive a payoff of ₹100.

Here, the buyer had also paid a premium of ₹50. So, overall profits for them:

### Profit of the buyer

Strike Price	₹2200
- Price at expiry	(₹2100)
Profit before premium	₹100
- Premium	(₹50)
Profit of the buyer	₹50



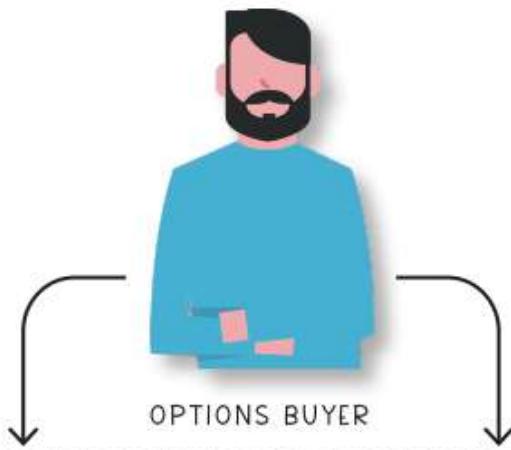
## SELLER'S PERSPECTIVE

$$\text{Profit of the Buyer } ₹50 = \text{Loss of the Seller } ₹50$$

The seller is on the exact opposite end of the contract. So, in this case, the Options seller will make a payoff of ₹100 to the buyer. However, they also received ₹50 as premium. Total loss of the seller = ₹100 - ₹50 = ₹50. This is how profits and losses will be calculated for the buyer and seller when the Exercise price < Strike Price.

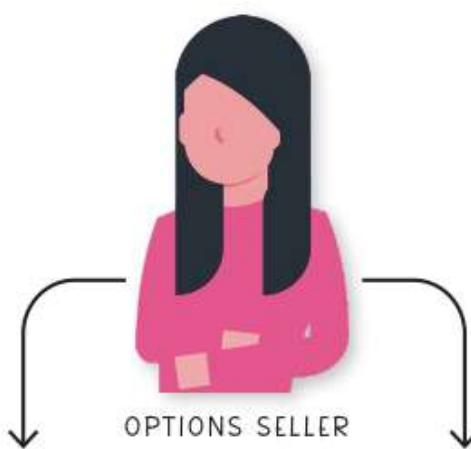
**SCENARIO 2**

**When the Closing Price on Expiry is ₹2500**

**BUYER'S PERSPECTIVE**

Here, we can see that the price on expiry is ₹2500 which is greater than the strike price. In this case, the put option will not be exercised as the Option buyer can sell the asset at a higher price in the market as against what the put option is allowing them to do. Since the put option will not be exercised, there will be no payoff involved. So, the buyer will not receive any payoff and the loss is the premium paid by them.

**TOTAL LOSS OF THE BUYER = ₹50**

**SELLER'S PERSPECTIVE**

Since there is no payoff involved, there will be no cash outflow.

**TOTAL PROFITS FOR THE OPTION SELLER = ₹50**

This is how Different types of put options behave at different price levels at expiry.

Essentially, based on the analysis and opinion on price movement, one may choose what position they want to take.

If the person expects the price to go up,  
the two options positions available are:



BUY

Buy call  
option

SELL

Sell Put  
option

If the person expects the price to go down,  
the two options positions available are:



BUY

Buy Put  
option

SELL

Sell Call  
option

We can even use a combination of different types of options and different strike prices to create option strategies. We can buy and sell options at the same time to benefit from the same. We will learn about such option strategies and how to create your own strategy, going ahead. With this, we have understood how put options and call options work and what it means to sell each type of option and buy each type of options. Lets build on this understanding of options going further.

# 5.5 MONEYNESS OF OPTIONS CONTRACT



Explainer Video



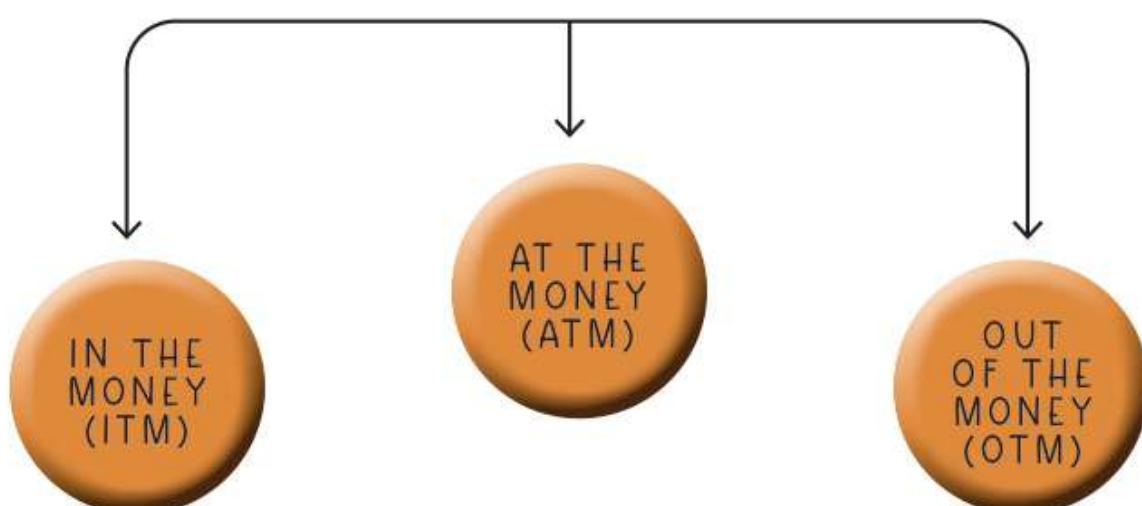
For any given asset, there is a list of strike prices at which put and call options are available. This list is called an Option Chain. You can look at an option chain on next page.

“ ”

EACH OPTION HAS A DIFFERENT STRIKE PRICE WHICH DETERMINES SOMETHING CALLED MONEYNESS OF THE OPTION.

This is based on how far is the strike price of the option from the current market price.

## MONEYNESS OF OPTIONS





Search by company name, symbol or keyword:  Q

**Nifty50**

17,327.35  
-302.45 (-1.72%)

Normal Market has Closed

Last Trading Date : 26-Sep-2022

HOME

ABOUT

INVEST

TRADE

MARKET DATA

CALLS

OI	CHNG IN OI	VOLUME	IV	LTP	CHNG	BID PRICE	ASK PRICE	STRIKE PRICE	BID QTY	BID PRICE	ASK PRICE	CHNG	LTP	IV	VOLUME	CHNG IN OI	OI	PUTS			
																		PUTS			
18	-	4	-	1,187.10	-262.90	150	1,163.90	1,220.05	150	1,150.00	200	3.20	4.20	500	0.45	3.20	26.25	11,045	598	942	
1,443	-10	79	-	1,149.00	-202.85	150	1,118.85	1,144.85	400	16,200.00	50	3.25	3.60	450	0.70	3.50	25.95	1,463.95	18,771	38,922	
149	-	-	-	-	-	150	1,056.10	1,114.80	150	16,250.00	50	4.05	4.20	50	1.05	4.05	25.25	17,448	4,521	2,059	
613	-26	64	-	1,044.00	-340.50	4,100	1,044.35	1,045.65	250	16,300.00	1,200	4.55	4.65	800	1.70	4.05	24.77	1,43,236	9,340	26,776	
59	-	22	21.15	1,072.25	-448.75	300	984.10	998.95	50	19,250.00	50	4.90	5.65	950	2.00	5.65	24.22	27,059	2,754	4,898	
948	-59	267	-	940.00	-310.00	150	944.85	949.85	100	16,400.00	1,250	6.10	6.00	1,100	1.45	5.50	23.82	2,27,056	12,670	27,591	
29	12	15	-	894.15	-517.95	50	886.00	902.20	200	16,450.00	50	6.50	7.60	600	2.95	7.00	23.49	55,706	3,485	6,151	
5,563	-401	1,738	-	844.90	-236.15	150	841.35	850.00	200	16,500.00	200	9.10	9.90	500	3.45	9.20	23.20	4,97,776	1,942	89,458	
39	13	37	-	806.85	-285.95	200	793.05	821.05	150	16,550.00	500	10.10	11.65	1,180	6.30	11.45	23.05	93,059	7,475	11,196	
564	-28	235	-	754.90	-295.10	150	742.90	756.80	300	16,600.00	1,950	12.00	13.60	1,50	7.80	13.60	22.70	3,57,571	17,377	47,319	
55	9	63	-	697.00	-280.25	450	674.70	723.65	350	16,650.00	100	15.65	15.60	100	8.60	15.05	22.31	1,23,248	10,273	14,544	
1,151	239	3,442	-	556.80	-236.70	250	653.15	661.05	150	16,700.00	400	18.80	19.00	150	11.55	19.00	22.18	4,27,934	20,072	54,342	
150	-112	219	17.27	616.70	-282.20	450	582.70	626.25	450	16,750.00	100	21.50	22.20	900	14.75	22.20	21.97	1,56,771	-1,210	10,226	
1,991	349	2,194	-	592.90	-565.50	-284.85	50	565.05	571.55	400	16,800.00	50	28.00	28.50	50	19.20	29.35	21.82	6,69,531	40,835	75,879
139	94	249	17.77	527.80	-290.20	150	517.90	542.15	150	16,850.00	50	32.00	33.65	50	22.80	34.45	21.60	1,46,752	2,782	9,221	
1,014	291	2,435	17.12	478.10	-282.65	450	473.05	480.00	50	16,900.00	100	39.00	42.00	100	27.55	42.00	21.53	5,42,442	11,558	44,617	
530	212	587	18.07	429.75	-295.20	450	424.75	449.60	450	16,950.00	50	49.00	50.95	100	32.00	50.05	21.26	1,75,194	3,141	10,405	
16,867	4,814	47,644	18.02	397.00	-275.05	150	395.15	399.00	300	17,000.00	200	59.30	59.70	50	37.20	58.00	21.29	13,57,725	21,335	1,12,666	
839	151	1,030	18.25	357.55	-267.55	200	347.35	373.70	450	17,050.00	150	62.25	71.60	1,400	47.20	71.60	21.24	2,34,394	2,405	10,588	
4,122	1,907	2,984	18.20	324.00	-237.95	250	318.00	322.25	50	17,100.00	150	80.10	84.00	1,300	54.55	84.00	21.14	7,48,712	19,234	49,116	
1,414	416	5,427	18.53	285.95	-237.10	450	274.90	291.50	150	17,150.00	100	95.10	100.00	700	60.20	95.15	21.07	3,41,197	2,708	11,572	
6,929	2,596	8,011	18.47	253.10	-240.05	600	254.10	255.00	1,150	17,200.00	700	112.45	116.00	100	72.10	116.00	23.92	1,22,062	20,289	74,700	
2,784	2,401	36,795	18.27	224.00	-221.85	400	221.25	224.00	250	17,250.00	100	134.00	145.00	250	84.60	135.00	23.86	4,43,267	2,767	10,992	
32,118	21,116	3,671	18.50	195.00	-215.95	450	195.00	196.00	2,750	17,300.00	250	156.00	157.00	2,350	97.00	157.00	20.82	14,76,164	27,522	78,326	
19,278	19,810	2,554	18.54	168.55	-224.60	100	168.00	168.55	250	17,350.00	50	179.70	191.50	150	111.95	181.95	20.83	6,40,333	14,265	20,566	

## IN THE MONEY (ITM)

In the money options are those options which already have some payoff built in it. That means if it is a call option, then option contracts with strike prices lower than the current market price are called In The Money. They have some payoff in-built at the time of purchase as well. At the same time, for put options, contracts with strike price higher than Market Price are called In-the-money.

### For call options:

Strike price < Current Market Price (CMP)



Even at the time of purchase, these call options have some pay off in-built as Market Price > Strike Price.

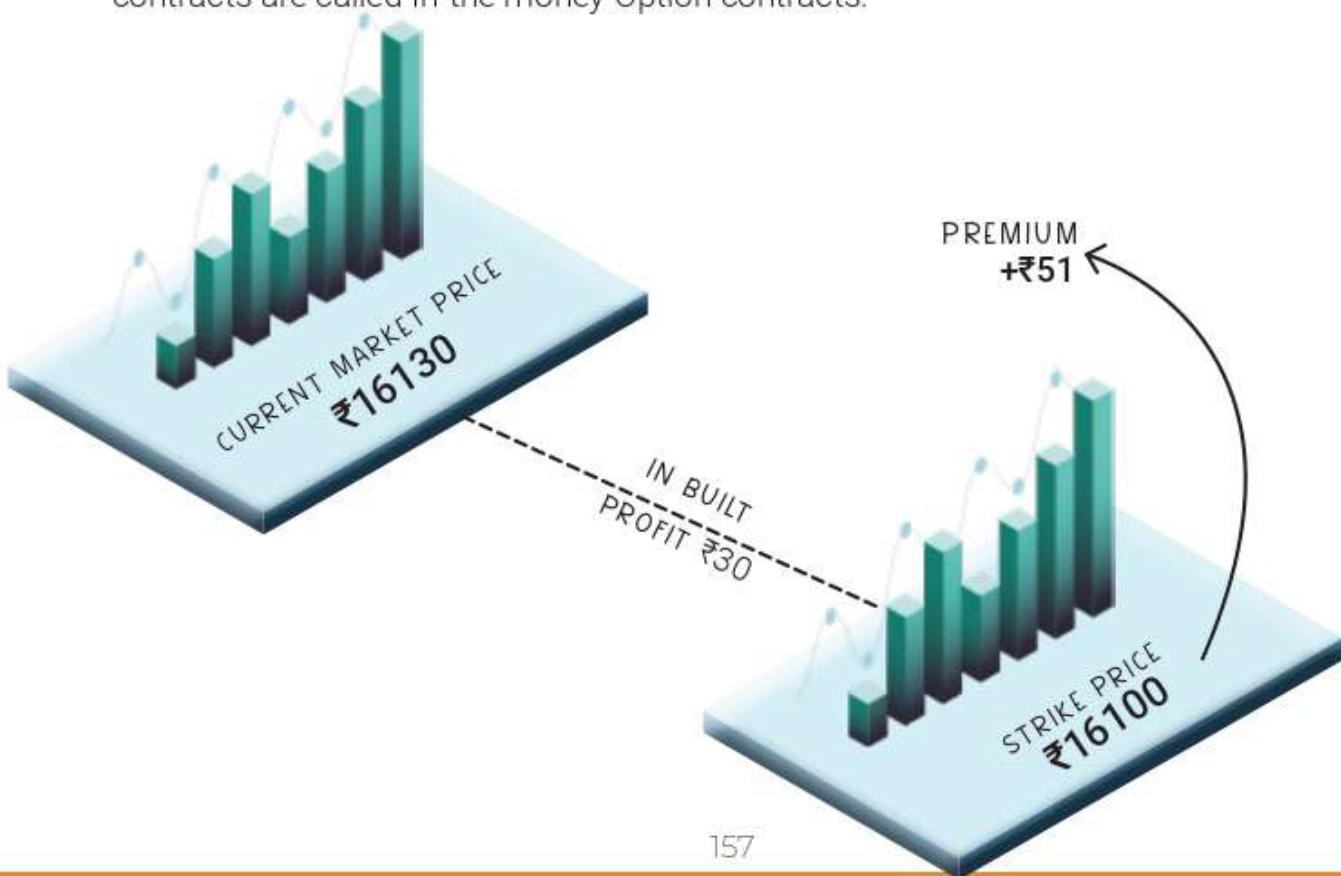
### For put options:

Strike price > Current Market Price (CMP)



Even at the time of purchase, these put options have some pay off in-built as Market Price < Strike Price.

**For instance**, assuming it is a call option. Let's say the spot price of a stock is ₹16,130 and you buy a call option with a strike price of ₹16,100 at a premium of ₹51. This premium of ₹51 already has ₹30 as in-built pay off at the moment. Such option contracts are called In-the money Option contracts.

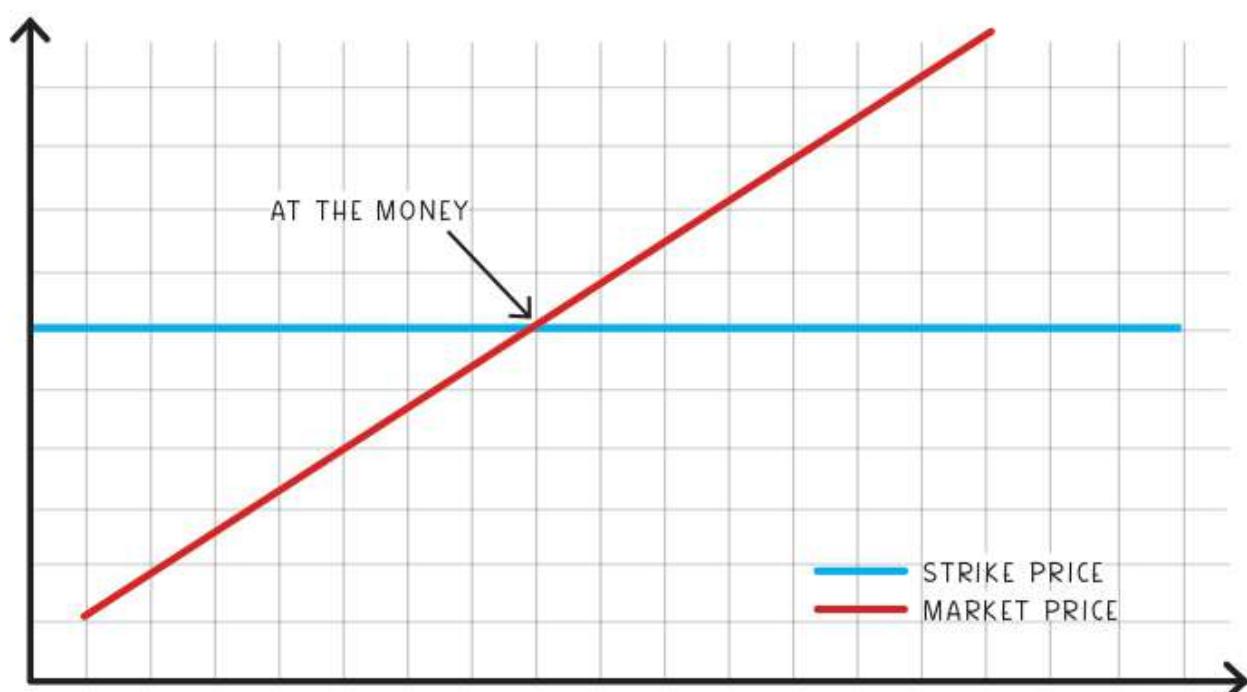


Also, if the difference between the strike price and the current price is extremely high, lets say ₹14,000 is the strike price in above example, it is called Deep In the Money.



### AT THE MONEY (ATM)

At the money (ATM) options are those with a strike price very close to the current market price. At the money option contracts are very sensitive to changes in market price of the underlying asset.



**For instance**, at spot ₹16,130 an option with a strike price close to this (say ₹16,150) will be called at the money.



### OUT OF THE MONEY (OTM)

Out of Money Option contracts are those that do not have any payoff built in them. For call options, if the Strike price is greater than Market price, the contract is said to be out of money. For put options, if the strike price is lower than market price, the contract is said to be out of money.



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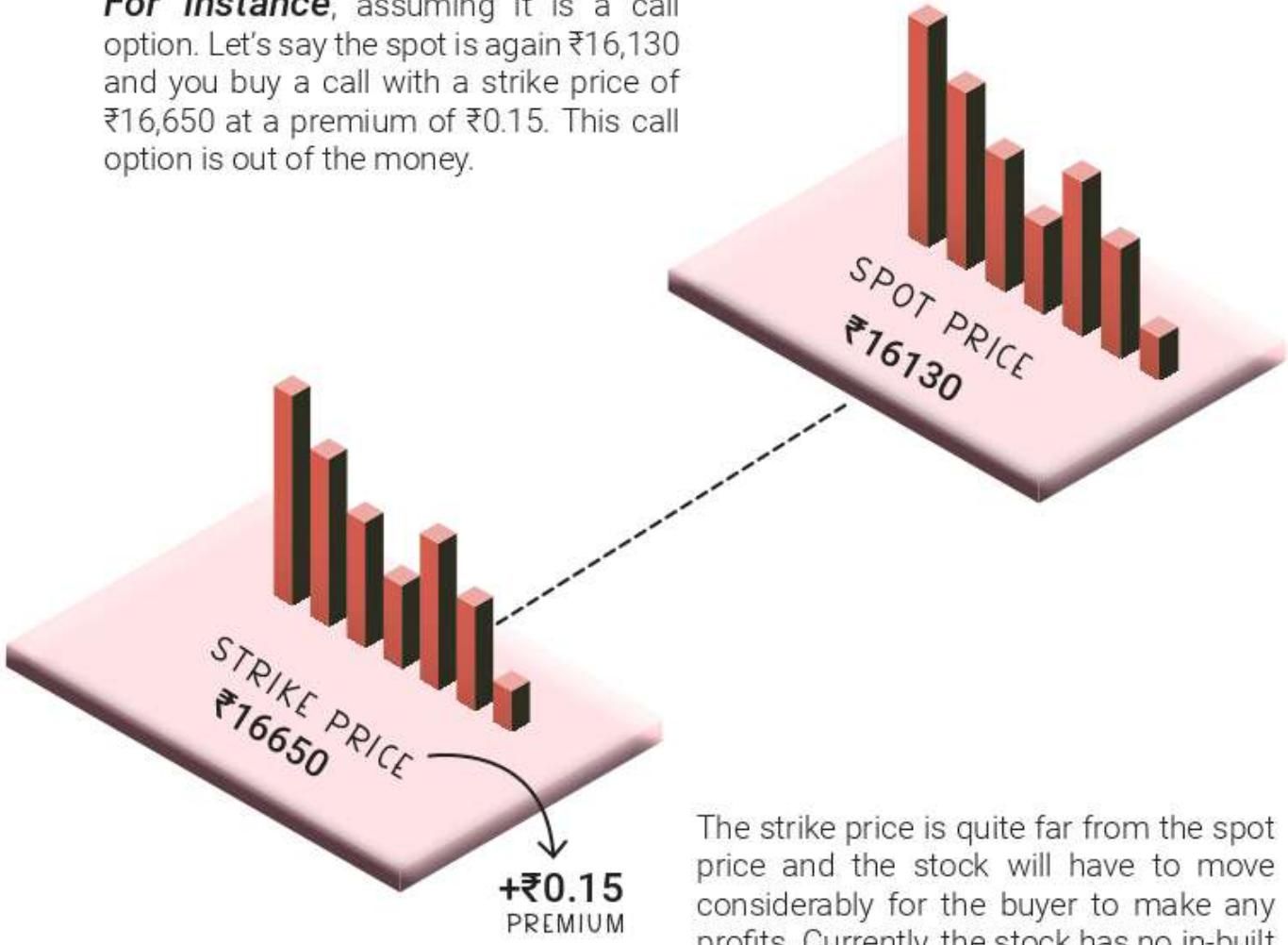
ABOUT

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## CALLS

	OI	CHNG IN OI	VOLUME	IV	LTP	BID QTY	CHNG	BID PRICE	ASK PRICE	STRIKE PRICE	QTY	BID PRICE	ASK PRICE	ASK QTY	CHNG IN OI	PUTS
18	-	4	-	1,187.10	-262.90	150	1,163.90	1,220.05	150	16,150.00	200	3,20	4,20	500	0.45	3,20
1,443	-10	79	-	1,149.00	-303.95	150	1,118.85	1,144.95	400	16,200.00	50	3,25	3,60	350	0.70	3,50
149	-	-	-	-	-	150	1,056.10	1,114.80	150	16,250.00	50	4,05	4,20	50	1.05	4,05
618	-25	84	-	1,045.00	-350.00	4,100	1,036.25	1,045.65	250	16,300.00	1,200	4,55	4,65	800	1.70	4,95
59	-	22	3115	1,027.25	-349.75	3,00	982.10	998.85	50	16,350.00	50	4,90	5,65	950	2.00	5,65
938	-58	267	-	940.00	-310.00	150	924.45	949.85	100	16,400.00	1,250	5,10	6,00	1,100	1.65	5,30
29	12	15	-	894.15	-517.95	50	886.00	903.20	200	16,450.00	50	6,50	7,60	600	2.95	7,00
5,563	-601	1,726	-	844.90	-294.15	150	841.35	850.00	200	16,500.00	200	9,10	9,80	500	3.45	8,20
49	13	27	-	806.85	-285.95	2,00	794.05	821.05	150	16,550.00	500	10,10	11,65	1,800	6,30	11,45
564	-28	253	-	754.90	-285.10	150	742.90	756.90	300	16,600.00	1,950	12,00	13,60	1,50	7,80	13,60
55	9	63	-	697.00	-280.25	450	674.70	723.45	350	16,650.00	100	15,05	15,60	100	9,60	15,05
1,151	239	3,442	-	656.80	-286.70	250	653.15	661.05	150	16,700.00	400	18,80	19,00	150	11,55	19,00
160	-112	219	1727	616.70	-282.30	450	598.70	626.25	450	16,750.00	100	21,50	23,20	900	14,75	23,20
1,891	348	2,194	15,92	565.50	-284.55	50	563.05	571.55	300	16,800.00	50	28,00	28,50	50	19,20	29,35
139	94	269	17,77	527.80	-230.20	150	517.90	542.15	150	16,850.00	50	33,00	33,65	50	22,60	34,45
1,013	291	2,635	1712	478.10	-282.65	450	472.05	480.00	50	16,900.00	100	39,00	42,00	100	27,55	42,00
530	212	597	18,07	429.75	-285.20	450	424.75	449.60	450	16,950.00	50	48,00	50,95	100	33,00	50,05
16,867	4,814	47,644	18,02	397.00	-275.05	150	395.15	399.00	300	17,000.00	200	59,30	59,70	50	37,20	58,00
839	151	1,030	18,25	357.55	-267.55	200	347.35	373.70	450	17,050.00	150	62,05	71,60	1,420	47,20	71,60
4,122	1,967	29,888	18,30	284.00	-287.95	250	281.00	322.25	50	17,100.00	150	80,10	84,00	1,200	54,55	84,00
1,414	416	5,427	18,53	285.95	-287.10	450	274.90	291.50	150	17,150.00	100	95,10	100,00	700	60,30	95,15
6,939	2,594	80,110	18,47	253.10	-240.05	600	253.10	255.00	1,150	17,200.00	700	112,45	116,00	100	72,10	116,00
2,784	2,401	36,756	18,27	224.00	-221.35	400	221.25	224.00	250	17,250.00	100	134,00	135,00	250	84,60	135,00
32,138	21,116	3,67919	18,50	195.95	-215.95	450	192.00	196.00	2,750	17,300.00	250	156,00	157,00	97,00	20,92	147,614
19,278	19,810	2,59,433	18,54	168.55	-202.60	100	168.00	168.55	250	17,350.00	50	179,70	181,50	150	111,85	181,55

**For instance**, assuming it is a call option. Let's say the spot is again ₹16,130 and you buy a call with a strike price of ₹16,650 at a premium of ₹0.15. This call option is out of the money.



The strike price is quite far from the spot price and the stock will have to move considerably for the buyer to make any profits. Currently, the stock has no in-built payoff.

With this, we have understood the moneyness of Options. We can now understand if options are in the money, at the money or out of money. In the money options have the highest premium followed by At the money options. This will come in handy when we will learn about option strategies.

## 5.6 OPTION PAYOFFS

Option payoff chart shows the profits and losses at different levels of prices of the underlying asset. Here, we calculate the profit or loss at each price of the underlying asset on expiry. This explains us the circumstances in which the option makes money and circumstances when it loses money.



Going ahead we will learn how to create a payoff chart for different option strategies. Payoff charts help us understand the risk-reward under different circumstances and help in decision making.

In the next chapter and the chapter on option strategies, we will learn about Option payoff charts in great detail.

# Notes

# Notes

# **CHAPTER 6**

# **BASICS OF OPTIONS PAYOFF CHARTS**

- 6.1 Introduction**
- 6.2 Understanding payoff charts for call options**
- 6.3 Understanding payoff charts for put options**

## 6.1 INTRODUCTION

“

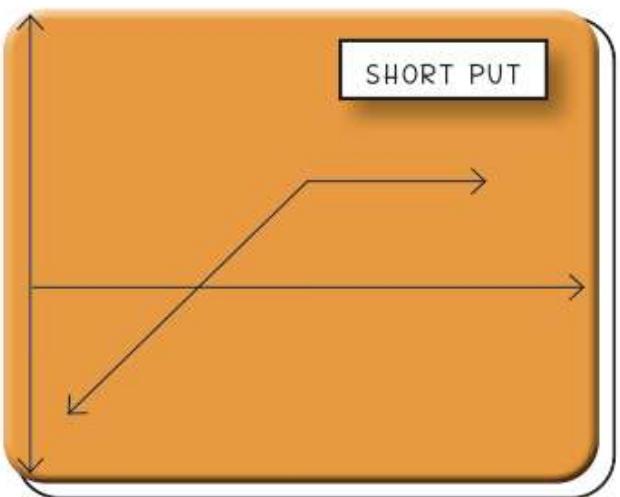
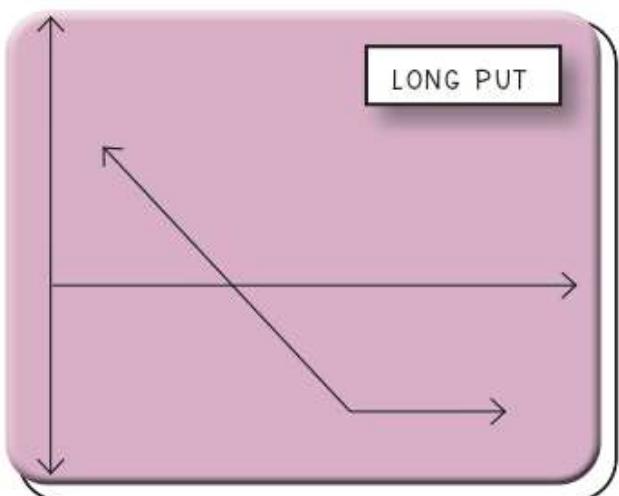
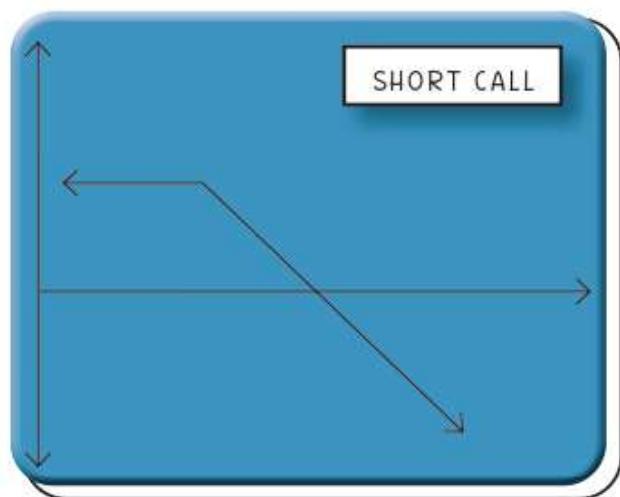
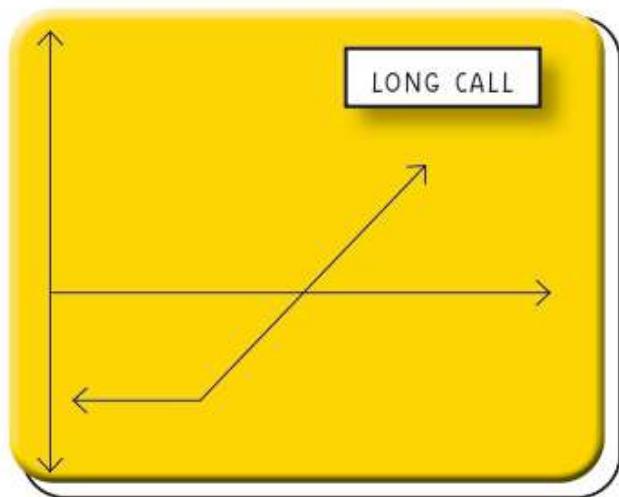
OPTION PAYOFFS MEANS THE PROFITABILITY OF AN OPTION UNDER DIFFERENT PRICE CONDITIONS.

”

It helps us to understand the Risks/Rewards profile before taking a trade. The payoff charts are visually represented using graphs and are really important when it comes to more complex strategies.



Pay off charts are graphical representation of the profit/loss at different price levels on the date of expiry. The X axis is used to denote various prices possible on the date of expiry and Y axis denotes the profit or loss incurred in the transaction. Such pay-off graphs help us visualise and understand the circumstances under which we will profit and circumstances under which we will incur losses. This helps us calculate the risk-reward ratio too.

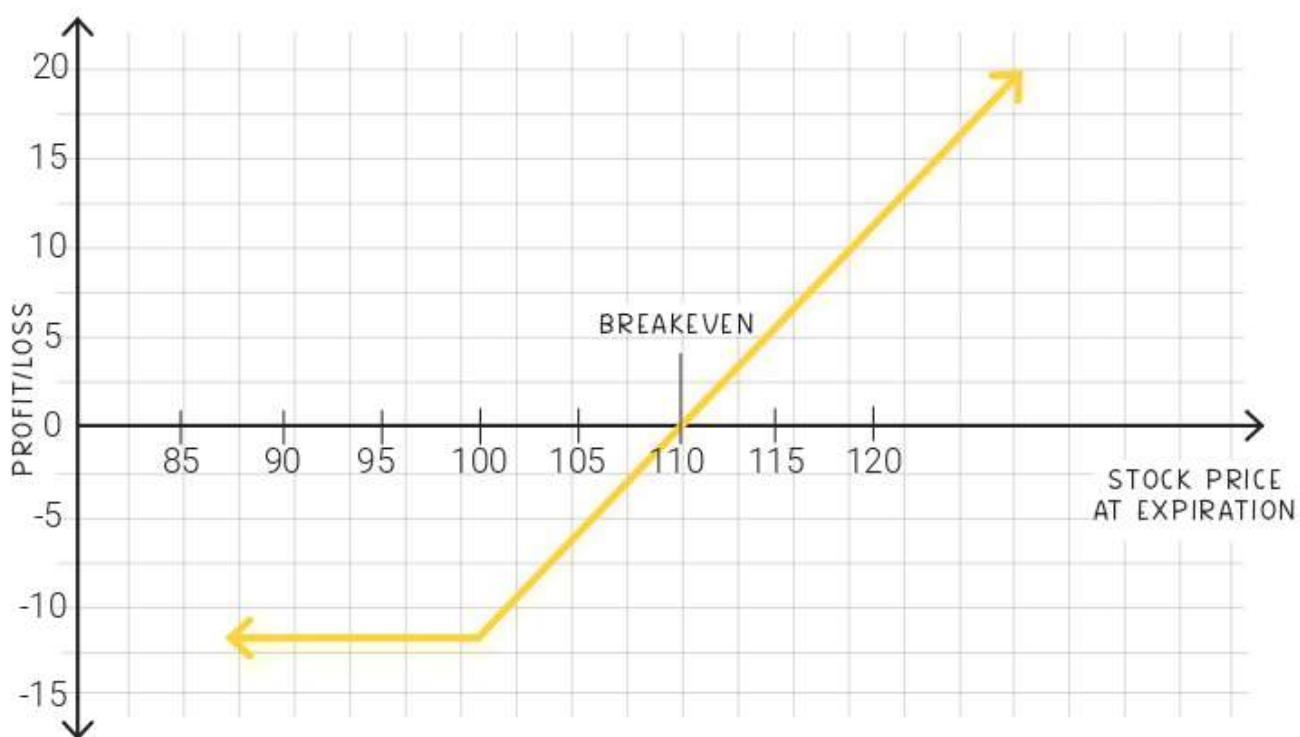
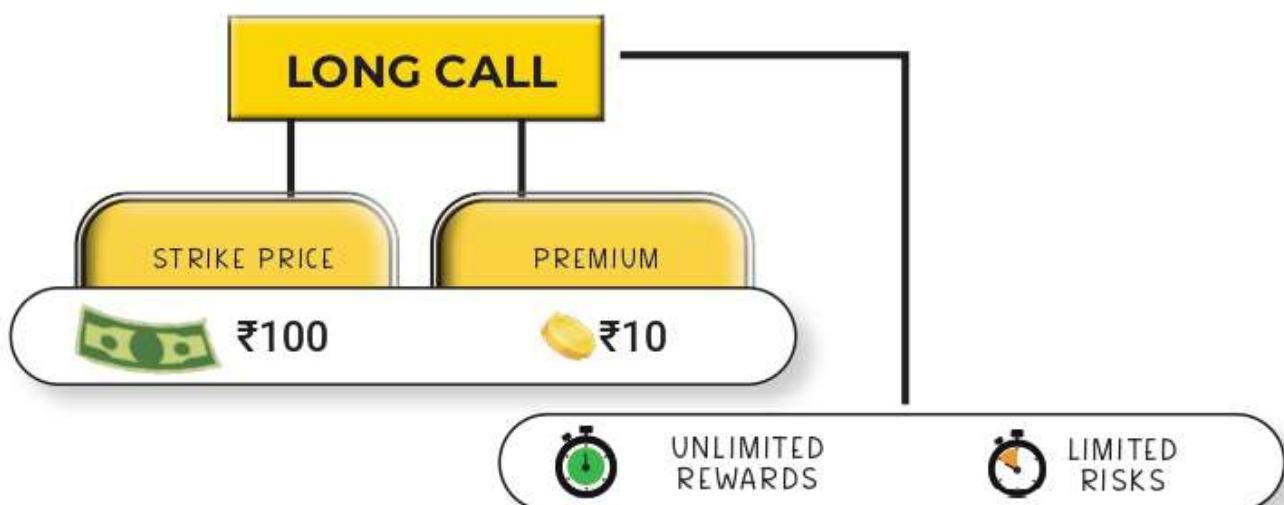


Let us begin with simple payoff charts for simple call and put option from a buyer as well as a seller point of view. We will go into more detail or complex pay-off charts further when we will create payoff charts for different option strategies.

## 6.2 UNDERSTANDING PAYOFF CHARTS FOR CALL OPTIONS

### PAY-OFF FOR CALL BUYER

Suppose that Mr. X buys a call option at a Strike price of ₹100 and pays a premium amount of ₹10 for the same.



In the graph above, we have Profit or Loss on the Y-axis and Price of the Stock at the expiration on the X-axis.

Now, this premium amount of ₹10 is Mr. X's outflow and also the maximum loss value. As the price would increase beyond the strike price of 100, the seller will have to start making a payment of the value Exercise Price - Strike Price. However, till the time entire premium is not covered, the option buyer will be in loss. We can see in the graph that there comes a break-even point and if the price of the option continues to increase after that, the buyer will enjoy the profits.

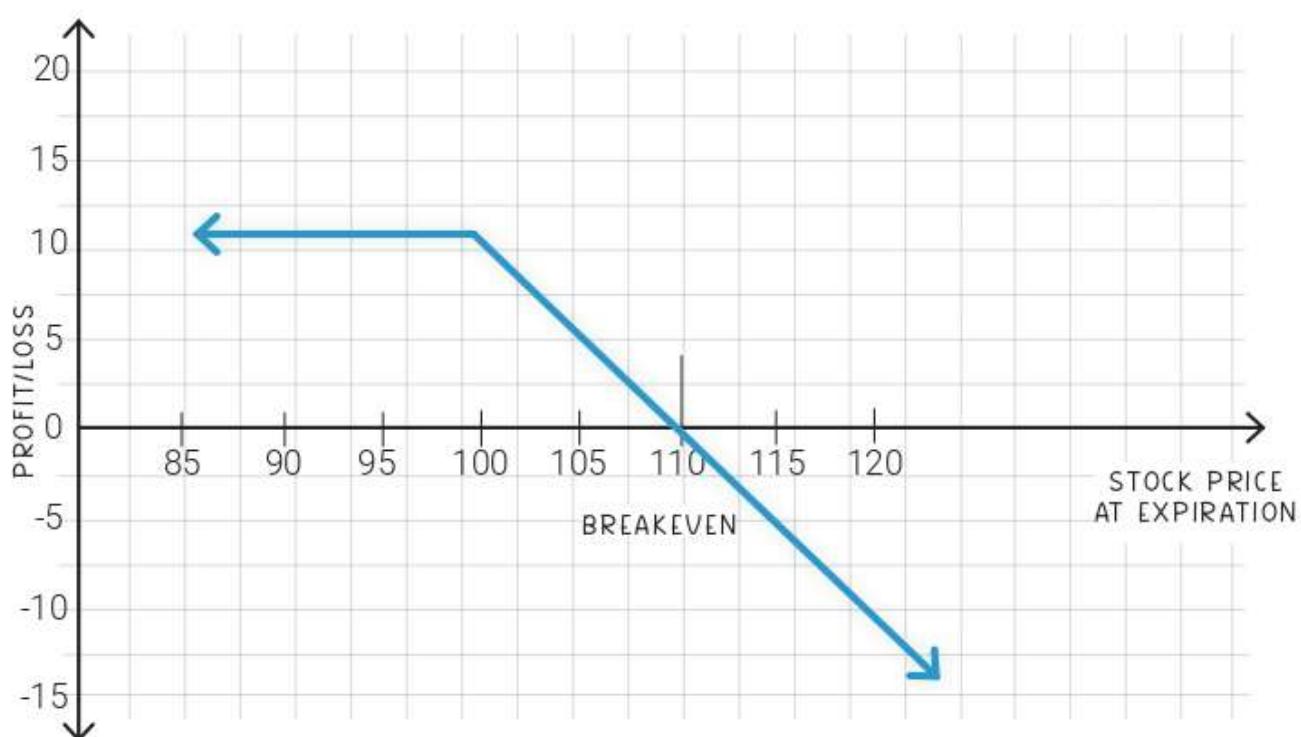
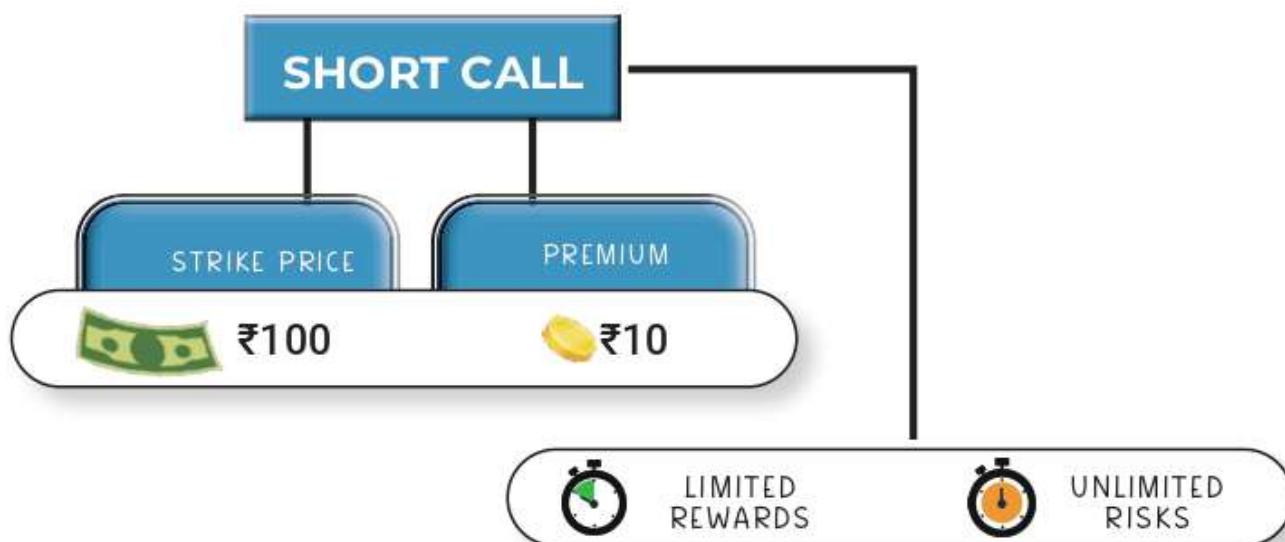
CURRENT MARKET PRICE (CMP)	CMP - STRIKE PRICE - PREMIUM = PROFIT/ LOSS	REMARKS
₹90	₹90 - ₹100 - ₹10 = (₹20) (₹10)	Loss of Premium because the buyer will not exercise the option.
₹100	₹100 - ₹100 - ₹10 = (₹10)	The buyer will still incur a loss of the value of premium as the option will not be exercised.
₹105	₹105 - ₹100 - ₹10 = (₹5)	Losses will decrease as price continues to rise above the strike price.
₹110	₹110 - ₹100 - ₹10 = ₹0	Buyer is standing at no profit no loss point i.e. Breakeven point.
₹120	₹120 - ₹100 - ₹10 = ₹10	Profit

THE BUYER CAN HAVE UNLIMITED PROFITS AS THE PRICE OF THE UNDERLYING ASSET CAN INCREASE TO ANY AMOUNT.

## PAY-OFF FOR CALL SELLER

For call options seller, the scenario is opposite or mirror image of the buyer's payoff chart as the seller has limited profits and unlimited losses.

Suppose that Mr. Y sells a call option at a Strike price of ₹100 in exchange of a premium amount of ₹10 for the same.



In the graph above, we have Profit or Loss on the Y-axis and Price of the Stock at the expiration on the X-axis.

**CURRENT MARKET PRICE (CMP)****STRIKE PRICE + PREMIUM - CMP = PROFIT/ LOSS****REMARKS**

₹90

$$\text{₹}100 + \text{₹}10 - \text{₹}90 = \text{₹}20 \quad \text{₹}10$$

Profit of Premium because the buyer will not exercise the option.

₹100

$$\text{₹}100 + \text{₹}10 - \text{₹}100 = \text{₹}10$$

The seller will profit as the option will not be exercised.

₹105

$$\text{₹}100 + \text{₹}10 - \text{₹}105 = \text{₹}5$$

The profits for the seller will start to reduce as the seller will have to payoff a certain amount to the buyer.

₹110

$$\text{₹}100 + \text{₹}10 - \text{₹}110 = \text{₹}0$$

At this point, neither buyer nor seller will make any profits or losses. This is the break-even point for all parties.

₹120

$$\text{₹}100 - \text{₹}10 - \text{₹}120 = (\text{₹}10)$$

Beyond this point, if the price continues to rise, the seller will start incurring losses. The seller can incur infinite losses

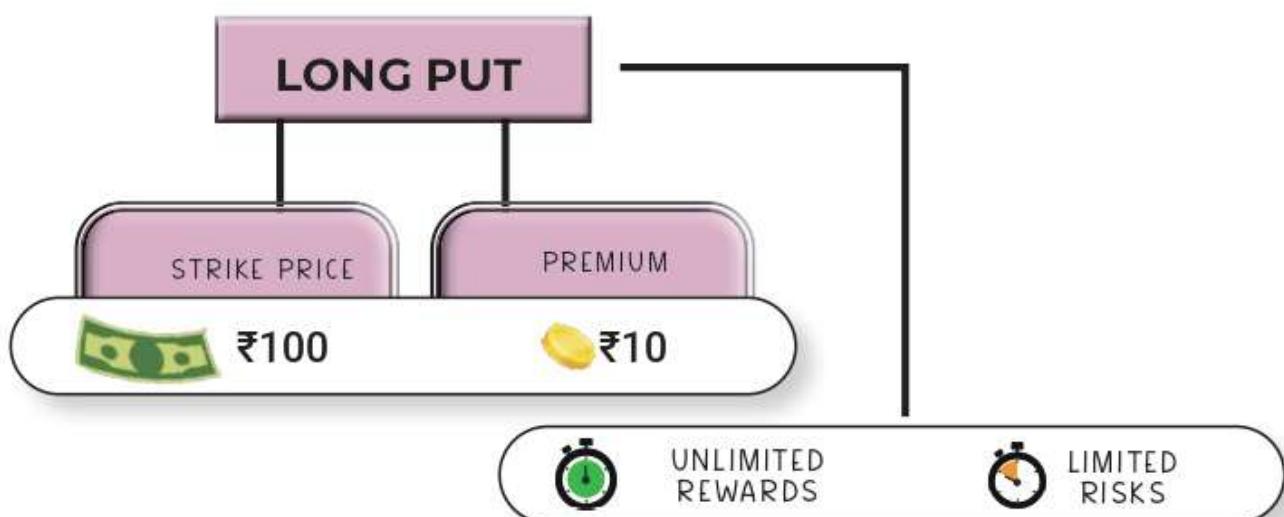
THE LOSSES OF THE SELLER ARE UNLIMITED BEYOND BREAKEVEN POINT I.E. ₹110 WITH RESPECT TO THE CHANGE IN MARKET PRICE.

This way we can calculate payoffs at different prices and understand the payoff charts for our options position.

# 6.3 UNDERSTANDING PAYOFF CHARTS FOR PUT OPTIONS

## PAY-OFF FOR PUT BUYER

Suppose that Mr. A buys a put option at a Strike price of ₹100 and pays a premium amount of ₹10 for the same.



In the graph above, we have Profit or Loss on the Y-axis and Price of the Stock at the expiration on the X-axis.

Now, this premium amount of ₹10 is Mr. A's outflow and also the maximum loss value. As the price decreases below the strike price of ₹100, the put buyer starts to recover their premium and reduce losses. After the price goes below the Break-even point, the put buyer becomes profitable.

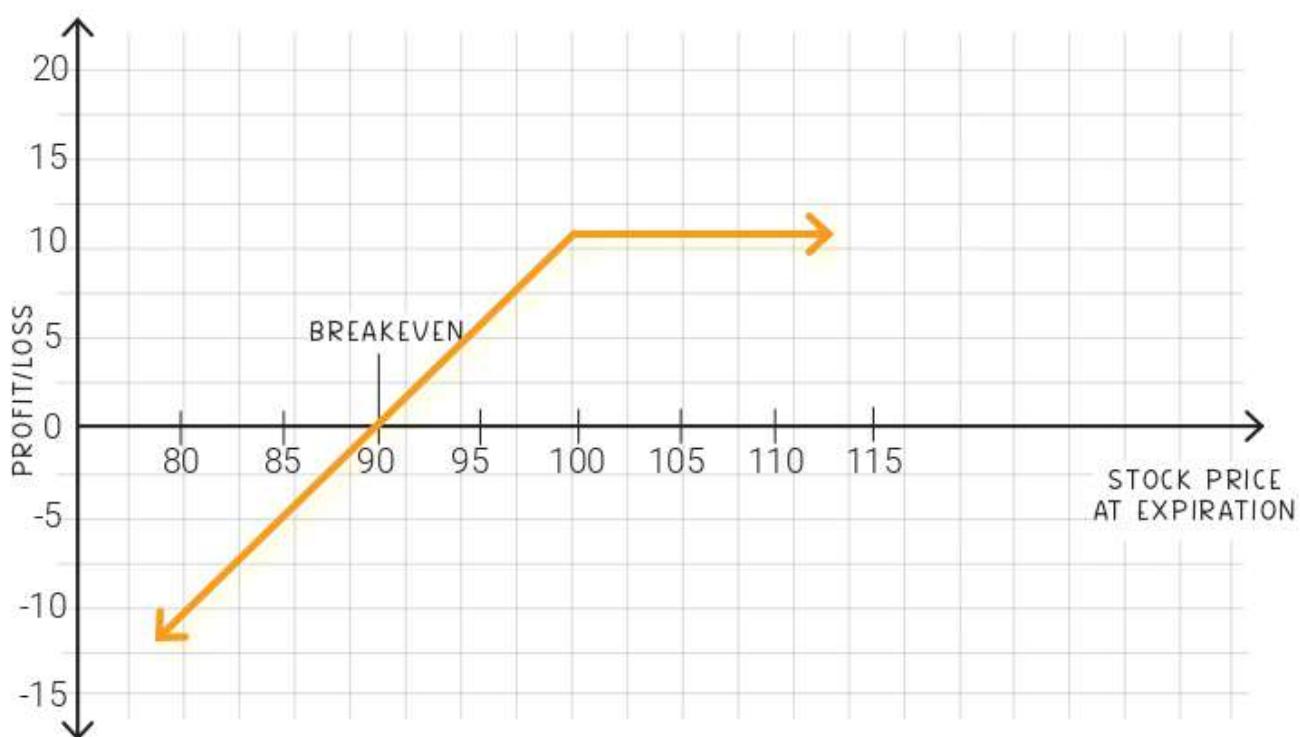
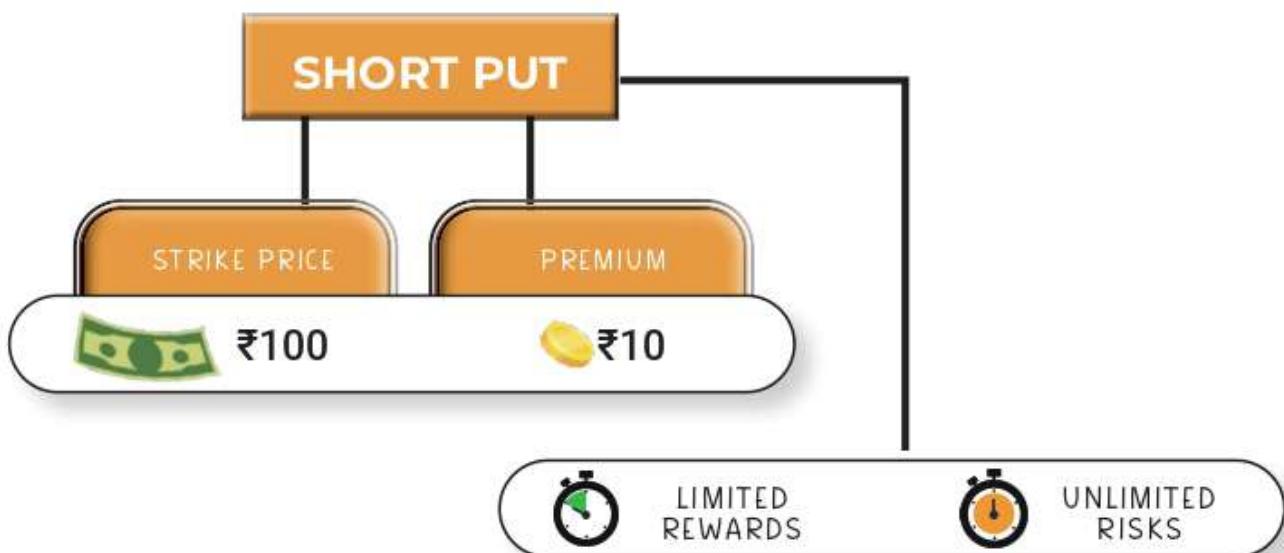
CURRENT MARKET PRICE (CMP)	STRIKE PRICE - CMP - PREMIUM = PROFIT/ LOSS	REMARKS
₹110	$\text{₹100} - \text{₹110} - \text{₹10} = \text{(₹20)} \text{ (₹10)}$	Loss of premium as the option will not be exercised.
₹100	$\text{₹100} - \text{₹100} - \text{₹10} = \text{(₹10)}$	Loss of premium as the option will not be exercised.
₹95	$\text{₹100} - \text{₹95} - \text{₹10} = \text{(₹5)}$	Losses will decrease as some part of the premium will be recovered as payoff.
₹90	$\text{₹100} - \text{₹90} - \text{₹10} = \text{₹0}$	This is the break-even point where neither the buyer nor the seller makes any profit or loss.
₹80	$\text{₹100} - \text{₹80} - \text{₹10} = \text{₹10}$	If the price continues to fall below the break-even price, the buyer of the option will make a profit and will make more money with every price decline.

THE PROFITS OF THE BUYER ARE UNLIMITED BEYOND BREAKEVEN POINT I.E. ₹90  
THE LOSSES ARE CAPPED TO THE PREMIUM PAID BY THE PUT OPTION BUYER.

## PAY-OFF FOR PUT SELLER

For put options seller, the scenario is opposite or mirror image of the buyer's payoff chart as the seller has limited profits and unlimited losses potential.

Suppose that Mr. B sells a put option at a Strike price of ₹100 in exchange of a premium amount of ₹10 for the same.



In the graph above, we have Profit or Loss on the Y-axis and Price of the Stock at the expiration on the X-axis.

CURRENT MARKET PRICE (CMP)	CMP - STRIKE PRICE + PREMIUM = PROFIT/ LOSS	REMARKS
₹110	₹110 - ₹100 + ₹10 = ₹20 <del>₹10</del>	The seller will make a profit as the option will not be exercised by the buyer.
₹100	₹100 - ₹100 + ₹10 = ₹10	The seller will make a profit as the option will not be exercised by the buyer.
₹95	₹95 - ₹100 + ₹10 = ₹5	The seller will still be profitable till the time the price is not below the break-even level. However, the profits will reduce.
₹90	₹90 - ₹100 + ₹10 = ₹0	The profit or loss is at zero at the break-even level.
₹80	₹80 - ₹100 + ₹10 = (₹10)	If the prices continue to fall beyond the break-even level too, the seller will incur losses.

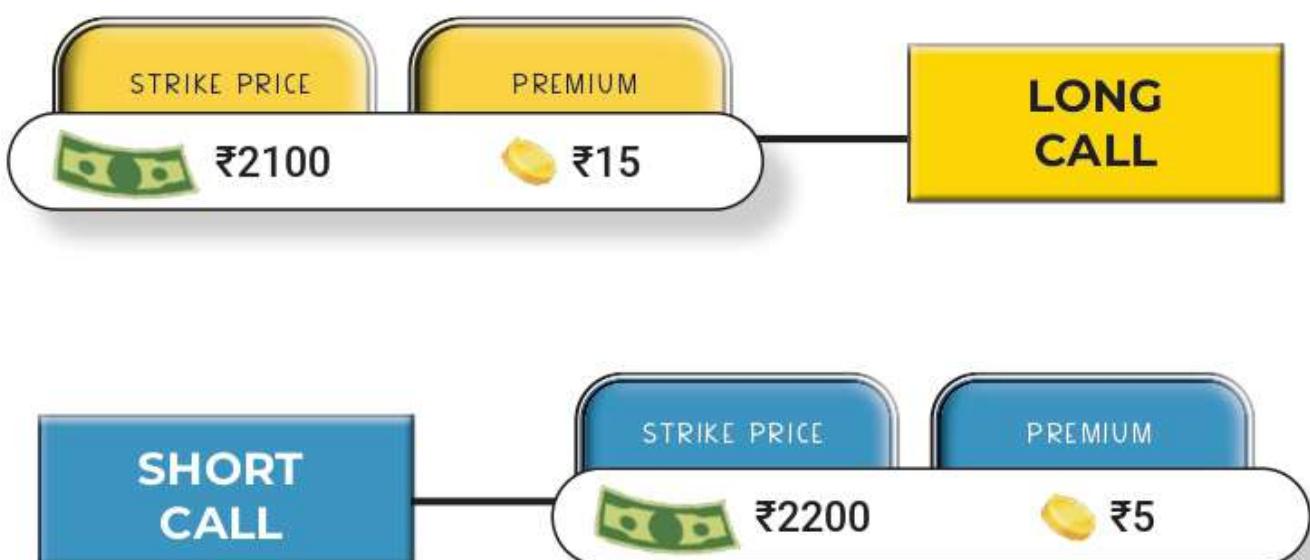
THE LOSSES OF THE PUT SELLER WILL BE UNLIMITED BEYOND BREAKEVEN POINT I.E. ₹90 LOWER THE PRICE FALLS, HIGHER WILL BE THE LOSS THAT THE PUT OPTION SELLER WILL INCUR.

Now we understand how Payoff charts are calculated, we can use the same to create payoff charts for more complicated options, combination of multiple options and so on. We will need this when we create payoff charts for entire strategies.

Let us try out together once to create a payoff chart taking a hypothetical example where we take positions in two options in a combination.



One we are buying i.e., a long call position at a Strike Price of ₹2100 for a premium of ₹15. And another one we are selling i.e., a short call position at a Strike Price of ₹2200 for a premium of ₹5. Let's understand what the profit or loss situation would look like in this strategy.





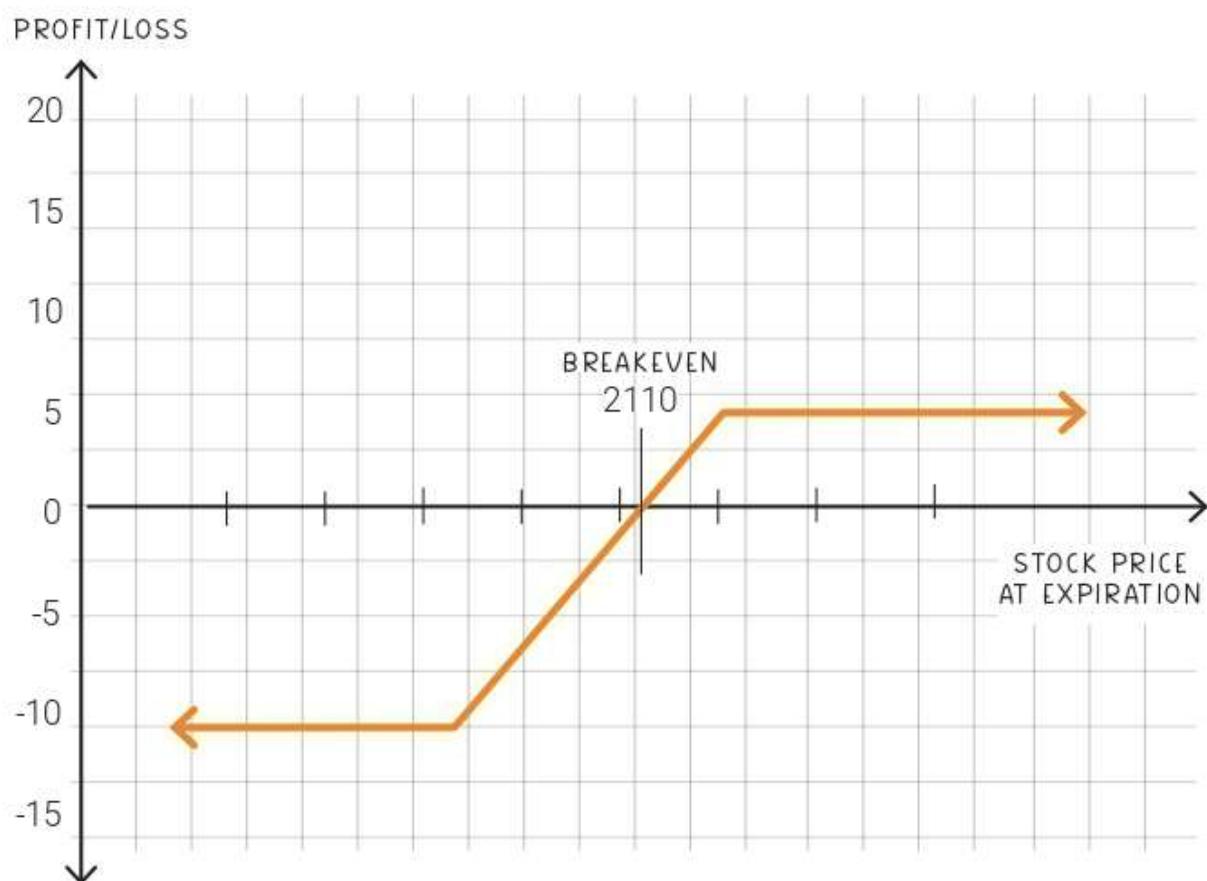
As the Current market price comes to ₹2110, our positions hit the break-even point. Beyond this point, as a call buyer, we make profits as the price goes up.

STRIKE PRICE	2100
- PREMIUM PAID	(15)
+ PREMIUM RECEIVED	5
BREAK EVEN POINT	2110

However, since we sold a call at ₹2200 strike price our profits are limited to this price movement. Once the market price goes above ₹2200, with additional rupees that we make in profit on the Long CE2100 position, we will also incur a loss of same amount on Short CE2200 position. As a result, we have capped our profits when the price is at ₹2200.

Therefore, the graphical representation of this payoff can be shown with the following payoff chart.

We can see that the maximum profit is capped at ₹2200.



We can see that if the price remains below ₹2100, then we will incur losses. The losses will be of amount - ₹10 which was initial premium that we had invested.

We will be covering these in-depth shortly as we move ahead with Option Strategies. Until then it is advisable to practice with some hypothetical combinations of options to get a hang of it.

# Notes

# **CHAPTER 7**

## **PUT CALL PARITY**

- 7.1 Introduction**
- 7.2 What does the put call parity relationship say?**
- 7.3 Assumptions of Put Call Parity**
- 7.4 Put Call Ratio (PCR)**

## 7.1 INTRODUCTION

“

PUT CALL PARITY DEFINES THE RELATIONSHIP BETWEEN A CALL OPTION PRICE, PUT OPTION PRICE AND THE SPOT PRICE OF ANY GIVEN ASSET.

”



While Put Call Parity may not be that often used in a real-life scenario or in our day-to-day life, understanding the same is really important to understand the relation between derivative contracts and the asset.

In case the Put Call Parity relationship does not hold true, there is a chance for arbitrage.

## ARBITRAGE



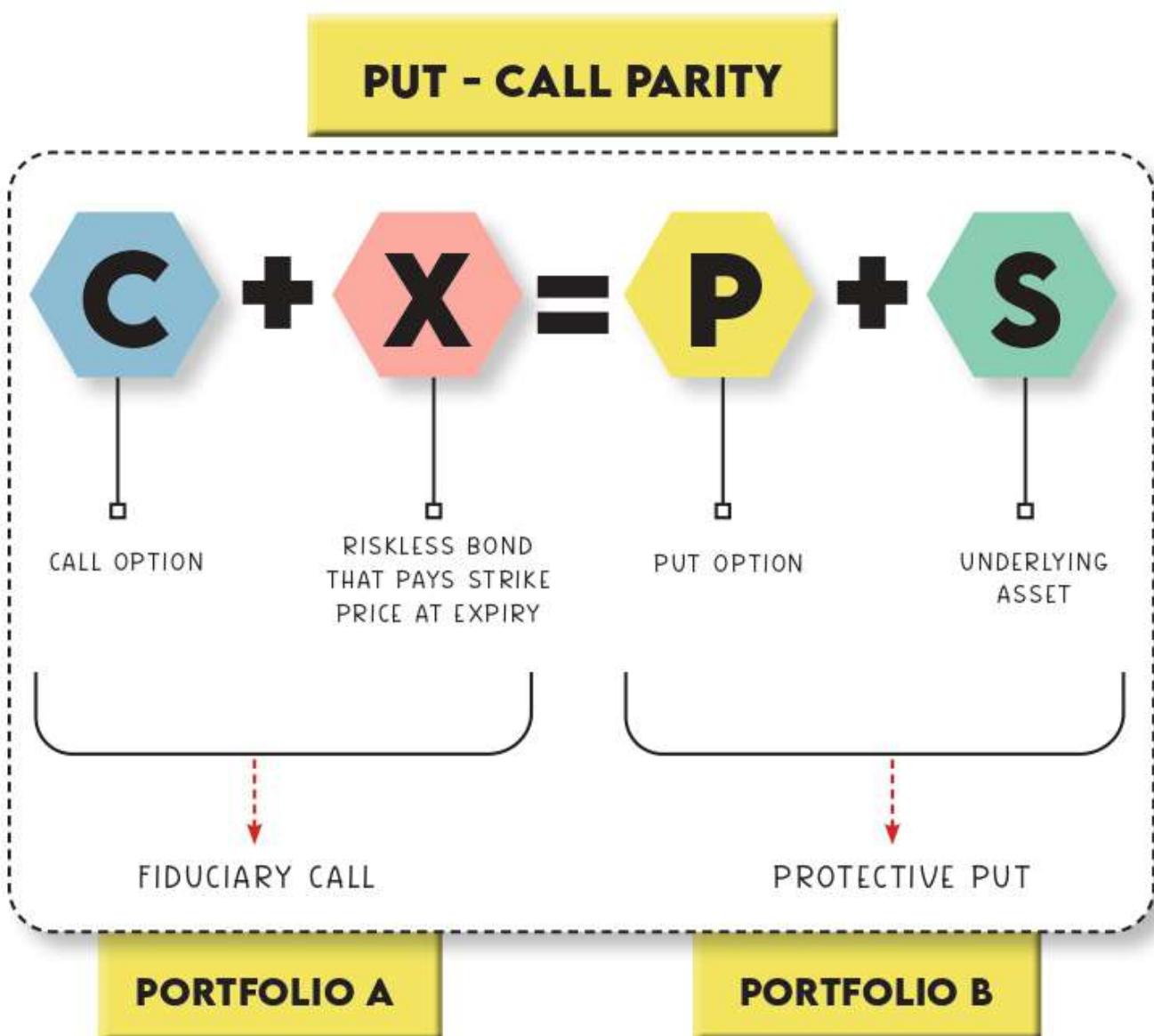
Professional Traders may enter into a trade to benefit from opportunities whenever Put-Call Relation is broken. Such arbitrage opportunities arise due to inefficiencies in the market.

## 7.2 WHAT DOES THE PUT CALL PARITY RELATIONSHIP SAY?



Explainer Video

Put Call Parity relationship says that a call option at a Strike Price + a Riskless Bond i.e., government bonds, that pays the same amount as the Strike Price of the option at expiry = a put option at the same Strike Price + Spot Price of underlying asset.



*For instance,*

Call Option at strike price ₹2200 is bought at a premium of ₹50.

Riskless Bond that pays ₹2200 strike price at expiry (say in 30 days) is bought today at ₹2170.

Put Option at strike price ₹2200 is bought at a premium of ₹220.

Underlying asset or stock's CMP = ₹2000.

Now, setting up a Put Call parity relationship between these we have,

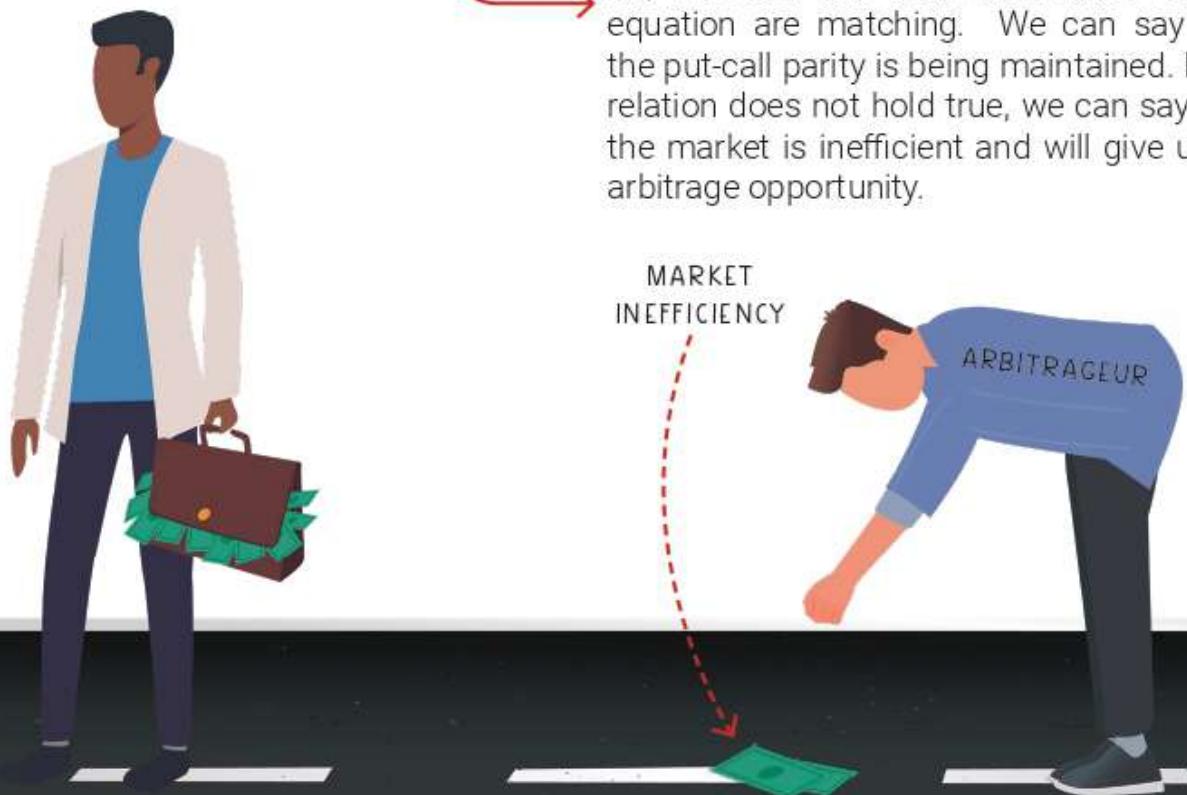
## PUT - CALL PARITY

**Call Option + Riskless Bond = Put Option + Underlying Stock**

$$\text{₹50} + \text{₹2170} = \text{₹220} + \text{₹2000}$$

$$\text{₹2220} = \text{₹2220}$$

So, we can see that both sides of the equation are matching. We can say that the put-call parity is being maintained. If the relation does not hold true, we can say that the market is inefficient and will give us an arbitrage opportunity.



The arbitrage traders can take positions in a manner that would give them a profit assuming that the Put-Call Parity is to restore itself. Such opportunities are difficult to spot and trade for retail traders.

**For instance,** let's say in the above equation the put option premium is found to be ₹400.

**Put Option premium = ₹~~220~~ ₹400**

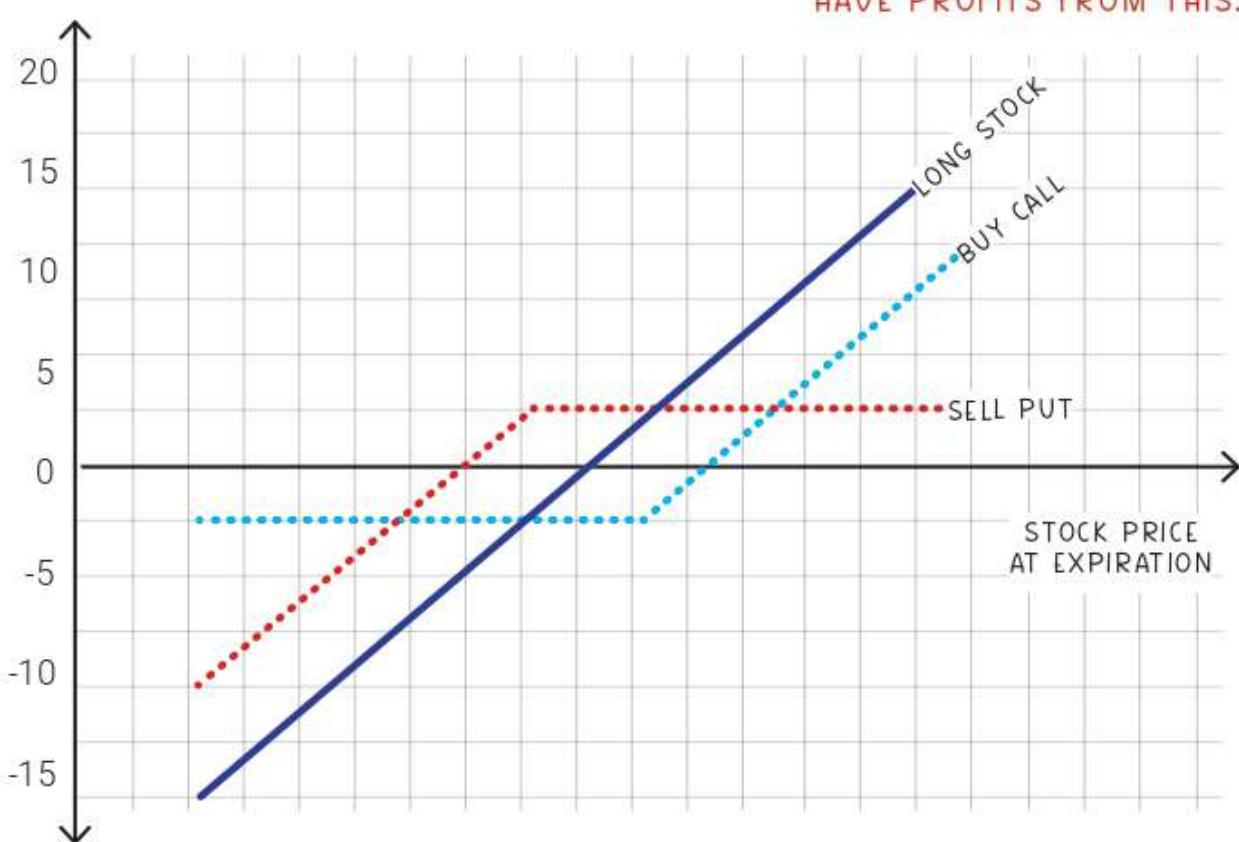
By the relationship of put-call parity, we can see that the put option is trading expensive. This is a case of market inefficiency and causes arbitrage opportunities for arbitrageurs or professional traders.

**Call Option + Riskless Bond = Put Option + Underlying Stock**

$$₹50 + ₹2170 = ₹400 + ₹2000$$

$$₹2220 = ₹2400$$

A TRADER MAY THEN  
FORM STRATEGIES TO  
HAVE PROFITS FROM THIS.



Note: The difference of some decimal points is not what we are talking about. We are talking about a substantial difference in the equation.

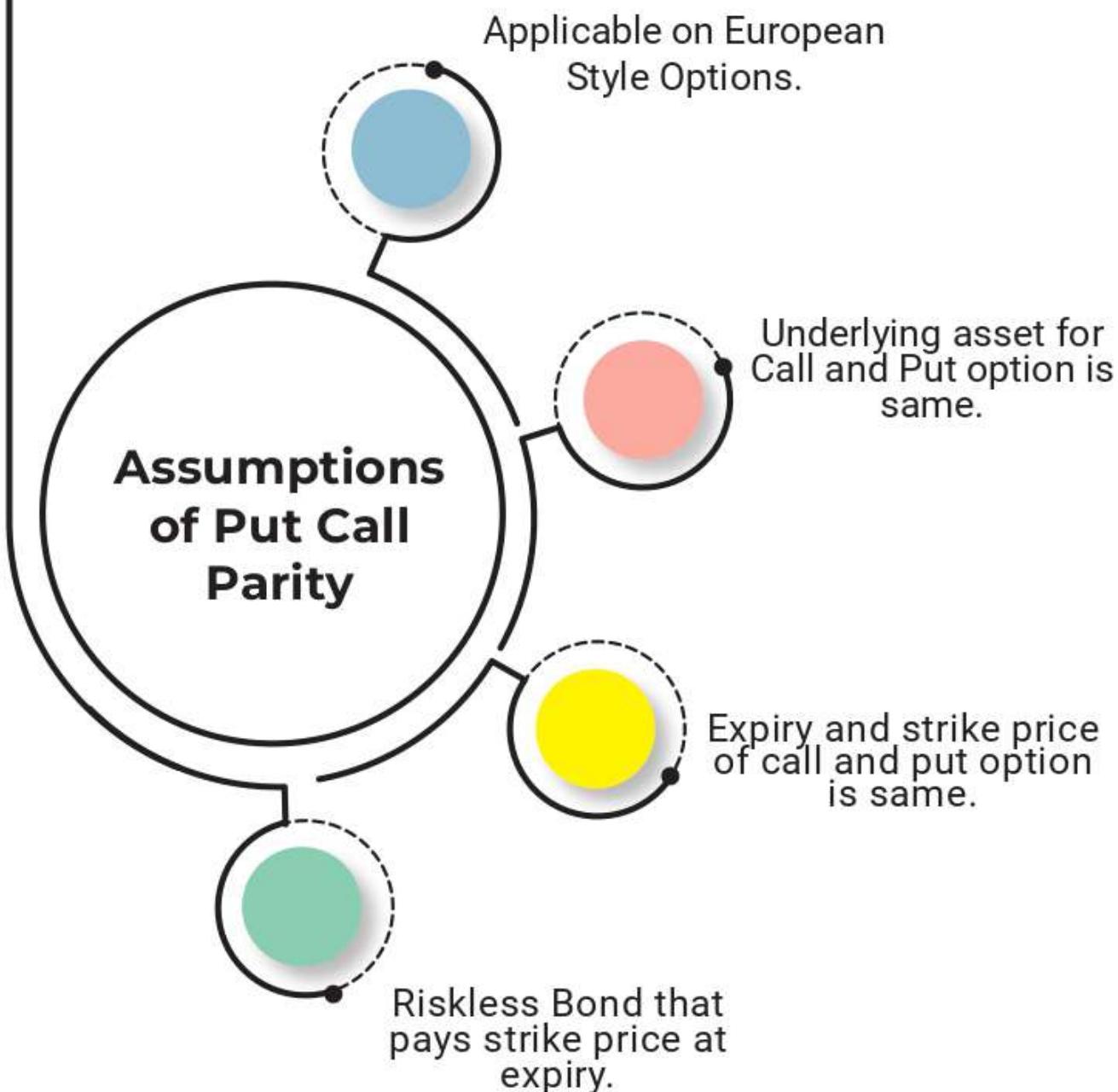
For instance, in this case, by taking a short position on the put option or long position on the call option, the trader can look to profit. The Put Call parity will restore itself by either the Put option going down in value or the premium on the call option increasing.



## 7.3 ASSUMPTIONS OF PUT CALL PARITY



Explainer Video



## Applicable on European Style Options.

Only applicable on European Options. European Options are options that can only be exercised on the expiry date. While we have another style of options called American Options that can be exercised any day before the expiry date. Typically, in the Indian Markets we have European Style Options only.



## Underlying asset for call and put option is same.

For instance, if the underlying asset is Reliance, then the call and put options should also be on this same underlying asset - Shares of Reliance Industries Limited



## Expiry and strike price of call and put option is same.

For instance, if the call strike price is ₹2200, then the put strike price should also be ₹2200. Both call option as well as the put option should have the same expiry as well.



## Riskless Bond that pays strike price at expiry.

It means that the bond should be discounted at risk-less rate of return and should pay the exact amount as Strike Price of the options on the date of expiry. For instance, a bond with a strike price of ₹2200 at expiry would be of a lesser value today (say ₹2170).



## 7.4 PUT CALL RATIO (PCR)

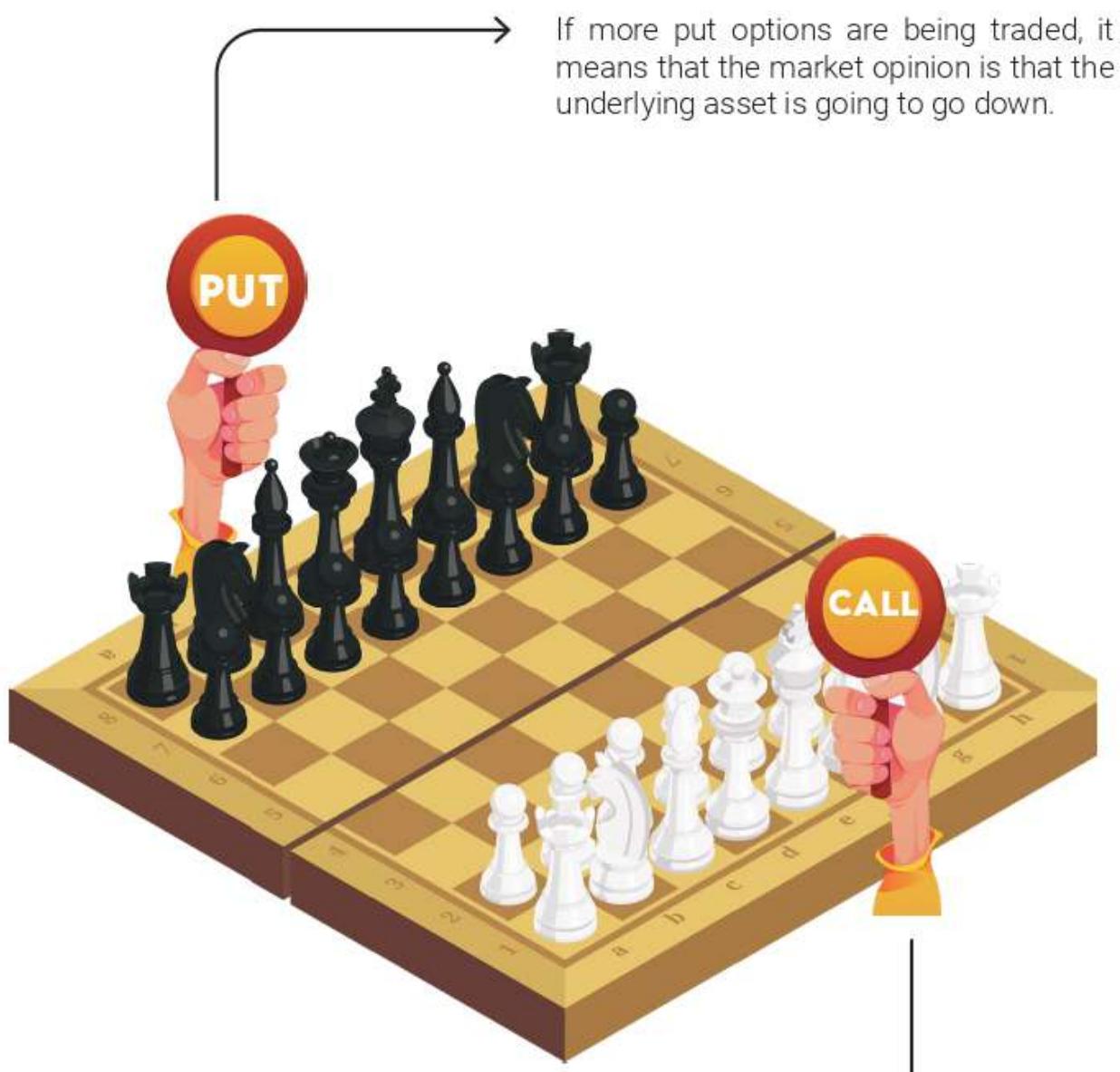


Explainer Video

WHY ARE MORE PUT OPTIONS BEING TRADED FOR AN ASSET AS COMPARED TO A CALL OPTION? DOES THIS MEAN ANYTHING?

WHY THE NUMBER OF CALL OPTIONS IN THE MARKET ARE GREATER THAN THE NUMBER OF PUT OPTIONS IN THE MARKET.?





“ PUT-CALL RATIO IS THE RATIO BETWEEN THE NUMBER OR VOLUME OF PUT OPTIONS AND THE NUMBER OR VOLUME OF CALL OPTIONS THAT ARE CURRENTLY BEING TRADED IN THE MARKET. ”

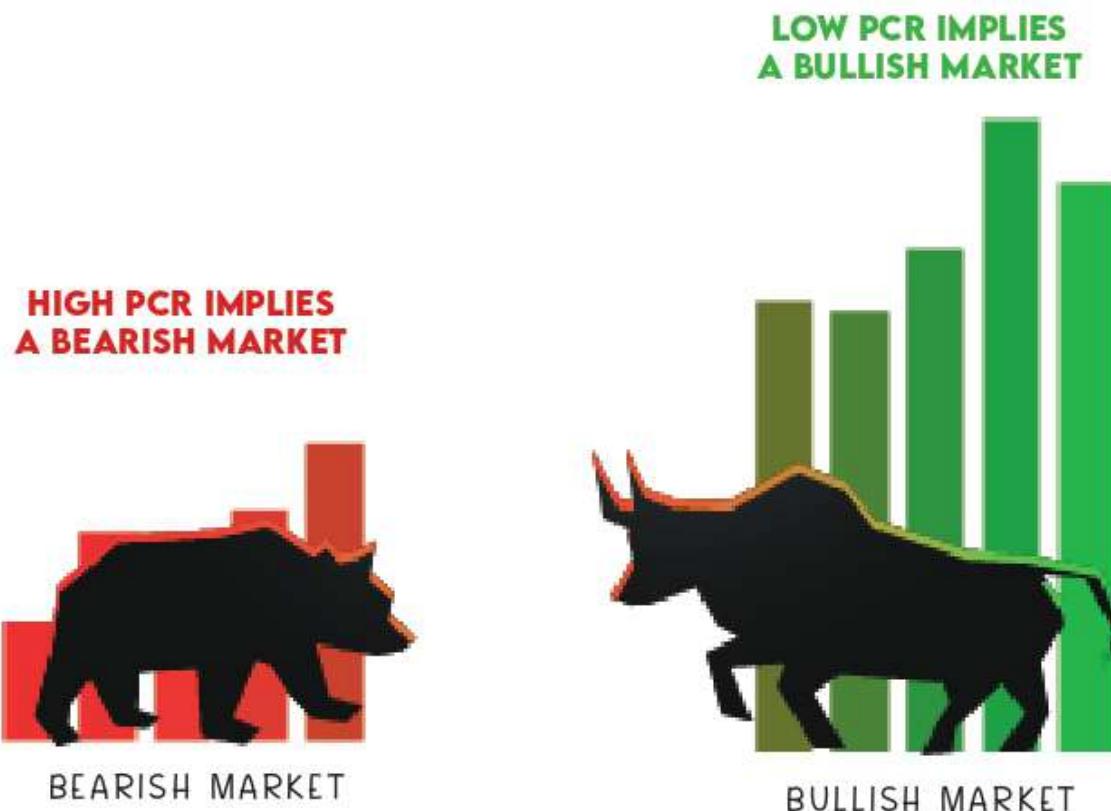
Alternatively, it can be calculated as open interest of all put options combined divided by open interest of all call options combined.

$$\text{Put-Call Ratio} = \frac{\text{Number/Volume of Put Options}}{\text{Number/Volume of Call Options}} = \frac{V_{PE}}{V_{CE}}$$

OR

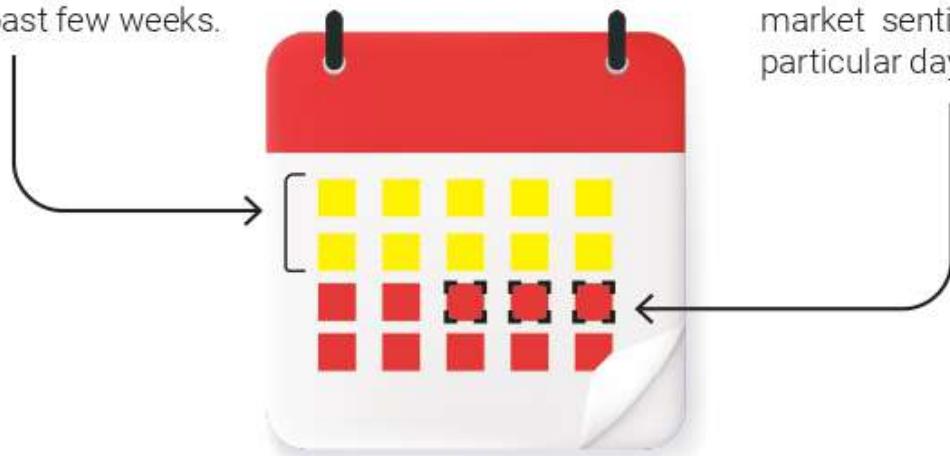
$$= \frac{\text{Open Interest Put Options}}{\text{Open Interest Call Options}} = \frac{OI_{PE}}{OI_{CE}}$$

The put-call ratio is, therefore, calculated as the proportion of total put options and call options trading on a particular day. It tells us if the market sentiment around that particular asset is bullish or bearish.



### PCR OPEN INTEREST

Put Call Ratio based on Open Interest shows the market sentiment for the past few weeks.



### PCR VOLUME

Put Call Ratio based on Volume of Options traded, shows the market sentiment on a particular day.

The PCR helps traders understand the overall sentiment of the market. It is an important indicator used to get a fair understanding of the markets



We can further use PCRs (Put Call Ratio) to plot points in a graphical representation to understand the trend of the put-call ratio in the market. We can use this graph to visually understand the sentiment in the market in the recent past. We can even understand the current sentiments in the market.



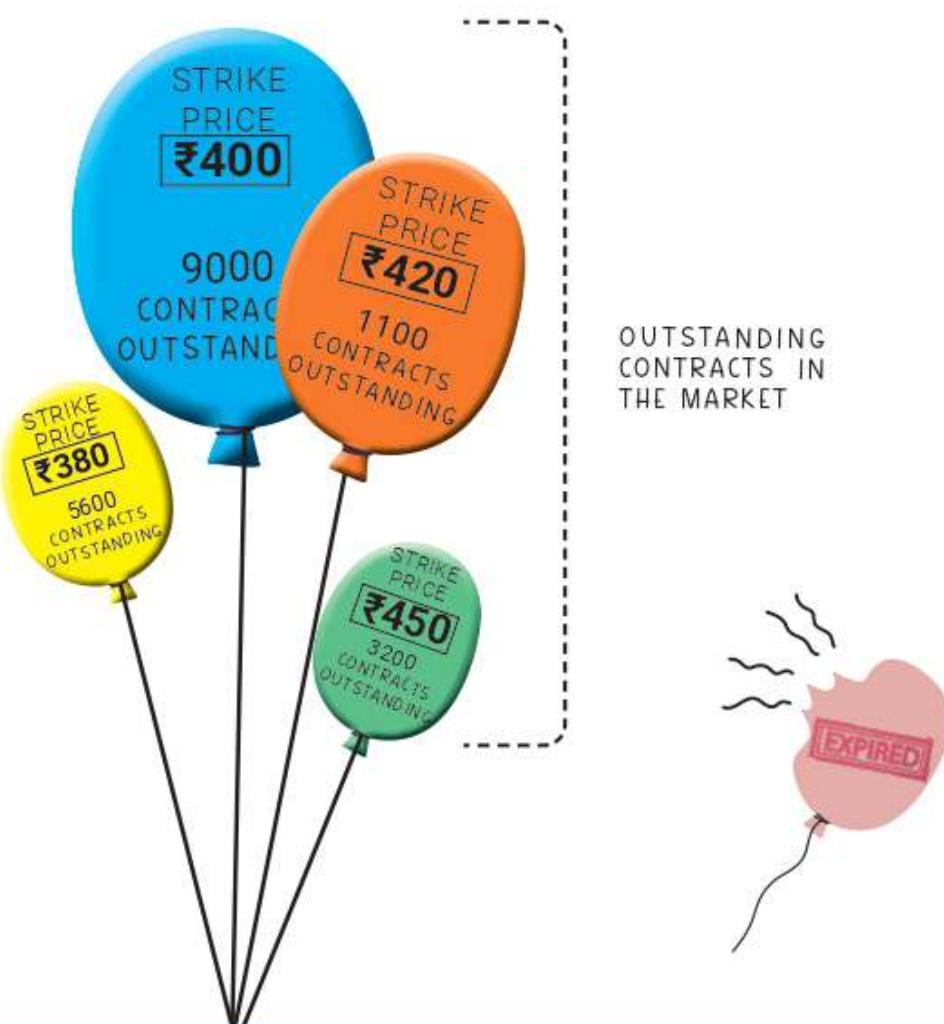
We can use the Put-call ratio for individual stocks and sectors as well. Put Call ratios are not a good indicator where overall trading volumes are low for the asset. This is because few trades can change the PCR but not really impact the market sentiment. As a result, this should only be used on Indices and large cap stocks.

## **CHAPTER 8**

# **OPEN INTEREST AND VOLUME**

- 8.1 Introduction**
- 8.2 How does Open Interest help us identify Support and Resistance Zones?**
- 8.3 What is an Option Chain?**
- 8.4 How to trade through Option Chain?**

## 8.1 INTRODUCTION



“ OPEN INTEREST MEANS THE TOTAL NUMBER OF CONTRACTS OUTSTANDING IN THE MARKETS AT DIFFERENT STRIKE PRICES. IT ACCOUNTS FOR ALL EXISTING CONTRACTS, WHETHER IT WAS MADE 5 DAYS AGO, 15 DAYS AGO, OR YESTERDAY, IT DOES NOT MATTER. ”



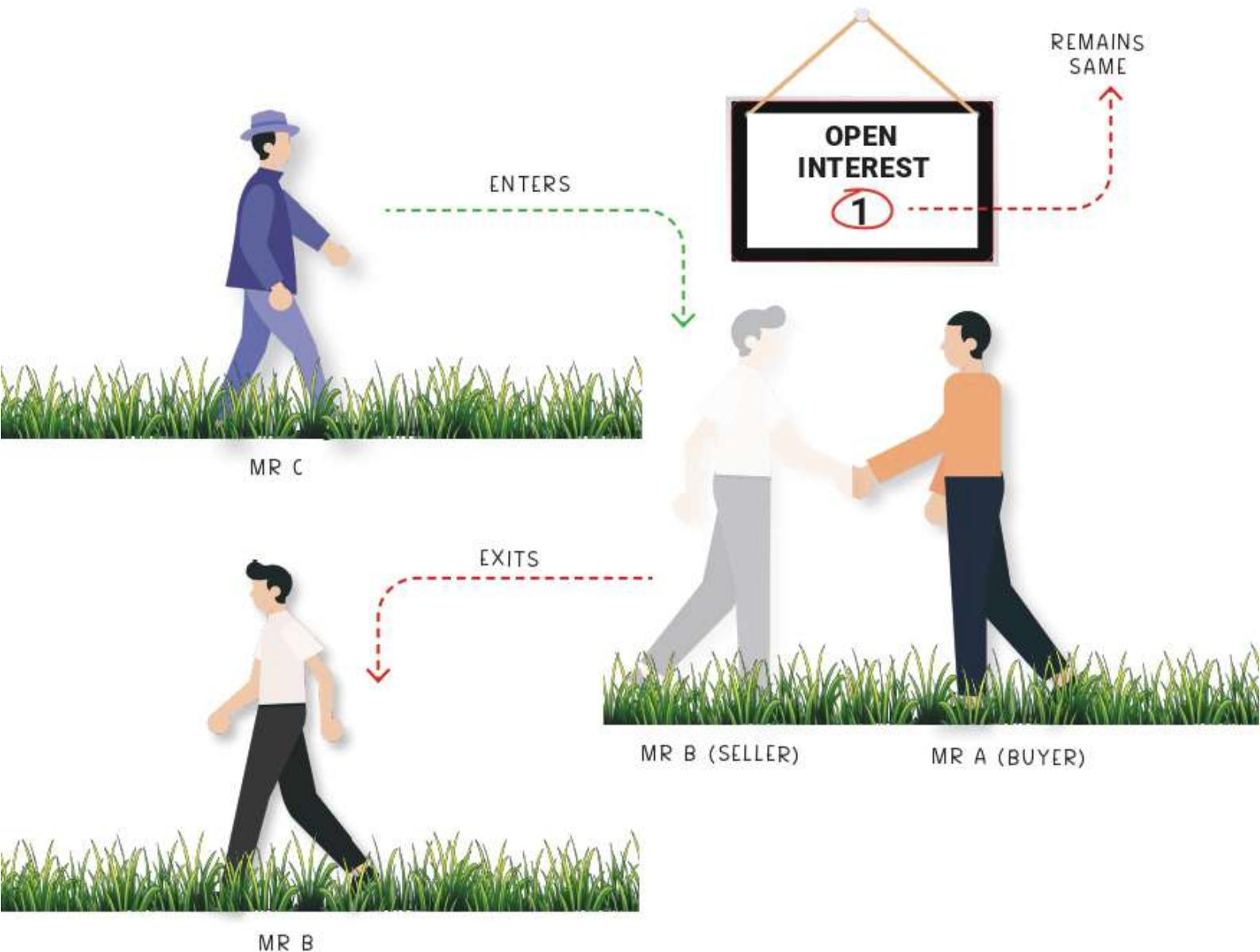
Whenever two people enter into a contract, the open interest goes up by +1.



And whenever two people square off existing positions or on expiry, the open interest goes down by 1.

However, if the existing contract positions are bought or sold, the Open Interest does not change.

**For instance**, the seller of a put option Mr B decides to get out of the contract. So, Mr B can sell the contract to Mr C (say) on the exchange, after meeting the obligations to date and then Mr C will replace his position in the contract. This buying and selling of the existing contracts would not affect the Open Interest.



Volume, on the other hand, would account for such secondary buying and selling of option contracts. So, if the same option is bought and sold 5 times, open interest will remain the same but the volume will be 5.

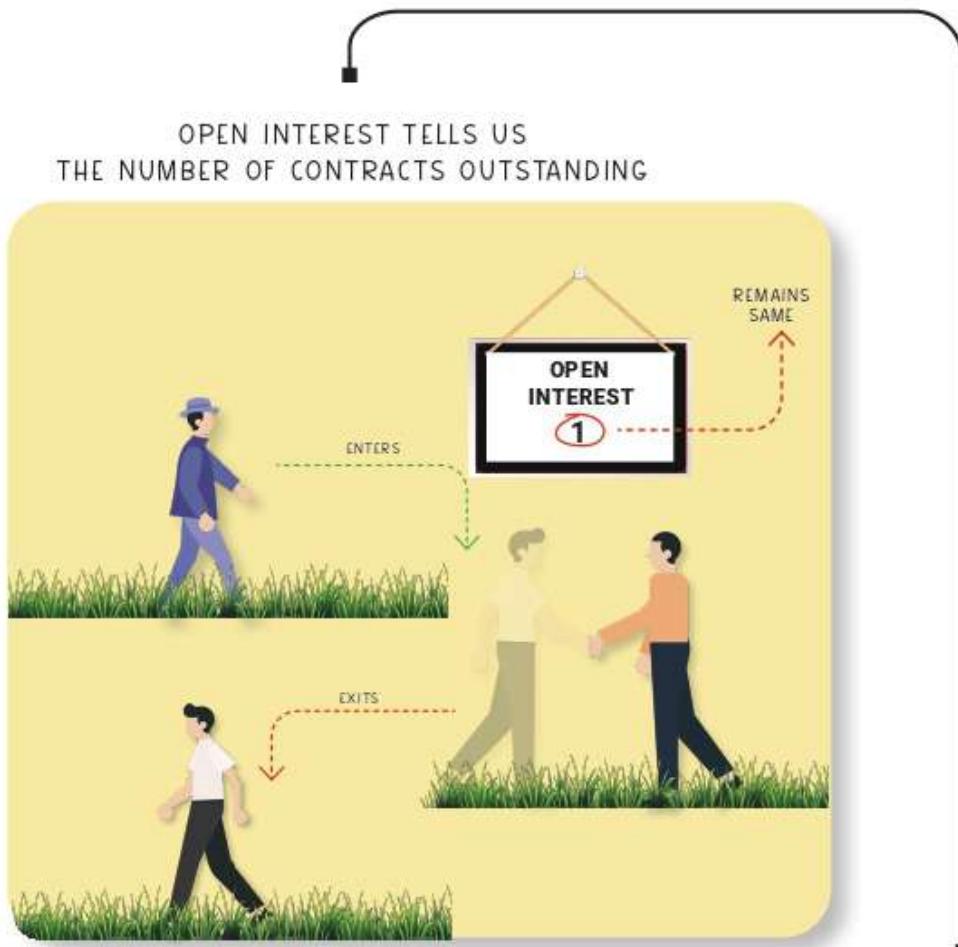
**VOLUME MEANS THE TOTAL NUMBER OF CONTRACTS BOUGHT OR SOLD FOR A SPECIFIC OPTION DURING A SPECIFIC TIME PERIOD.**

**For instance**, a contract entered by two people would mean Open Interest = 1. While internally the two parties might have sold the contract to some one else who might have sold it to other parties too. Here, the open interest will remain to be 1, but the trading volume will be much higher.



THIS BUY-SELL WILL MAKE THE VOLUME = 10 BUT THE OPEN INTEREST WOULD STAY THE SAME = 1.

## THIS IS HOW OPEN INTEREST AND VOLUME ARE DIFFERENT.



VOLUME TELLS US THE NUMBER OF CONTRACTS TRADED.



## 8.2 HOW DOES OPEN INTEREST HELP US IDENTIFY SUPPORT AND RESISTANCE ZONES?

Open Interest is also used to identify the support and resistance zones for stock price movements.

High levels of Open Interest in out of money call options acts as resistance. This means that a very large number of market participants have sold options at this level and a large number of them will help maintain selling pressure whenever the stock price tests that level. As a result, these levels act as resistance levels and market needs really high buying pressure to overcome this level.

**RESISTANCE  
38K-41K FEET**

VERY HIGH LEVELS OF OPEN INTEREST IN CALL OPTIONS



VERY HIGH LEVELS OF OPEN INTEREST IN PUT OPTIONS

**SUPPORT  
28K-31K FEET**

High levels of Open Interest in out of money put options acts as Support levels. This means that as the market prices fluctuate, whenever they come down to test these levels with really high out of money put options sold, there will be buying pressure to support price from falling. This is why such levels with really high Open Interest indicate support levels.

This way we can find the different areas where the open interests are remarkably high and accordingly find support and resistance zones for a stock.

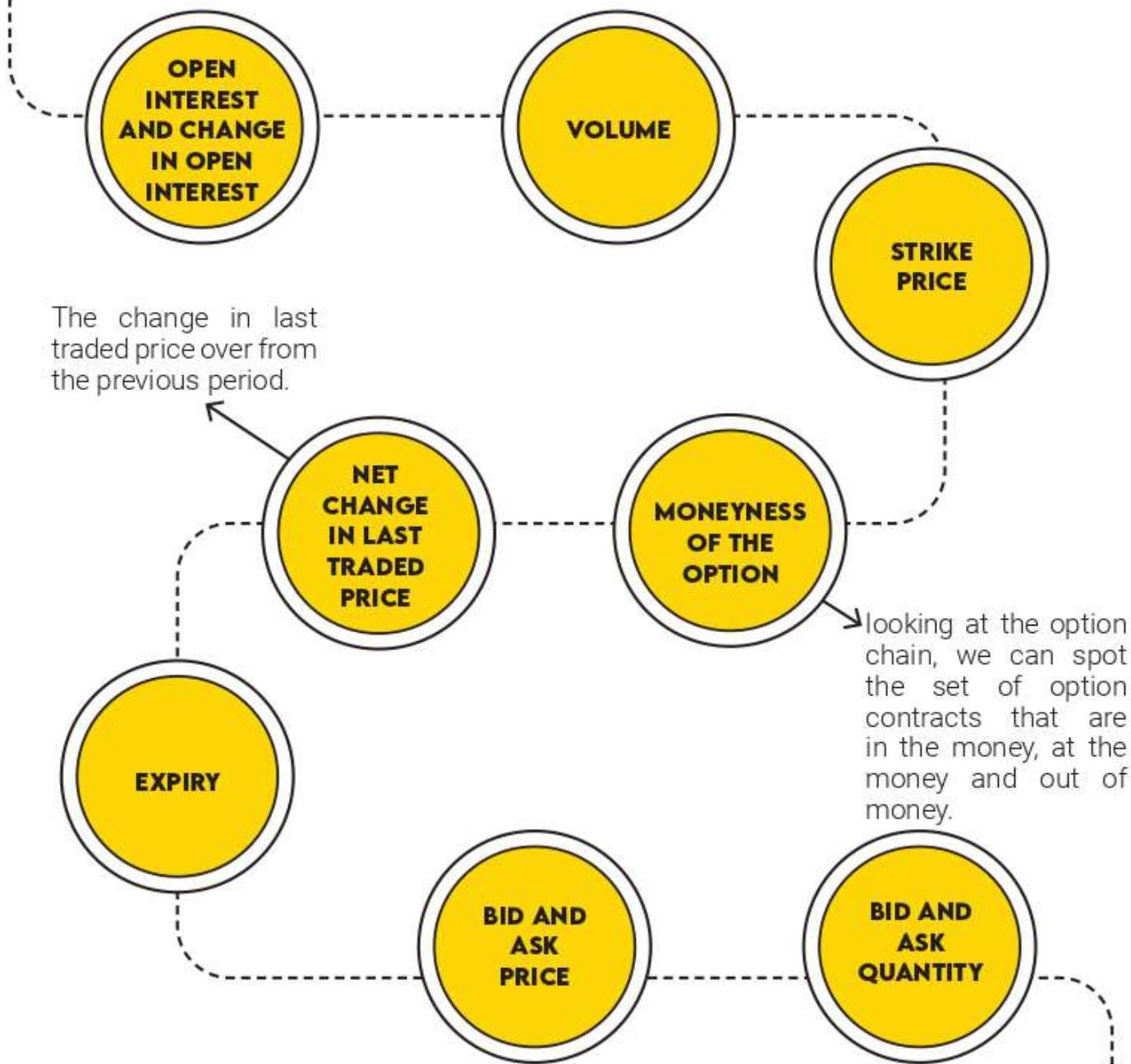
## 8.3 WHAT IS AN OPTION CHAIN?



Explainer Video

An Option Chain is a list of all available option contracts, both call and put, for a given underlying asset. These can be underlying asset of any kind.

In any option chain, we will find the following details about each options contracts -



Option Chains are widely used to get essential information about the markets to strategize trades with options. Traders get insight from this data. You can look at a detailed option chain on the next page.

Symbol	Q	CALLS						PUTS																		
		CHNG IN DI	VOLUME	IV	LTP	BID	ASK	BID QTY	STRIKE	BID QTY	ASK QTY	CHNG IN DI	IV	VOLUME	CHNG IN DI	IV										
ITC	1	-	-	-	-	350	1,579.20	1,649.45	1,500	16,300.00	1,900	1.05	1.10	1,200	0.10	1.10	49,985	26,137	-139	30,059						
ITC	-	-	-	-	-	1,500	1,470.20	1,612.15	1,500	16,350.00	2,800	1.00	1.10	1,400	0.05	1.05	48,41	1,751	17	348						
ITC	-	-	-	-	-	1,800	1,479.90	1,553.40	1,500	16,400.00	3,750	1.00	1.05	1,400	0.10	1.05	46,71	4,552	-176	1,502						
ITC	-	-	-	-	-	1,800	1,431.15	1,503.40	1,500	16,450.00	1,750	1.00	1.10	1,950	0.05	1.05	45,52	1,284	31	316						
ITC	-6	60	-	1,401.55	-203.45	850	1,411.05	1,415.70	400	16,500.00	7,950	1.15	1.20	34,750	0.10	1.15	44,53	77,350	-2,073	70,376						
ITC	-	-	-	-	-	50	1,330.05	1,400.35	1,500	16,550.00	1,950	1.15	1.20	2,250	0.20	1.20	43,28	2,219	92	747						
ITC	-	-	-	-	-	200	1,294.20	1,338.80	200	16,600.00	1,850	1.10	1.15	2,000	0.10	1.15	41,39	7,950	-26	4,609						
ITC	-2	-	-	-	-	50	1,237.85	1,310.00	1,500	16,650.00	1,600	1.15	1.20	850	0.10	1.20	40,35	6,362	297	757						
ITC	-16	-	-	-	-	150	1,194.75	1,236.30	200	16,700.00	9,600	1.15	1.20	3,950	0.05	1.20	38,88	33,989	1,303	9,424						
ITC	-2	-	-	-	-	50	1,130.40	1,188.35	50	16,750.00	2,400	1.15	1.20	560	0.20	1.20	37,22	15,234	-118	1,877						
ITC	-34	-	-	-	-	200	1,102.50	1,133.65	1,800	16,800.00	21,550	1.15	1.20	1,800	-	1.15	35,94	40,369	372	17,775						
ITC	-	-	-	-	-	100	1,035.40	1,065.35	100	16,850.00	650	1.25	1.30	2,250	0.20	1.30	34,64	13,301	-167	1,420						
ITC	-16	-	-	-	-	200	990.15	1,033.80	200	16,900.00	5,250	1.35	1.40	10,250	0.15	1.35	33,48	58,863	929	16,763						
ITC	-2,556	-162	-	-	-	2,650	951.60	977.65	2,650	16,950.00	800	1.40	1.45	1,500	0.15	1.40	32,28	15,569	-83	2,508						
ITC	-15	10	-	-	-	400	915.85	916.90	100	17,000.00	30,150	1.55	1.60	6,700	0.15	1.60	31,17	21,266	-8,370	7,947						
ITC	-229	119	-	-	-	200	921.20	-189.55	400	17,050.00	2,850	1.70	1.75	4,000	0.30	1.70	30,00	20,717	-876	3,465						
ITC	-137	-	-	-	-	200	755.00	781.25	200	17,150.00	4,300	1.95	2.00	5,450	0.25	1.95	27,31	27,168	973	5,894						
ITC	-350	3	-	-	-	29,61	719.25	-186.70	400	7,665	717.65	400	17,200.00	11,200	1.95	2.00	21,350	0.30	1.95	25,63	140,394	4,479	44,725			
ITC	-57	-	-	-	-	4,700	675.25	4,150	651.20	675.25	4,150	2,20	2,25	4,350	0.50	2,25	24,59	43,195	-95	10,275						
ITC	-234	10	-	-	-	145	25.96	624.20	-188.55	450	616.90	517.85	850	17,300.00	14,750	2,65	2,70	2,650	0.65	2,70	23,64	1,89,127	3,583	43,776		
ITC	-5,832	678	-	-	-	9	31.83	581.05	-191.70	450	565.10	573.15	450	17,350.00	7,050	2,90	2,95	10,550	0.75	2,90	22,24	74,212	-1,015	12,553		
ITC	-614	87	-	-	-	20,63	370.10	-169.90	400	371.60	372.50	500	17,550.00	11,050	6,55	6,55	250	3,40	6,55	13,250	1,25	3,55	21,24	340,810	8,656	63,833
ITC	-1,855	726	-	-	-	23.17	463.90	-208.95	400	468.95	470.30	400	17,450.00	7,500	4,15	4,20	4,800	1,60	4,20	20,12	1,88,950	2,383	27,376			
ITC	-988	65	-	-	-	2,896	17.78	279.30	-186.80	150	278.05	278.85	50	17,650.00	7,100	12,70	12,80	11,750	8,05	12,75	16,87	5,65,017	537	1,11,437		
ITC	-5,904	1,400	-	-	-	38,078	16.90	234.80	-183.10	150	234.70	235.30	200	17,700.00	2,800	18,70	18,80	16,900	12,50	18,60	16,51	12,96,950	27,065	1,06,791		
ITC	-4,443	632	-	-	-	18,759	16.56	194.00	-176.40	50	193.20	193.75	750	17,750.00	3,300	27.45	18,00	19,40	27,45	16,23	8,18,479	22,24	52,958			
ITC	-27,956	13,423	-	-	-	2,00,050	16.39	156.75	-164.50	200	156.20	156.50	100	17,800.00	1,250	40,05	14,00	29,05	40,05	16,17	20,92,351	497	1,19,254			
ITC	-14,541	10,293	-	-	-	1,41,208	16.26	123.10	-151.50	100	122.70	123.00	1,350	17,850.00	1,450	56,50	1,100	41,85	56,65	16,03	11,42,456	3,407	51,981			
ITC	-1,11,004	96,043	-	-	-	9,35,826	16.20	94.15	-151.70	300	93.90	94.10	2,300	17,900.00	1,000	77,70	77,00	350	56,95	77,00	16,01	25,62,215	17,946	1,16,241		

Source: <https://www.nseindia.com/>

## 8.4 HOW TO TRADE THROUGH OPTION CHAIN?

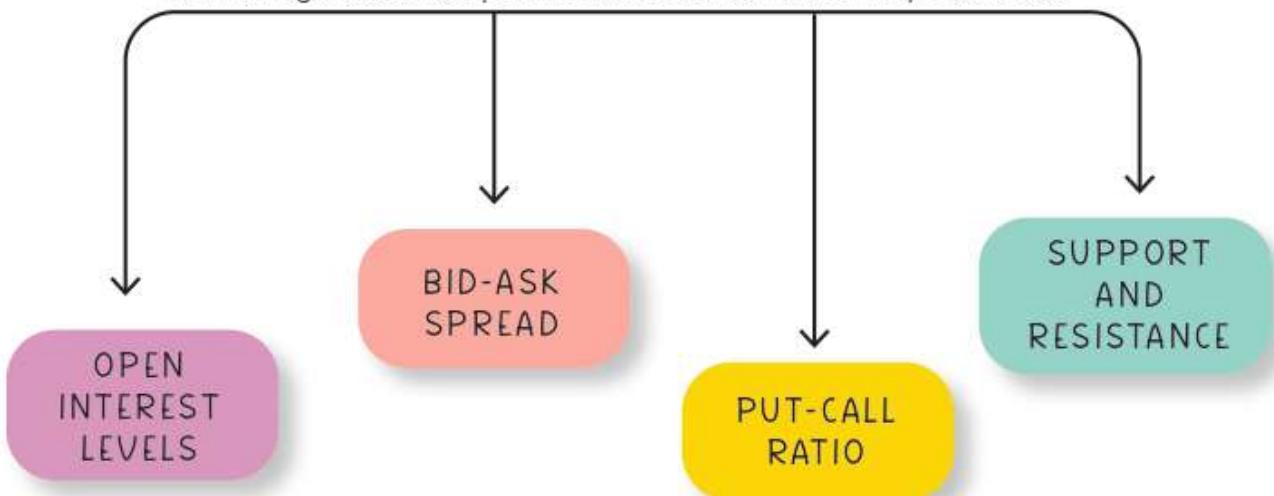


Explainer Video



As we saw in the previous module, option chain provides us with lot of information which can be used by professional traders to draw conclusions and accordingly take a trade. It also comes in really handy when creating option trading strategies.

Few things that the option chain tells us which helps us trade -



The execution of trade is dependent on these factors. This makes an option chain even more important when executing option strategies as these factors determine if we can actually execute a strategy or not. We can even play around with the option chain, by looking for different assets or even different strike prices. This will further help us understand options better.

As we spend more and more time with the options chain, we develop an eye for details. This way we can draw better insights from the same data and improve our trades. Try spending time with it and apply some of the simple calculations that we have learned so far.

# Notes

# CHAPTER 9

# OPTION PRICING

- 9.1 Introduction**
- 9.2 Components of premium of options**
- 9.3 Factors affecting the Price or Value of an option**
- 9.4 Black Scholes Pricing Model**
- 9.5 Variables affecting the pricing as per Black Scholes Model**
- 9.6 What are Option Greeks?**

## 9.1 INTRODUCTION



Explainer Video

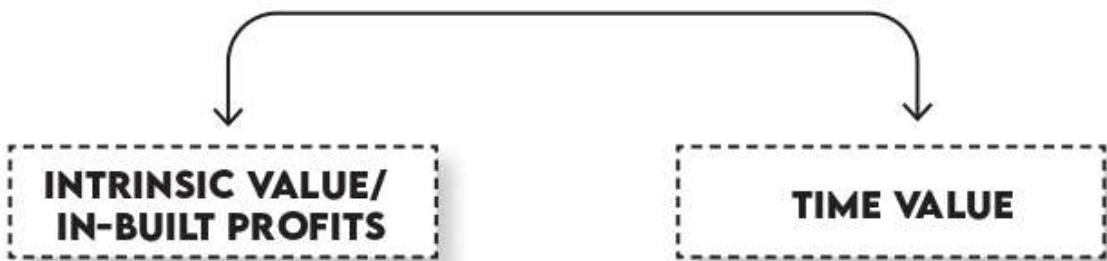


Now that we are clear with the fundamentals of options, let us look at how pricing of options works and what factors affect them.

While we talk about options pricing, we are referring to the premium of the option. We will discuss how the pricing of the premium works to enter the contract. We will understand what factors affect them. Remember, exact pricing of options is a really complicated method and is not required for trading. For us here, it is important to understand how it works and the factors that affect it. We will not learn to find the exact price or premium for any given option.

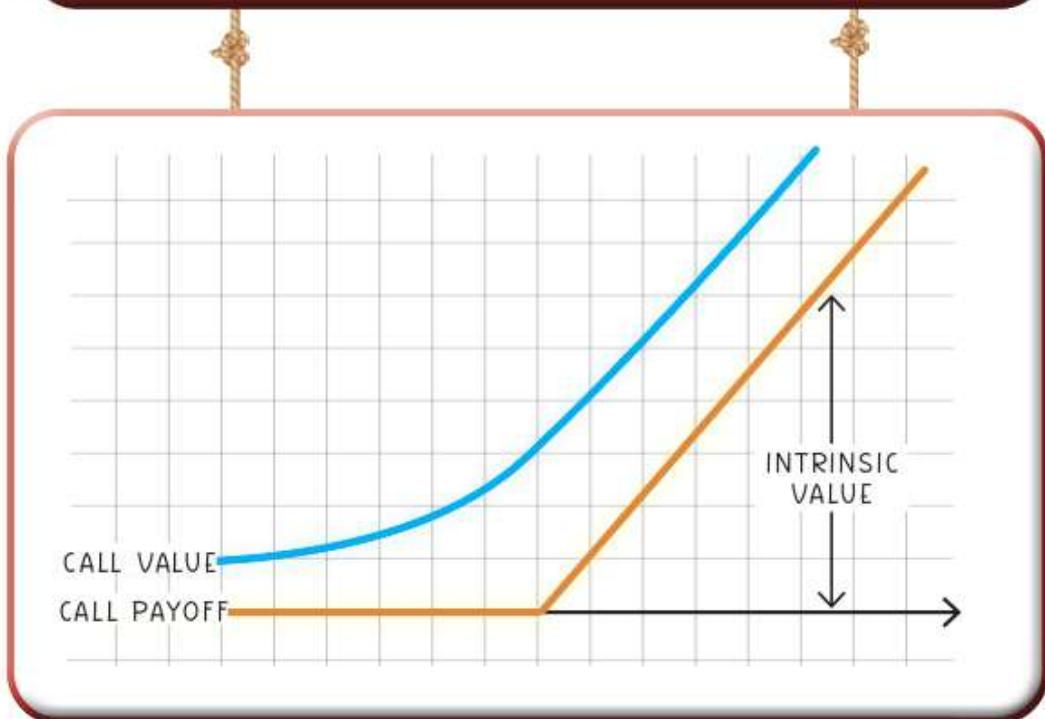
## 9.2 COMPONENTS OF PREMIUM OF OPTIONS

The premium of options basically consists of two components.



### INTRINSIC VALUE/ IN-BUILT PROFITS

“THE INTRINSIC VALUE OF AN OPTION IS ITS IN-BUILT VALUE. IT CAN ALSO BE UNDERSTOOD AS IN-BUILT PROFITS AT THE TIME OF TAKING THE TRADE.”



In-built value only exists for In the money Options. The difference between the Strike Price and Market price of the underlying asset gives the In-built profit value. For Out of money and At the Money Options, the In-built profit value is zero.

Note - *Intrinsic Value* may not be the best term to describe the *In-built value* but due to lack of better word and how beginners understand *intrinsic value*, we use the word - *Intrinsic Value* here. In finance at large, *Intrinsic Value* has a different meaning. It means - The True Value of any asset.

- For Call Option,

IN-BUILT VALUE = PRICE OF UNDERLYING ASSET - STRIKE PRICE

- For put Option,

IN-BUILT VALUE = STRIKE PRICE - PRICE OF UNDERLYING ASSET

**For instance**, using the option chain for a call option you have,



The In-Built Value then, for the call option, will be,

**Price of the Underlying Asset – Strike Price.**

**₹15,752 – ₹15,700**

**₹52**

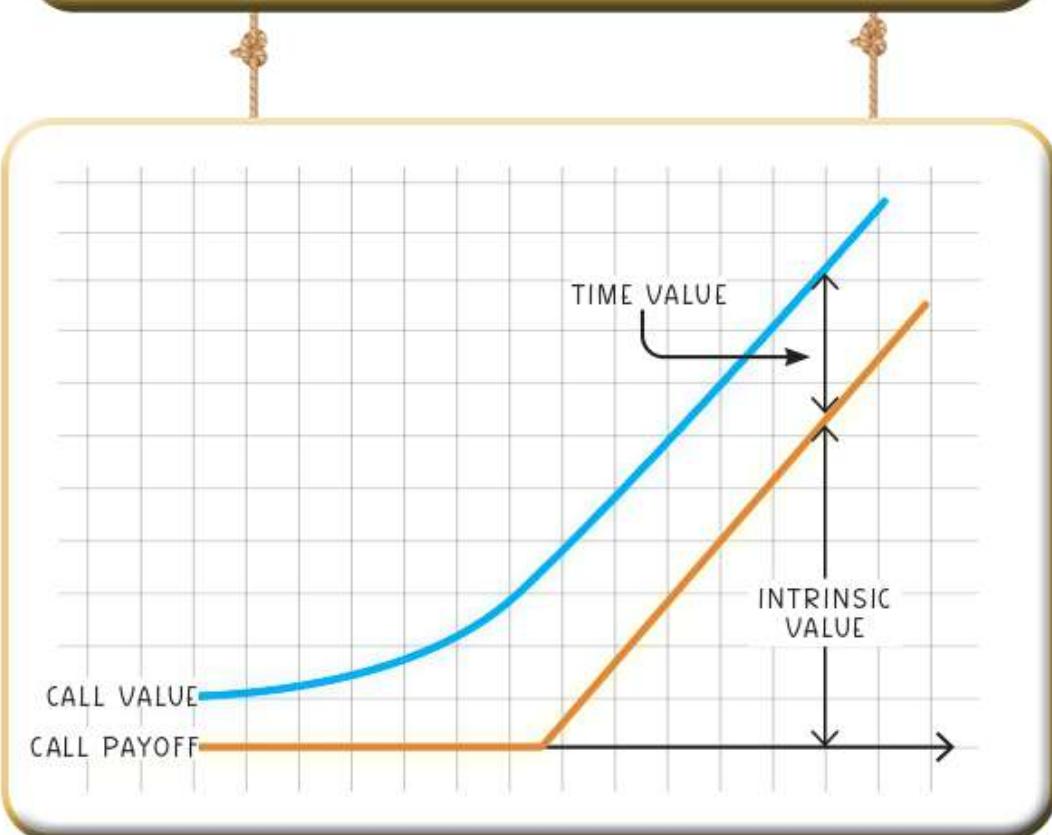
THIS **₹52** IS THE IN-BUILT PROFIT OF  
THE OPTION EMBEDDED IN THE PREMIUM  
AMOUNT.

## TIME VALUE

“

”

THE TIME VALUE PREMIUM IS THE PREMIUM THAT OPTION BUYER PAYS TO THE OPTION SELLER TO COMPENSATE FOR THE RISK THAT THE SELLER IS TAKING.



The option seller is assuring limited losses and unlimited profit potential to the buyer based on stock price movement in a certain time frame and is being compensated for the same. The buyer pays this to enjoy unlimited profit potential and limited losses.

**For instance,**

as we use the option chain for values in the above example, we saw that the premium was ₹199 and in-built profits were ₹52.

Now, since the intrinsic value part is ₹52, the surplus must be the time value.

**Time Value = Premium amount – Intrinsic value**

$$= ₹199 - ₹52$$

$$= ₹147$$

Time Value in an option depends a lot on the time left till expiry. Option with expiry in one week will have less premium as compared to the option with expiry in one month.



We may frame its equation like this,

$$\text{OPTIONS PREMIUM} = \boxed{\text{INTRINSIC VALUE /IN-BUILT PROFITS}} + \text{TIME VALUE}$$



- INTRINSIC VALUE ( CALL OPTION ) = PRICE OF UNDERLYING ASSET - STRIKE PRICE
- INTRINSIC VALUE ( PUT OPTION ) = STRIKE PRICE - PRICE OF UNDERLYING ASSET

- ✓ Intrinsic value can be calculated only for In the Money (ITM) options.
- ✓ In At the money (ATM) and Out of the Money (OTM), Intrinsic value will be Zero.

Let us try to solve a hypothetical calculation.  
Given: For a stock trading on the exchange,



Find the Intrinsic value and the time value of this ITM call option.

Let's find them together,

$$\begin{aligned}\text{Intrinsic value/ In-built profits} &= \text{Stock price} - \text{Strike price} \\ &= ₹1000 - ₹900 \\ &= ₹100\end{aligned}$$

Now,

$$\text{Option Premium} = \text{Intrinsic value/ In-built profits} + \text{Time value}$$

$$\begin{aligned}\text{So, Time value} &= \text{Option Premium} - \text{Intrinsic value/ In-built profits} \\ &= ₹150 - ₹100 \\ &= ₹50\end{aligned}$$

There we have the two components of option premium. This is how we can solve for other options too.

*The only thing to note here is that for ITM options we have an in-built profit value. But for ATM or OTM options, Option premium = Time value of option. This is because, for ATM and OTM the in-built profit value is zero, i.e., they do not have any in-built profits in them.*

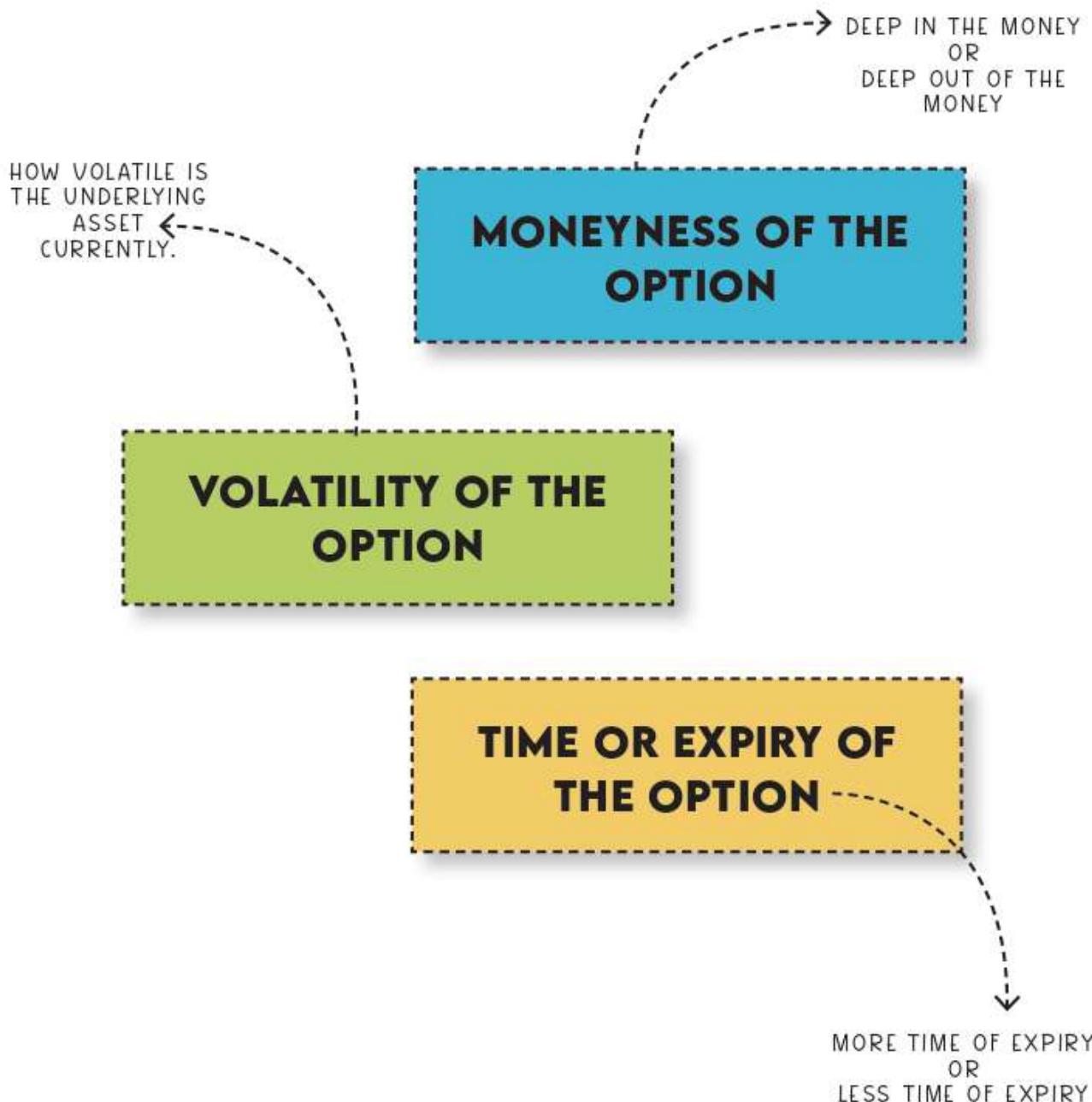
Try to practice some more practical option pricing questions through the option chain on NSE. Find the in-built profit and time value in the premium amount. Get the hang of it.

# 9.3 FACTORS AFFECTING THE PRICE OR VALUE OF AN OPTION



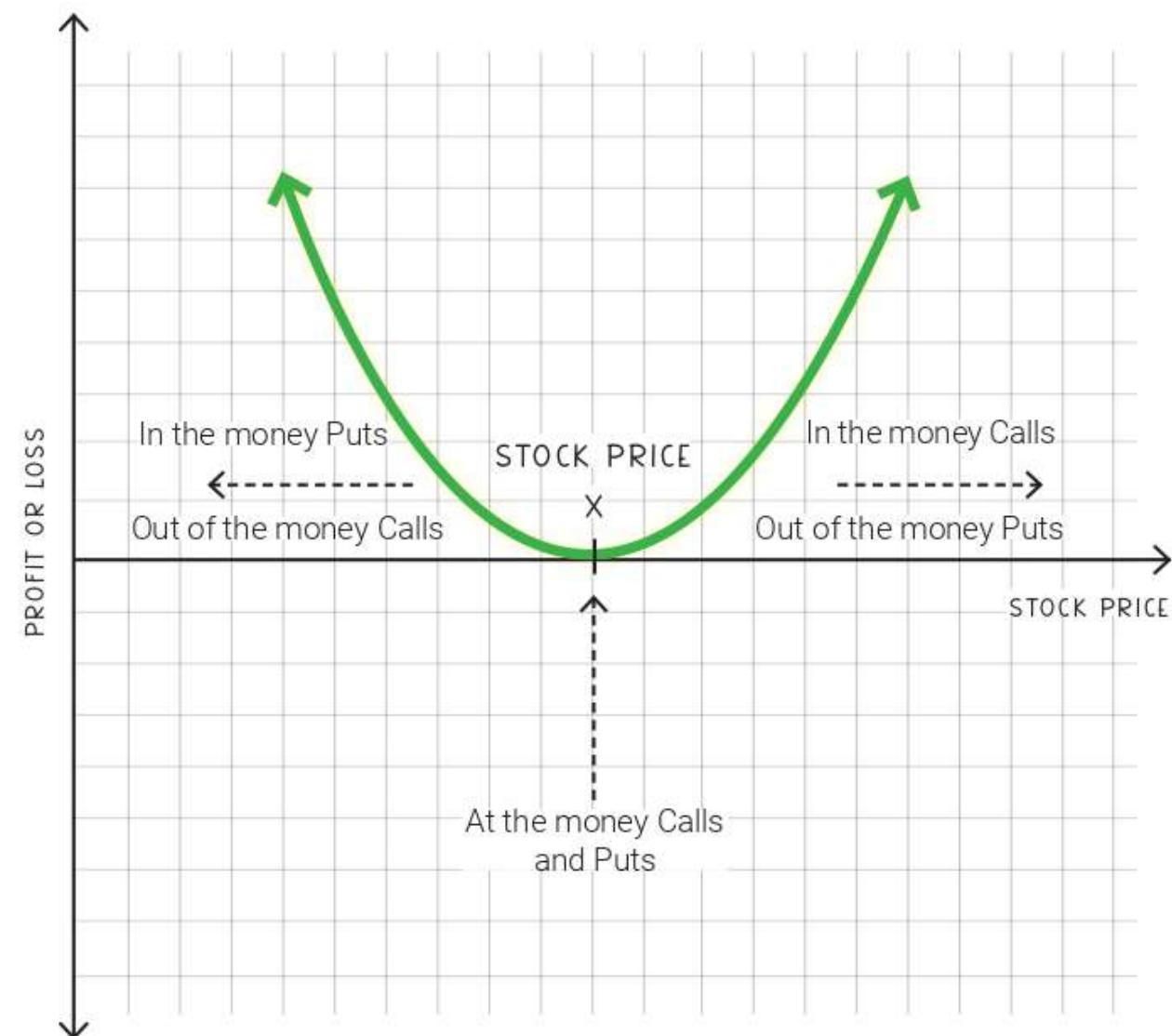
Explainer Video

Now that we understand the very basics of premium amount, lets go ahead and understand some factors that affect the price of the option.



## MONEYNESS OF THE OPTION

As the option goes deep in the money, the option price increases. And as we go deep out of the money, the option price decreases.



As discussed earlier, the price of the option has intrinsic value as one of its components. So, as we go deep into the money, the option price increases with the increase in in-built profits. While as we go deep out of the money, the in-built profits are zero and so the option price decreases.

## VOLATILITY OF THE OPTION

As uncertainties in the market increase, the price movement and therefore volatility goes up.

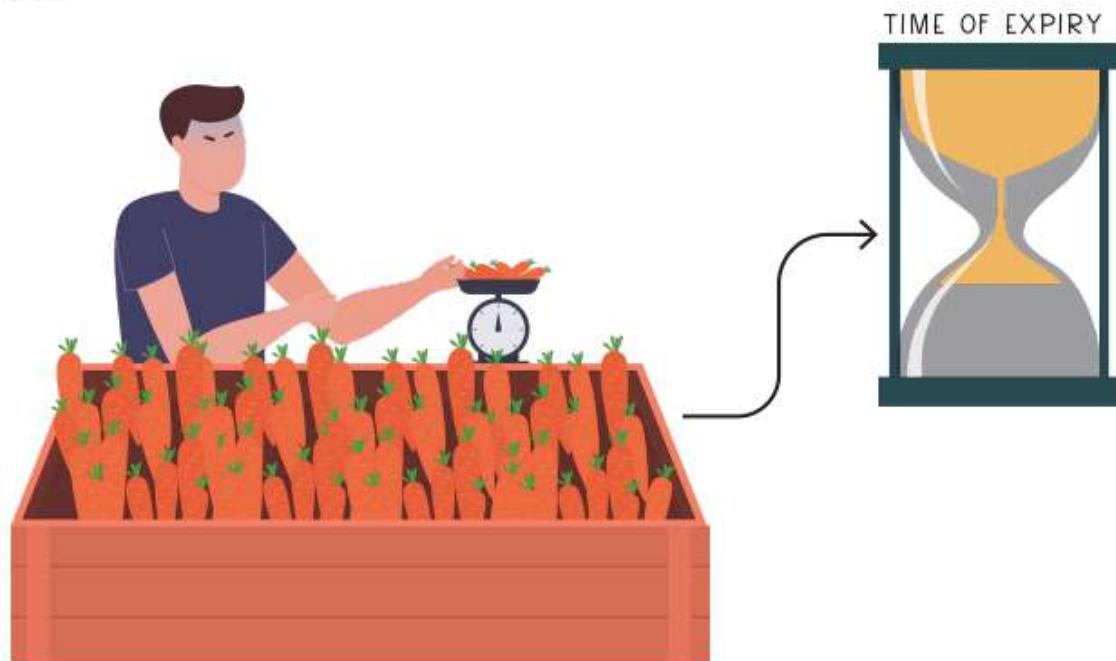
In such circumstances, the risk for the seller of the option increases. Therefore, the seller wants an additional premium to sell the contract as they may have large losses later.



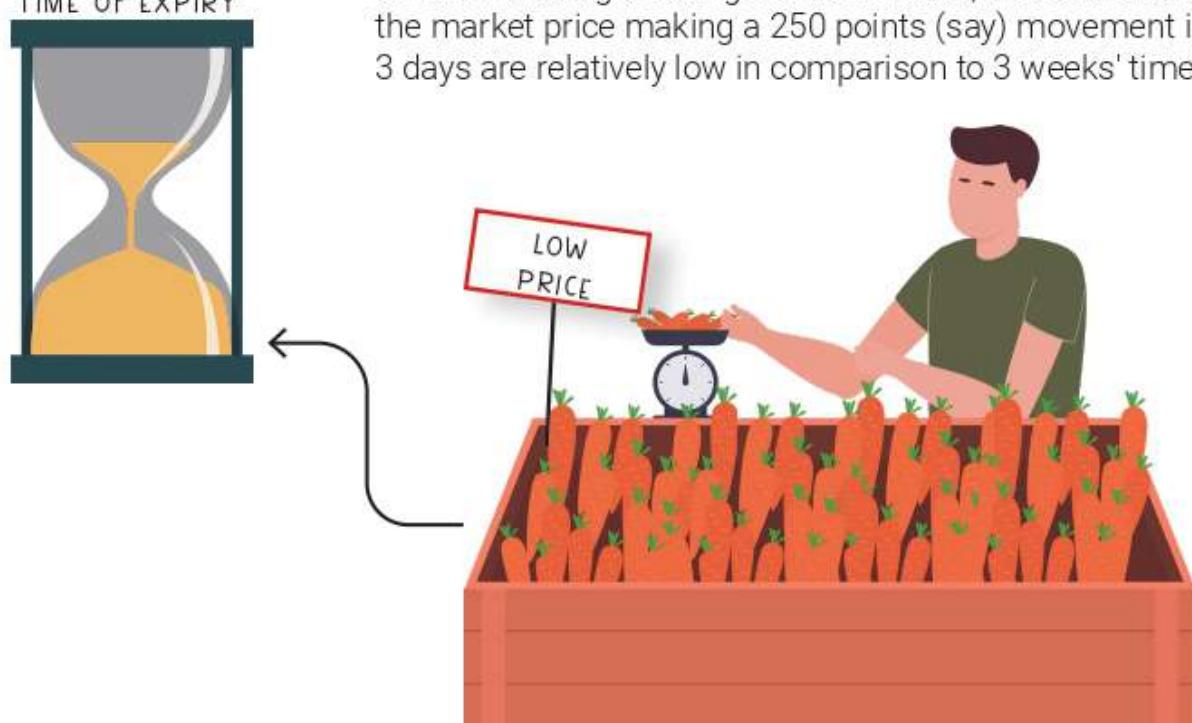
On the other hand, as the volatility in the market is low, the chances of seller making losses is also low. Therefore, the seller would sell the option at lower price too.

## TIME OR EXPIRY OF THE OPTION

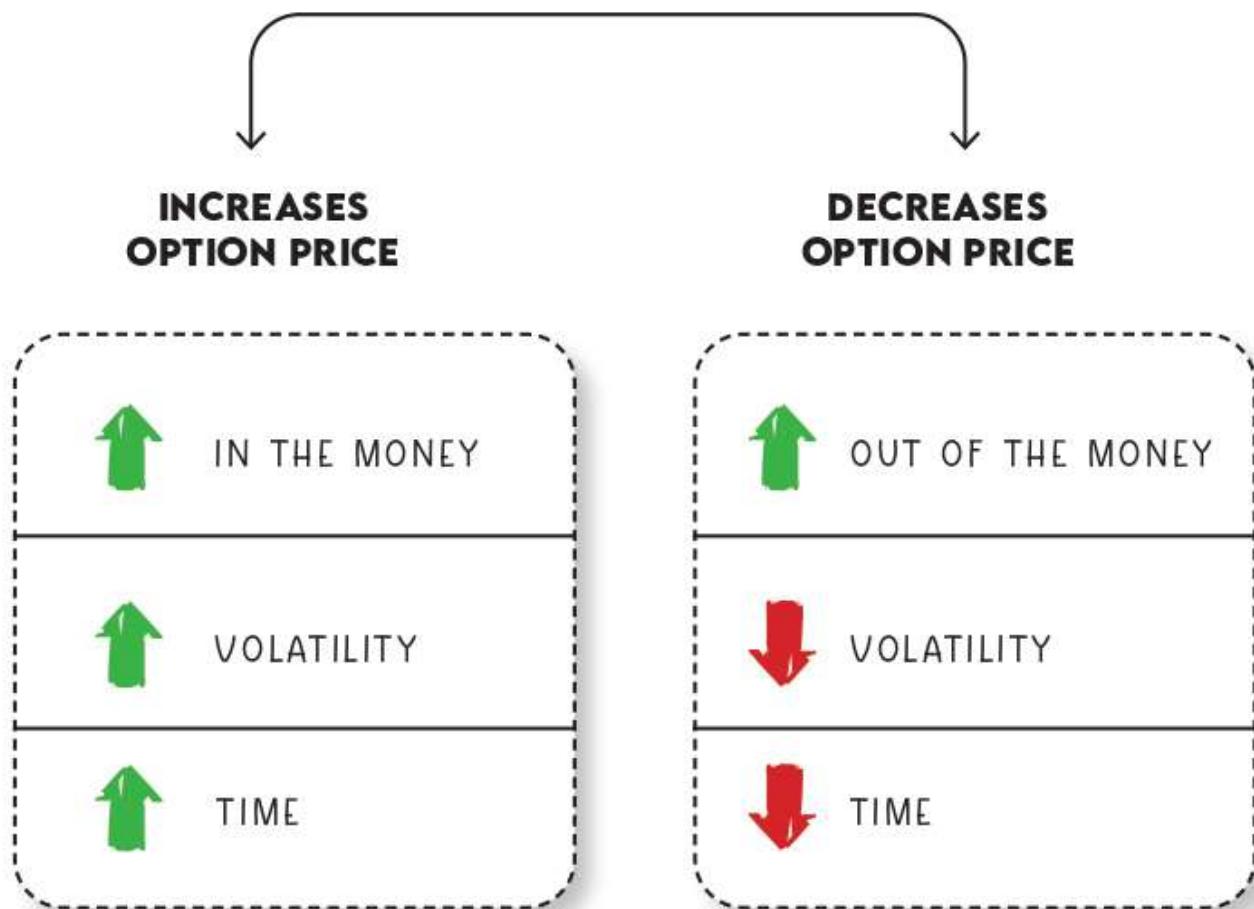
As the time to expiry of the option contract increases, the risk for the option seller also increases. It allows more time for the underlying asset and cause larger losses to the seller. As a result, as the risk increases so does the price or the premium of the option.



Similarly, as the time to expiry decreases, the seller is willing to sell at a lower rate. This is because the chances of them making a loss goes down. Also, the chances of the market price making a 250 points (say) movement in 3 days are relatively low in comparison to 3 weeks' time.



## **SUMMING UP THE FACTORS AFFECTING THE PRICE OF THE OPTION:**



Essentially, with an increase in risk for the seller, the premium increases and with a decrease in the risk, the premium decreases.

# 9.4 BLACK SCHOLES PRICING MODEL



Explainer Video

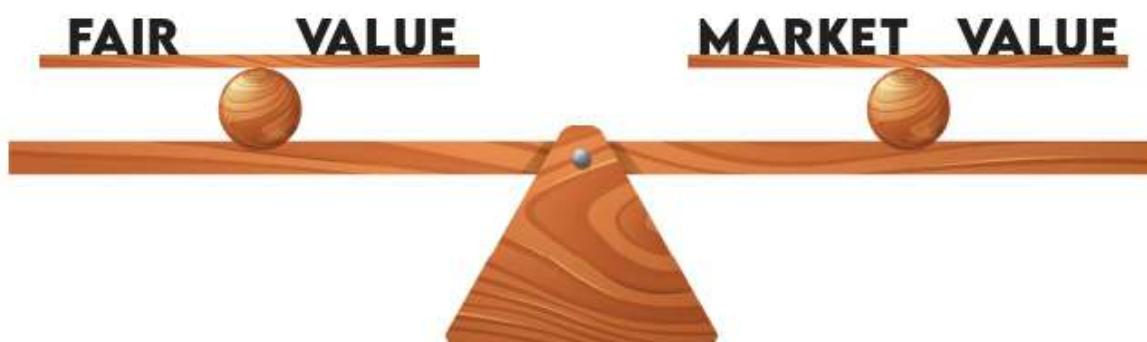


MR. FISCHER BLACK



MR. MYRON SAMUEL SCHOLES

They made this pricing model to determine the fair value or the theoretical value of options. Based on this fair value determined, we can compare it with the market value.



*This comparison helps in strategizing our trade or to find trading opportunities.*

$$C(S, t) = N(d_1)S - N(d_2)Ke^{-rT}$$

CALL OPTION  
PRICE

CUMULATIVE  
DISTRIBUTION  
FUNCTION

STOCK  
PRICE

STRIKE  
PRICE

$$d_1 = \frac{\ln\left(\frac{S}{K}\right) + \left(r + \frac{\sigma^2}{2}\right)T}{\sigma\sqrt{T}}$$

$$d_2 = d_1 - \sigma\sqrt{T}$$

$T$  ----- TIME LEFT TILL MATURITY (IN YEARS)

$r$  ----- RISK FREE RATE

$\sigma$  ----- VOLATILITY

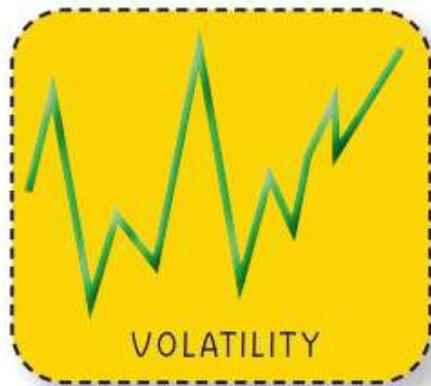
This model is based on 6 main variables that are used to establish the fair price of an option contract. It also has a formula which may be very intimidating at first, but we won't be using it as such. We will focus on the 6 variables that are used and understand the model through them. We will understand how each factor affects the pricing. Based on that we will understand what makes the price of an option contract move.

# 9.5 VARIABLES AFFECTING THE PRICING AS PER BLACK SCHOLES MODEL



Explainer Video

Black Scholes Model is a pricing method used to determine the fair value or theoretical value of the call or put option based on 6 variables:



VOLATILITY



TIME TO EXPIRY



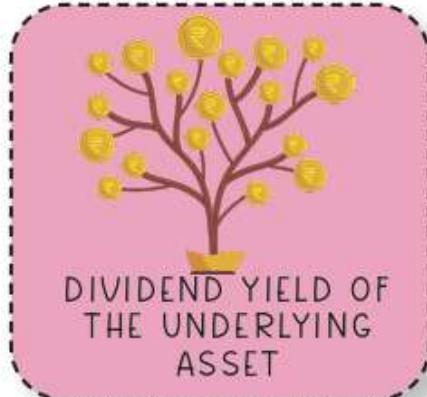
UNDERLYING STOCK PRICE



STRIKE PRICE



RISK FREE RATE OF RETURN

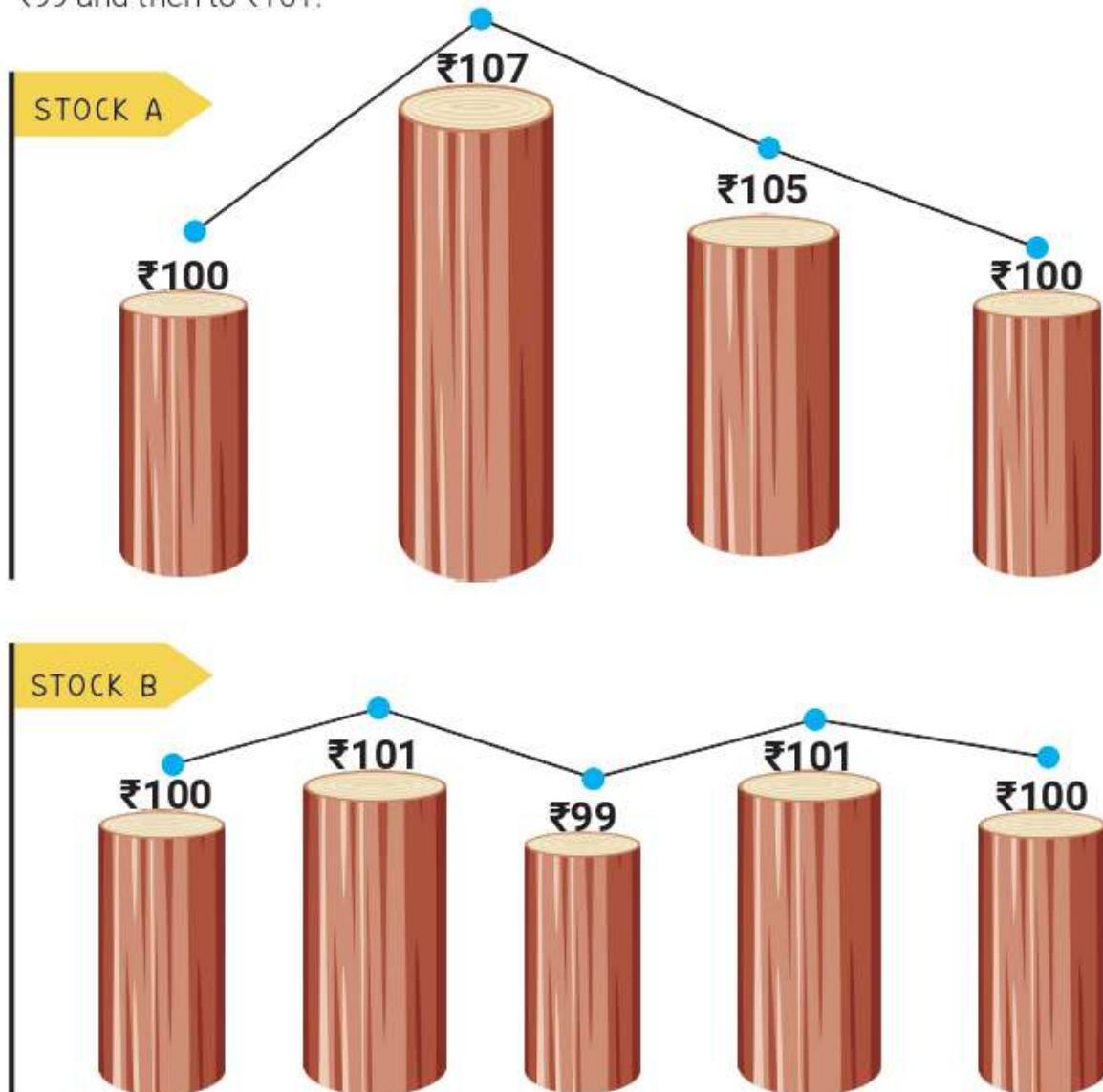


DIVIDEND YIELD OF THE UNDERLYING ASSET

## VOLATILITY

Here, we discuss the levels of current volatility and expected volatility in the market. Higher the volatility, higher will be the premium.

**For example,** assume that there are two stocks, one is moving from ₹100 to ₹105, then to ₹107 and then back at ₹100. The other is moving from ₹100 to ₹101, then to ₹99 and then to ₹101.



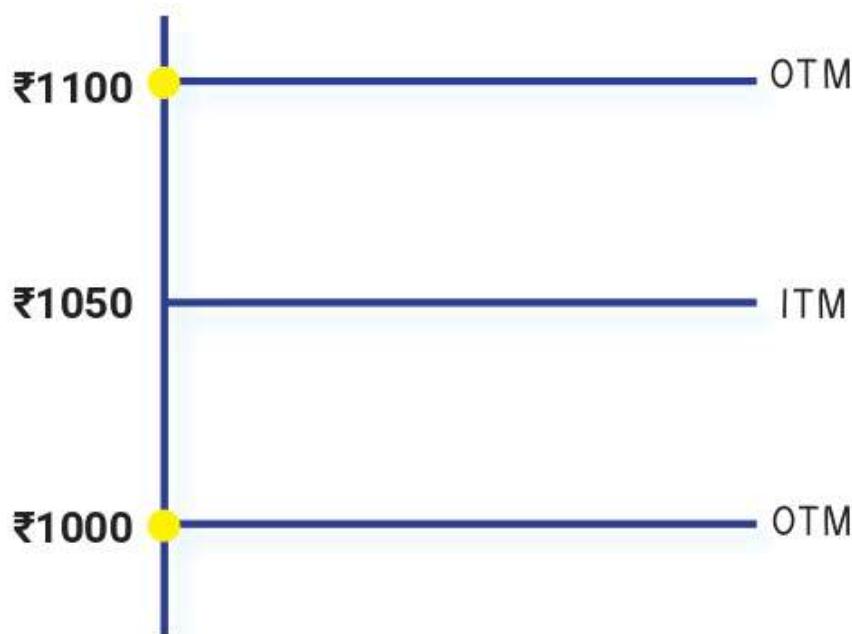
Which one of these has a greater risk based on price fluctuations? The first one, right? The risk is more because of bigger price movements. This goes to tell us that the first one is relatively more volatile, while the latter is less volatile.

**Volatility is generally caused by some external event like COVID, Russia-Ukraine war etc that creates panic in the market or by economic environment which may not be very bullish.** This increases uncertainty. With the increase in uncertainty, the risk for the seller of an option increases, and therefore, we have an increase in the premium. This is to ensure that the seller of the option is well incentivized to sell options even in turbulent times in the market.

## UNDERLYING STOCK PRICE

As the price of the underlying asset changes, the in-built profits of the options contract change as well. This also changes the moneyness of the option contract. The movement in the stock price with respect to the strike price can change an out-of-the-money option to in-the-money.

*For example,*



Lets say the strike price of the underlying asset is ₹1050 currently. So, we can say that the call option contract with the same Strike Price is at the money and the Strike Price of 1000 is in the money and the one at ₹1100 is out of money.  
But as the price of the underlying increases to ₹1100, the option at ₹1050 as strike price increases in value as it adds in-built profits into it. At the same time, if the price reduces from ₹1050 to ₹1000, the value for all the call options will decline.

*For Call option,*



*For Put option,*



## TIME TO EXPIRY

How much time is left in expiry again affects the risk or uncertainty for the seller. The price of a stock may not move 100 points (say) in a day but the chances of it moving those many points in a month are much higher.

Therefore, the risk in an option expiring in a month is greater than the risk in an option expiring in a day or week.

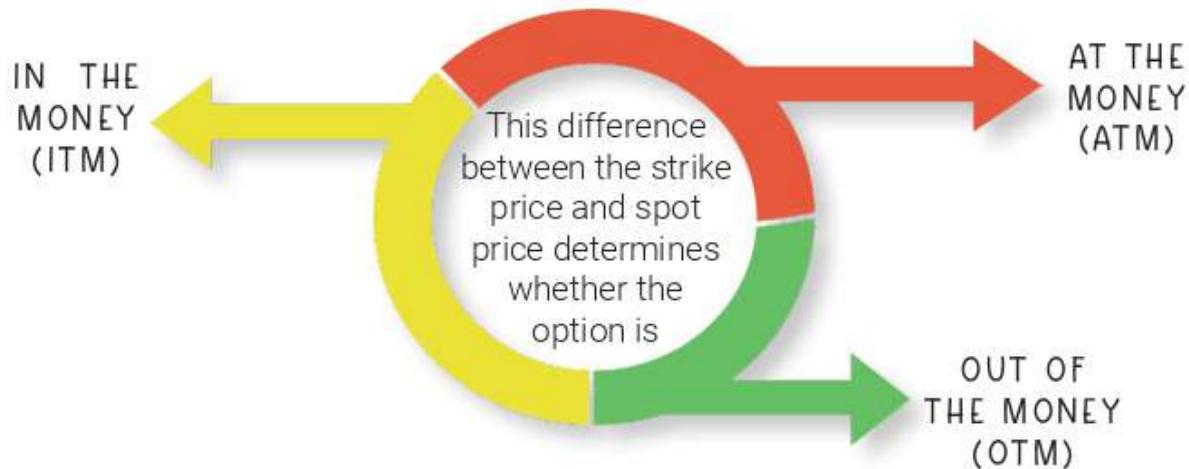


The profits of the seller are limited to the premium amount. As the possibility of loss increases due to uncertainty, the seller would higher reward for the higher risk taken. The premium hence will increase with an increase in time to expiry for both call and put.



## STRIKE PRICE

The strike price affects the in-built profit value of the option with respect to the spot price of the stock. Based on the moneyness of the option then the price of the option is affected.



### ***For Call Options,***

Lower the Strike Price, higher will be the premium.

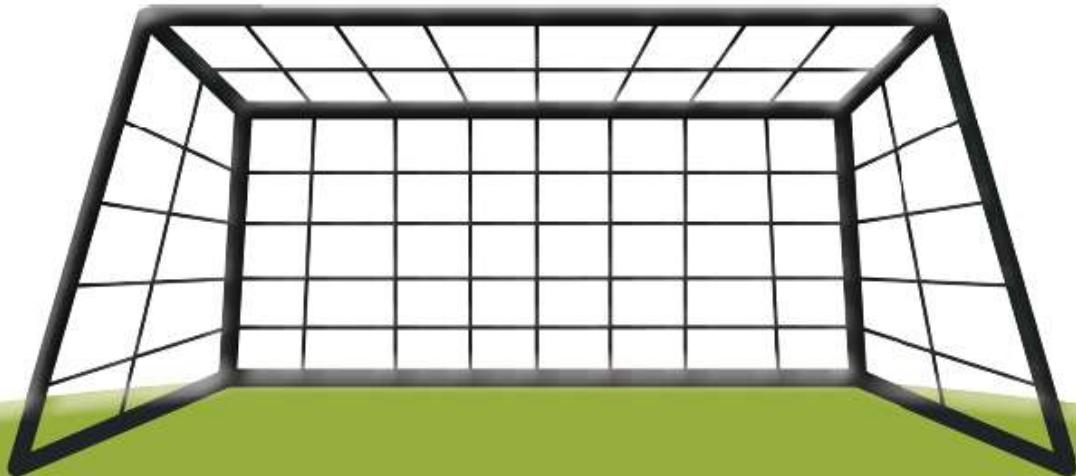
### ***For Put Options,***

Higher the Strike price, Higher will be the premium.

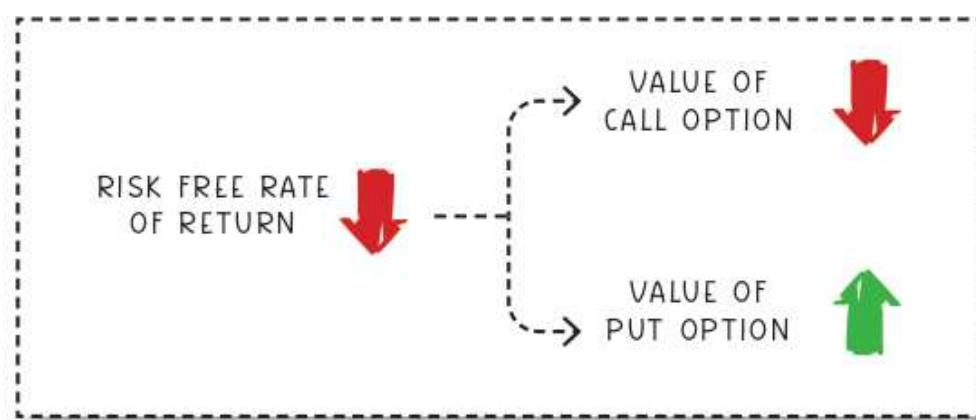
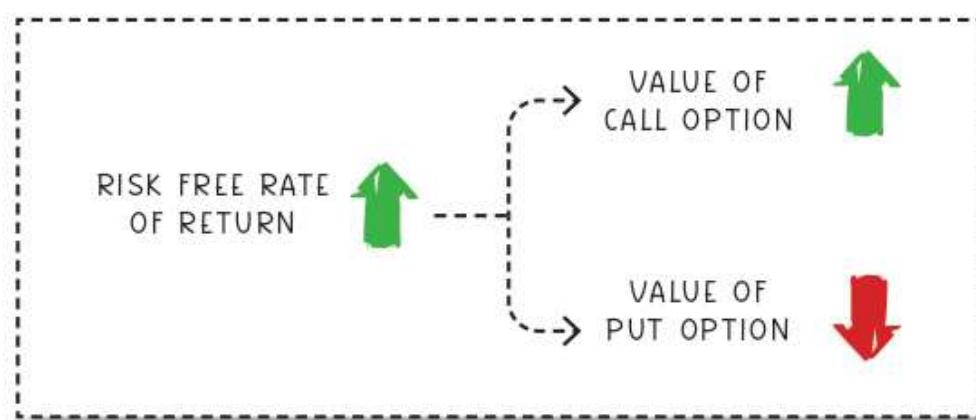
## RISK-FREE RATE OF RETURN

The government bond return is considered to be risk free rate of return. This is because within an economy, the government has the right to print more money and they can always repay liability by printing more money.

RISK FREE RETURN



The impact of the risk-free rate of return is that as the risk-free rate increases, the value of call option increases and value of put option decreases. At the same time, if the risk free rate decreases, the value of call decreases and the value of put increases. The reason for this to happen is that as the risk free rate increases in the economy, the overall interest rates in the economy also increases. When this happens, the expected returns from most asset classes go up. Since, asset prices are likely to go up, Call Options become relatively more expensive and Put options become less valuable.



So, as the stock price is expected to rise at a higher pace than risk-free rate, the options price is affected.

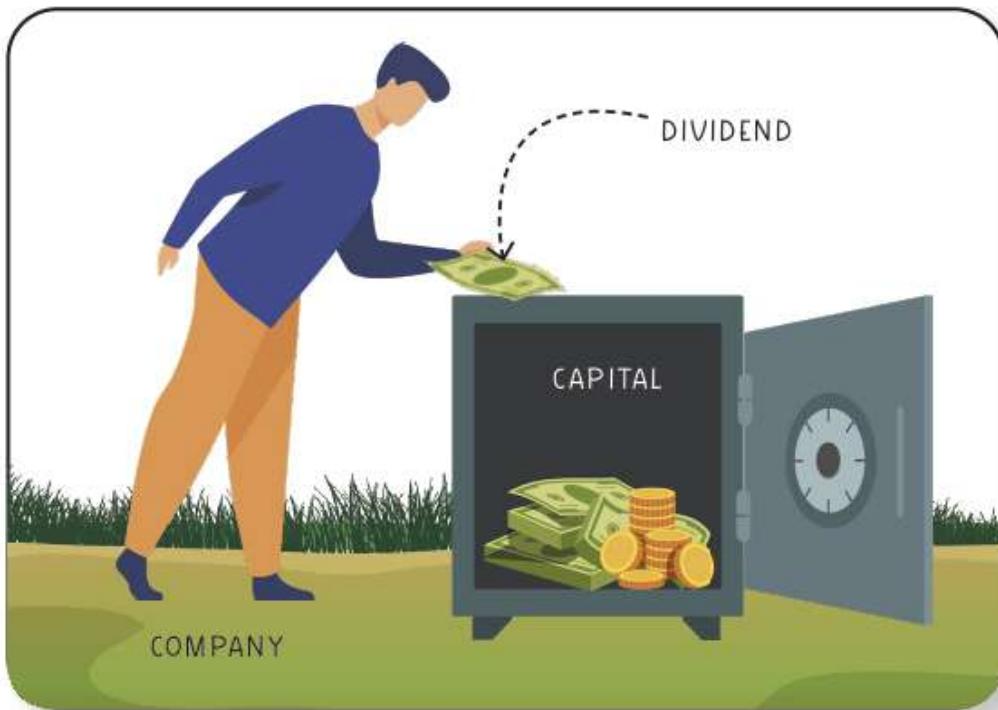
The Seller will only take on the risk despite increased likelihood of the share prices increasing, if they receive a higher premium for the same.

We can look at the Market Return as this,

$$\text{MARKET RETURN} = \text{RISK FREE RATE} + \text{RISK PREMIUM}$$

## DIVIDEND YIELD

Dividend Yield refers to the amount of dividend that a company pays to its shareholders. As a company does this, the price of the stock in the market would go down.



So, **for example**, if a stock was priced at ₹200 and the company decides to give ₹10 as dividend. The dividend distribution would bring the price of the stock down to ₹190 or ₹185. (This is just a hypothetical situation.)

Companies with high dividend yield have lower capital appreciation. As a result, as dividend yield increases, call options become less valuable and put options become more valuable.



Similarly, with lower dividend yield, the capital appreciation is higher. As Dividend Yield decreases, the value of call option increases and value of put option decreases.



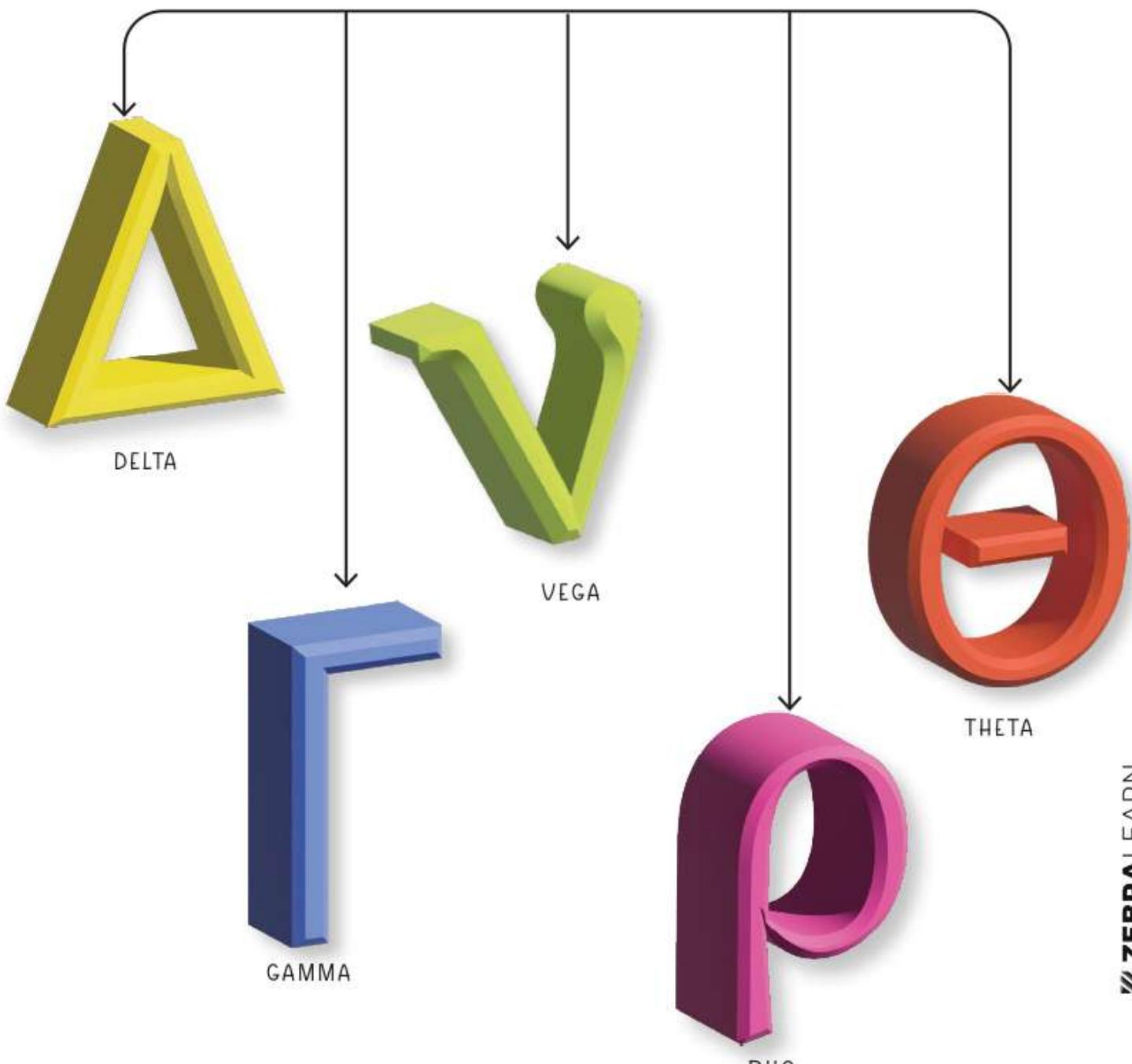
As of now these factors may seem confusing, but as you spend time with options, you will get more and more comfortable with the same. Understanding of these factors is important to understand how prices of different option contracts move and how all of them come together in different trading strategies that we will form. With this we conclude our discussion of factors that affect Black-Scholes option pricing model. We do not really need to understand the calculation but we do need to understand these factors that affect the calculation.

# 9.6 WHAT ARE OPTION GREEKS?



Explainer Video

Option Greeks refer to different financial measures that help us understand the sensitivity of an option contract in relation to the factors that affect the option pricing. For instance, it shows how sensitive is option's price to time to expiry, how sensitive is option's price to volatility in the market and so on. Different Greeks are used - Delta, Vega, Gamma, Rho and Theta. Do not stress about using them from day 1. Make sure you understand these well. But only with time in the market will you get comfortable with trading based on Option Greeks. Lets understand each one that we have mentioned.



## DELTA



Delta talks about how much the price of the options changes with a change in the price of the underlying asset.

**For example,** if the price of the underlying changes by 1%, and the option price changes by 20% then we can say that the delta for this option contract is 20.

$$\text{DELTA} = \frac{\% \text{ CHANGE IN OPTION}}{\% \text{ CHANGE IN PRICE OF UNDERLYING ASSET}}$$

Gamma is simply the change in Delta with respect to the change in underlying asset price. Here we intend to understand, how quickly option's sensitivity to underlying price changes.

$$\text{GAMMA} = \frac{\% \text{ CHANGE IN DELTA}}{\% \text{ CHANGE IN PRICE OF UNDERLYING ASSET}}$$

## GAMMA



## VEGA



Vega tells us about how much the option price changes with a change in the volatility of the underlying asset.

$$\text{VEGA} = \frac{\% \text{ CHANGE IN OPTION}}{\% \text{ CHANGE IN VOLATILITY}}$$

Rho tells us about how much the option price changes with a change in the risk-free rate of return.

$$\text{RHO} = \frac{\% \text{ CHANGE IN OPTION}}{\% \text{ CHANGE IN RISK FREE RATE OF RETURN}}$$

## RHO



## THETA



Theta tells us about how much the option price changes with a change in the time to expiry of the contract.

Option Greeks are commonly used tools by traders who trade in Options. It tells them how sensitive is an option to different factors that affect the option's price. Again, do not stress about using them from day 1. Just spend time and get comfortable with them first.

Understanding option pricing and how different factors affect this pricing is fundamentally important to understand before we move ahead with option strategies. Try spending as much time as possible on different option chains on the NSE website. Calculate Option Greeks for different options. Look for reasons behind difference in prices of different option contracts.

With this, we conclude our discussion on option pricing and the different factors that affect the price of any given option contract. Remember, practice is the key. More time you spend on the Option chain, more comfortable will you get with these factors. Now, in the next chapter, we move ahead with different option strategies. Lets get started with them.



## CHAPTER 10

# OPTION STRATEGIES

- 10.1 Introduction**
- 10.2 Protective Put Strategy**
- 10.3 Synthetic Put Strategy**
- 10.4 Covered Call Strategy**
- 10.5 Straddle Option Strategy**
- 10.6 Payoff Charts for Long Straddle**
- 10.7 Payoff Charts for short Straddle**
- 10.8 Collar Option Strategy**

## 10.1 INTRODUCTION

Now that we are thorough with the basics of options, it's time we apply the knowledge and learn about option strategies. We will be learning about how to make our own strategies as well. This is about to get really exciting.

Before we learn about the methods for creating our own strategies, let's first look at some commonly used strategies. Understanding these would create a base for us as we move ahead with creating our own strategies.



While making strategies, we will be combining different options, futures and cash positions. We may be short on 2 options, long on 1 and even selling a stock or buying one. All of it happening simultaneously in a strategic way would together become our trading strategy with derivatives. It is important that we make this as practice-driven as possible. More you practice, better will be your understanding.

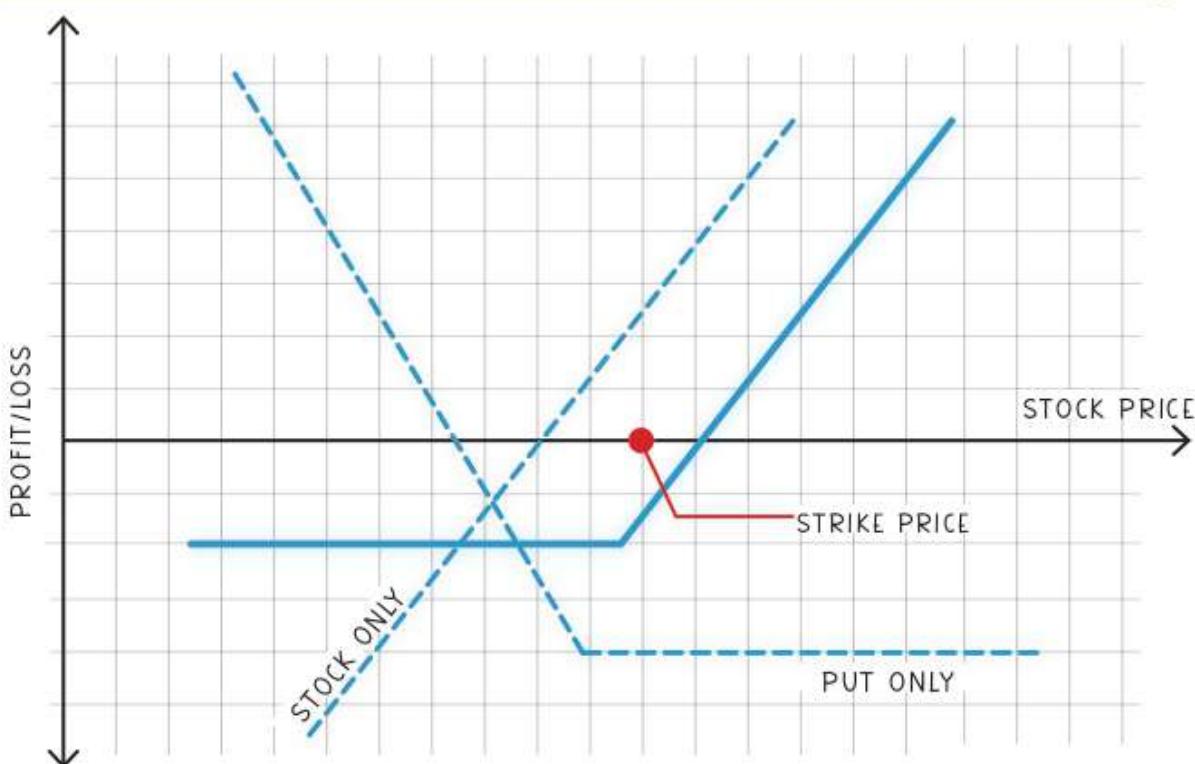
## 10.2 PROTECTIVE PUT STRATEGY



Explainer Video

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PROTECTIVE PUT STRATEGY IS A RISK MANAGEMENT STRATEGY THAT USES A PUT OPTION TO INSURE A POSITION IN ANY STOCK OR INDEX. IT LIMITS THE DOWNSIDE THAT A POSITION MAY HAVE WHILE KEEPING THE UPSIDE INTACT. HOWEVER, PROTECTIVE PUT COMES AT A COST I.E. PREMIUM.



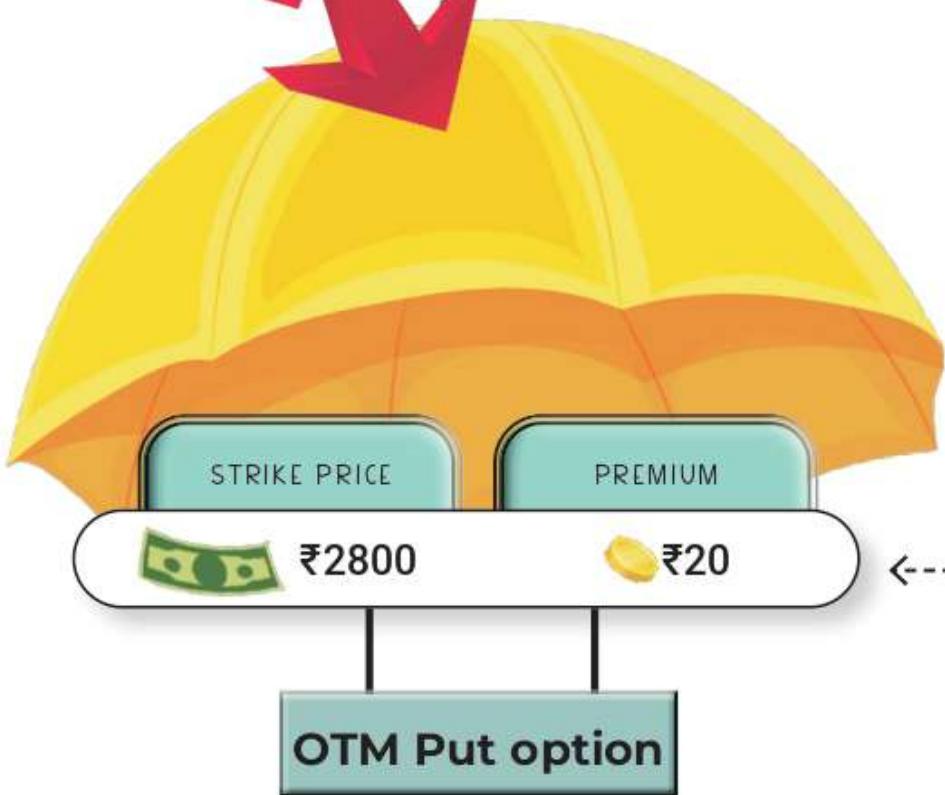
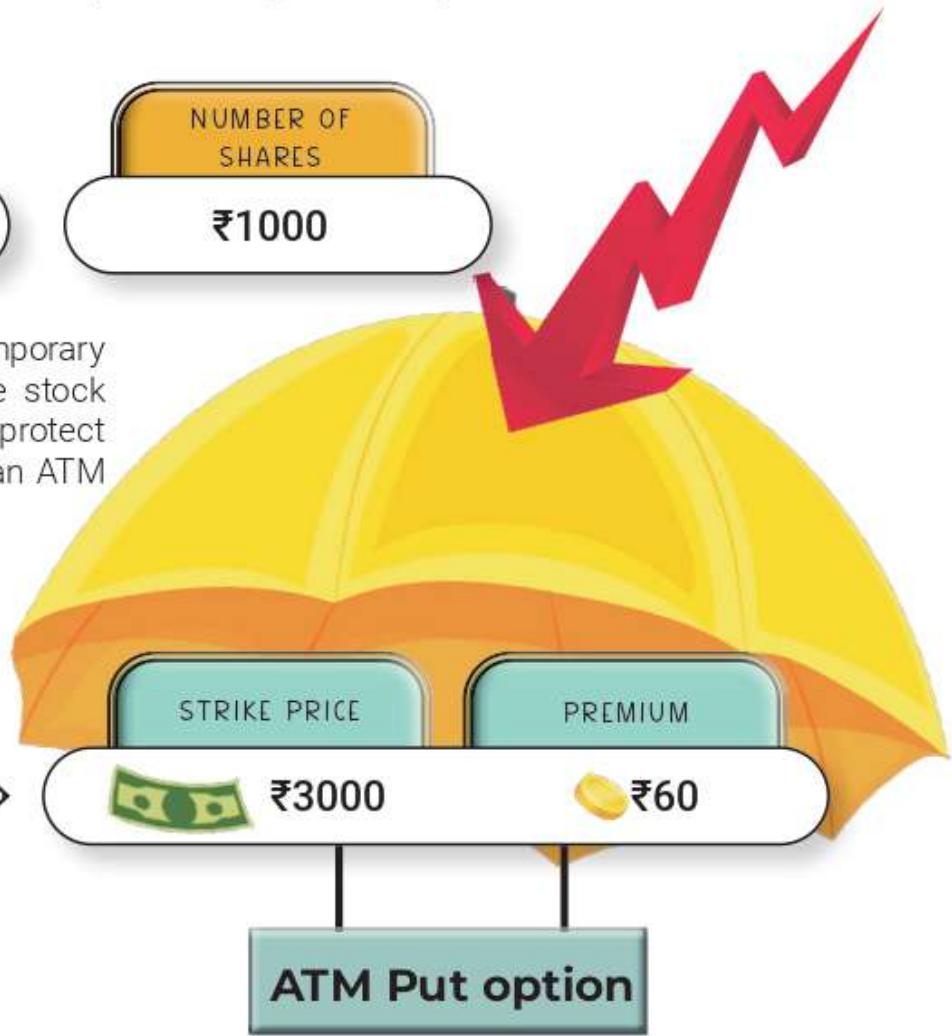
The protective put strategy is also called ***Married put or Synthetic call***. The name synthetic call is used for this type of strategy because it behaves like a call option only, but since it is not a straightforward call but a combination of assets that have risk-reward like a call would, it is called a synthetic call.



Let's understand what a protective put is through an example.  
Suppose we own shares at

CURRENT  
MARKET PRICE  
₹3000

NUMBER OF  
SHARES  
₹1000



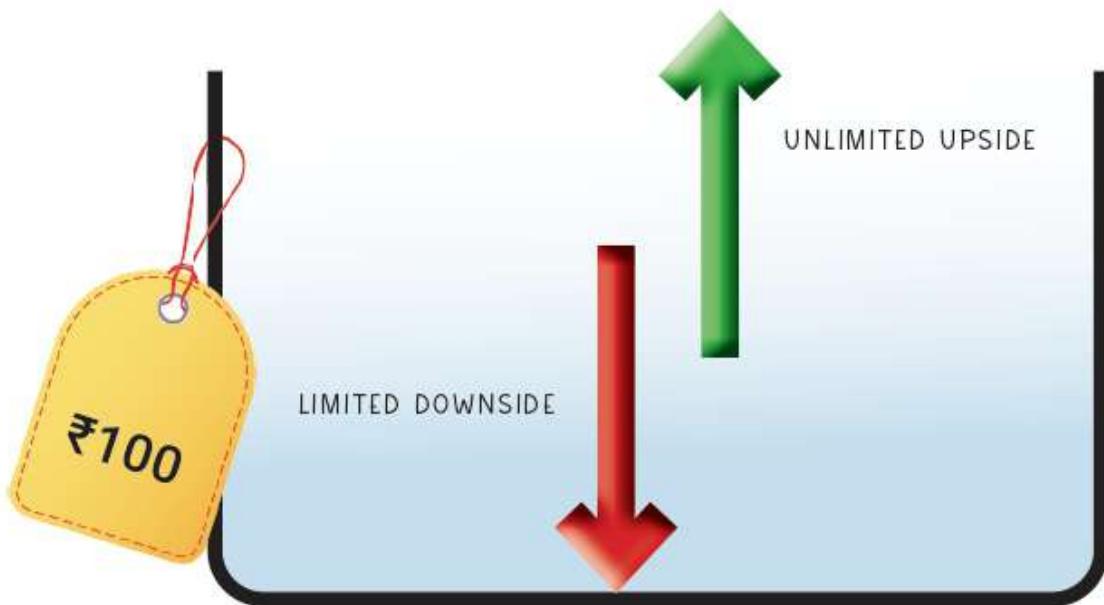
Let's say we buy the ATM put. Then, the premium amount (₹60) is the cost of protective put that we will be paying.  
Assuming,

MARKET PRICE ON EXPIRY	NET PROFIT/ LOSS	EXPLANATION
₹2900	<b>Profit/Loss</b> = Profit/Loss on Shares + Profit / Loss on Option $= (2900-3000) + (3000-2900-60)$ $= -₹100 + ₹40$ $= ₹60$	So, we can see that despite the stock price going down by ₹100, our losses are only at ₹60. This is where Protective Put protects us from the downside.
₹3200	<b>Net Profit</b> = ₹3200 – ₹3000 – ₹60 $= ₹140$	We see that when the price did not actually go down, we enjoy the upside of stock position. However, ₹60 paid as premiums will reduce our profitability. This is the cost of Protective Puts that we have to incur.
₹2000	<b>Profit/Loss</b> = Profit/Loss on Shares + Profit / Loss on Option $= (2000-3000) + (3000-2000-60)$ $= -₹1000 + ₹940$ $= ₹60$	We can see that despite the stock price going down by 33%, our losses were still capped at ₹60.

By applying this strategy, we have in a way insured ourselves from the expected loss for a specific period of time. We can again and again enter into such protective put strategy whenever we have reasonable belief that the stock may go down. However, this is a very expensive protection and it eats into our investment results. So, if we have protective put very frequently, it will generate below-par results on the entire position. It is only to be used when there is significant reason to be bearish.

Large companies and banks generally have large blocks of shares of single company.

In case of expected turbulence in the market, it is not possible to sell so many shares at once. In such a scenario, the protective put strategy comes in handy to insure the shareholder against any downside while enjoying the profits. And if the price of the share does not fall, the premium will be the limited loss for the shareholder.



Essentially, the downside stays limited. The upside potential stays unlimited. And the cost is the premium paid. These features are like that of a call option and therefore, the name synthetic call. This protects our long-term portfolio. We can use it for trading purposes as well.

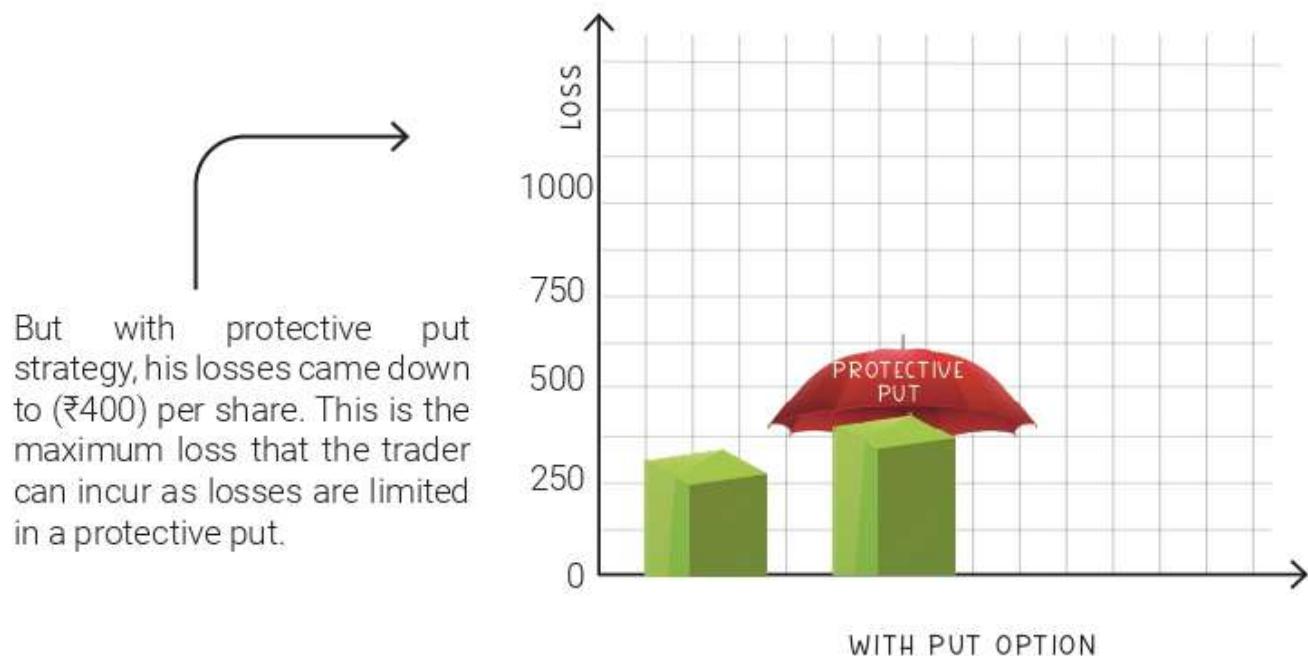
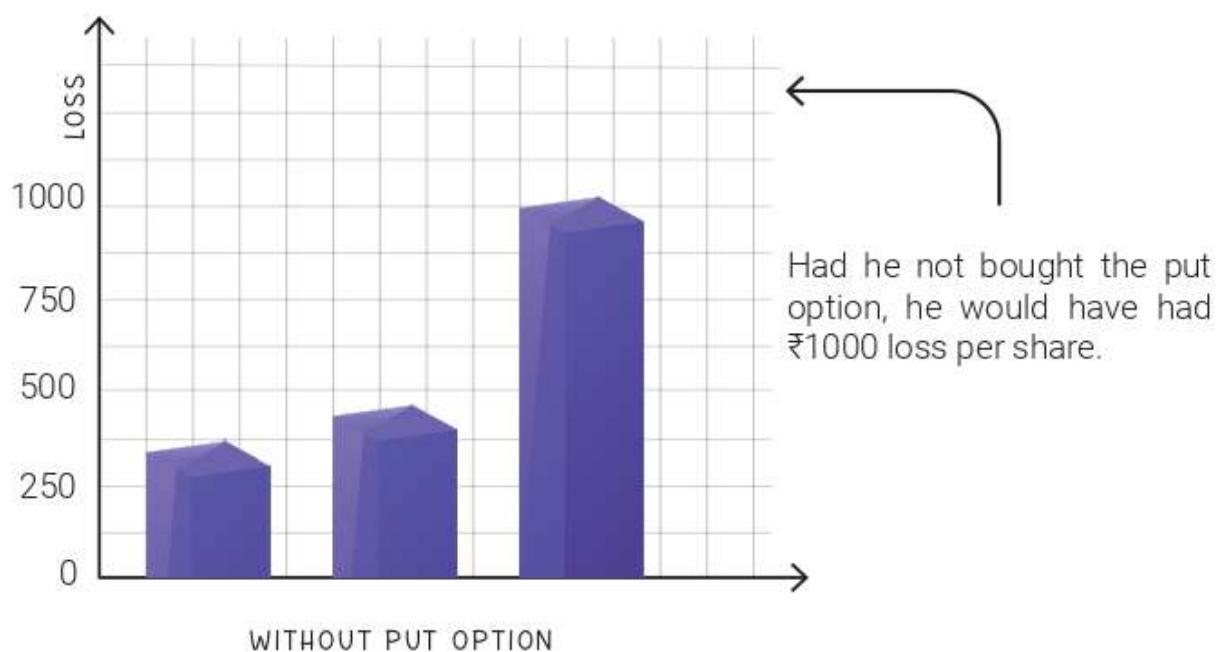


Let us look at another example here,  
A man buys 100 shares of Asian Paints at ₹3000 with the expectation  
that the price will increase. Therefore, he hedges his position by  
buying a put option at



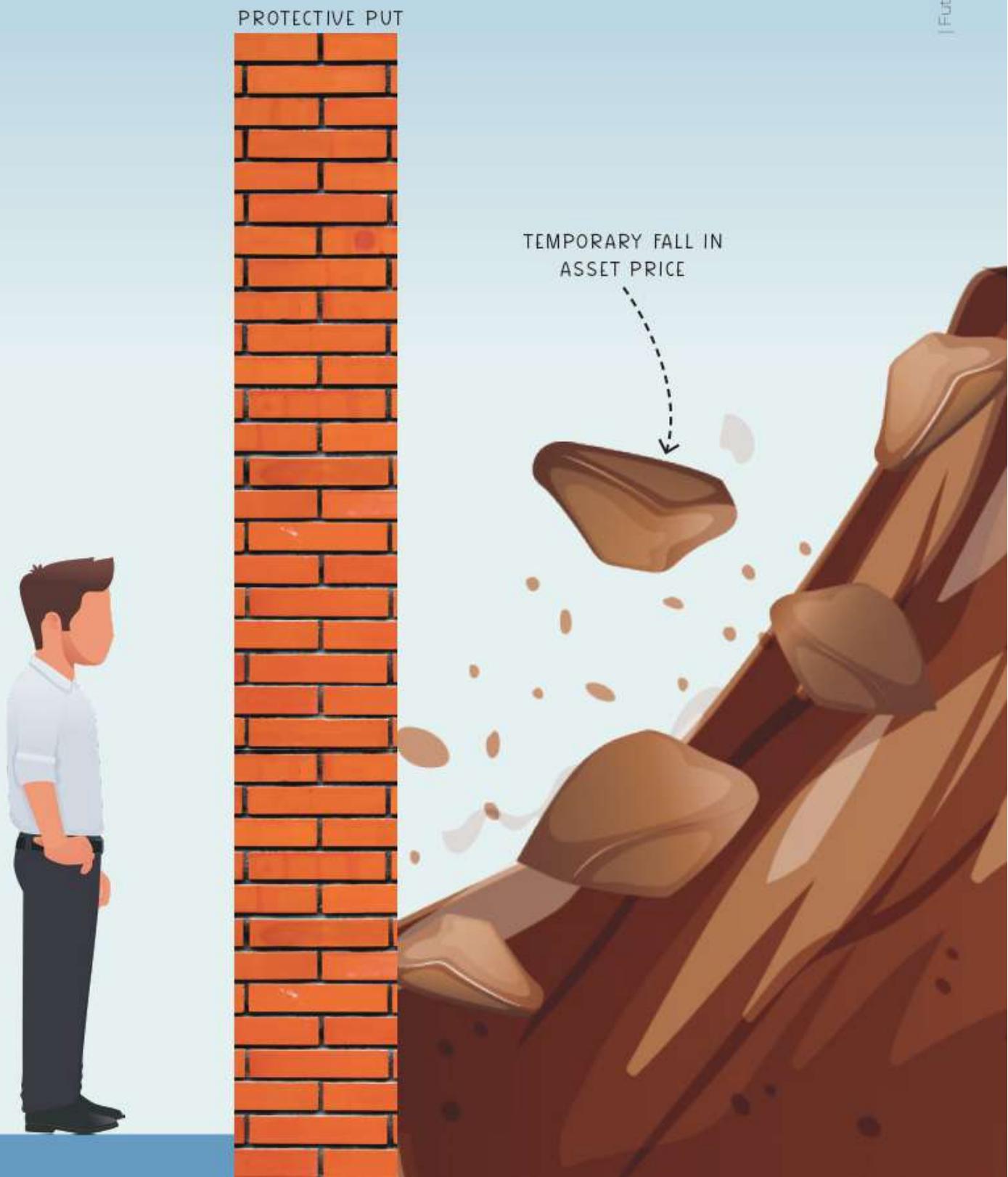
Let's assume 2 scenarios,

CURRENT MARKET PRICE (CMP)	NET PROFIT/ LOSS	EXPLANATION
₹4000	$\text{Net Profit} = ₹4000 - ₹3000 - ₹150$ $= ₹850$	Since, the price rises by ₹1000, the Net profit is ₹850 per share.
₹2000	$\text{Profit} = \text{Strike} - \text{CMP} - \text{Premium}$ $= ₹2750 - ₹2000 - ₹150$ $= ₹600$ $\text{Net Loss} = ₹3000 - ₹2000 - ₹600$ $= ₹400$	Since, the price has declined, the put option will protect from losses. The net loss is capped at ₹400 per unit here.



A protective put strategy might look very appealing in the sense that you will always be protected. However, this strategy is **very costly** and therefore, it can be looked at as a temporary hedge only. The monthly cost of this strategy can lower the overall profits significantly. Having a put option at all times for your position will make the position loss-making rather profitable.

One must use protective put only when there is a large position and you want to insure yourself against a temporary fall in the asset price. From a trading point of view, use the same when you expect the asset price to go up but want to protect the downside as well.



## 10.3 SYNTHETIC PUT STRATEGY



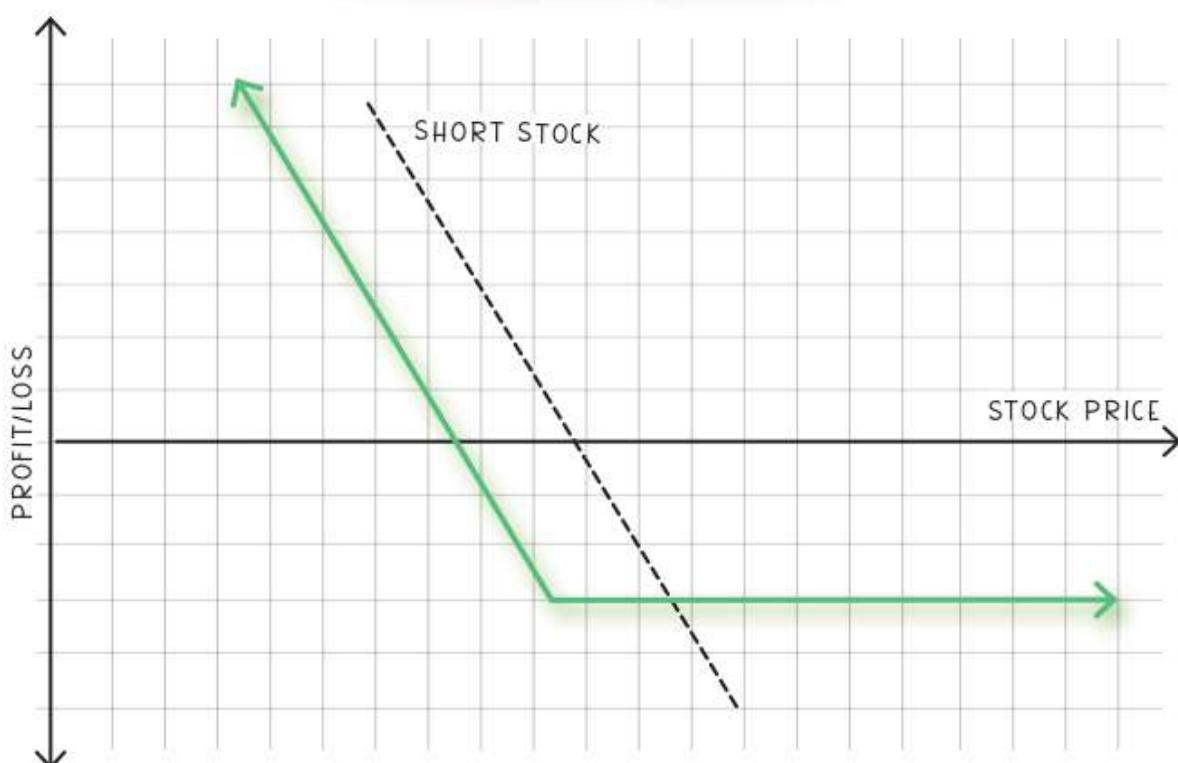
Explainer Video

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SYNTHETIC PUT STRATEGY IS A RISK MANAGEMENT STRATEGY THAT USES CALL OPTION TO INSURE SHORT POSITION IN ANY STOCK OR INDEX.

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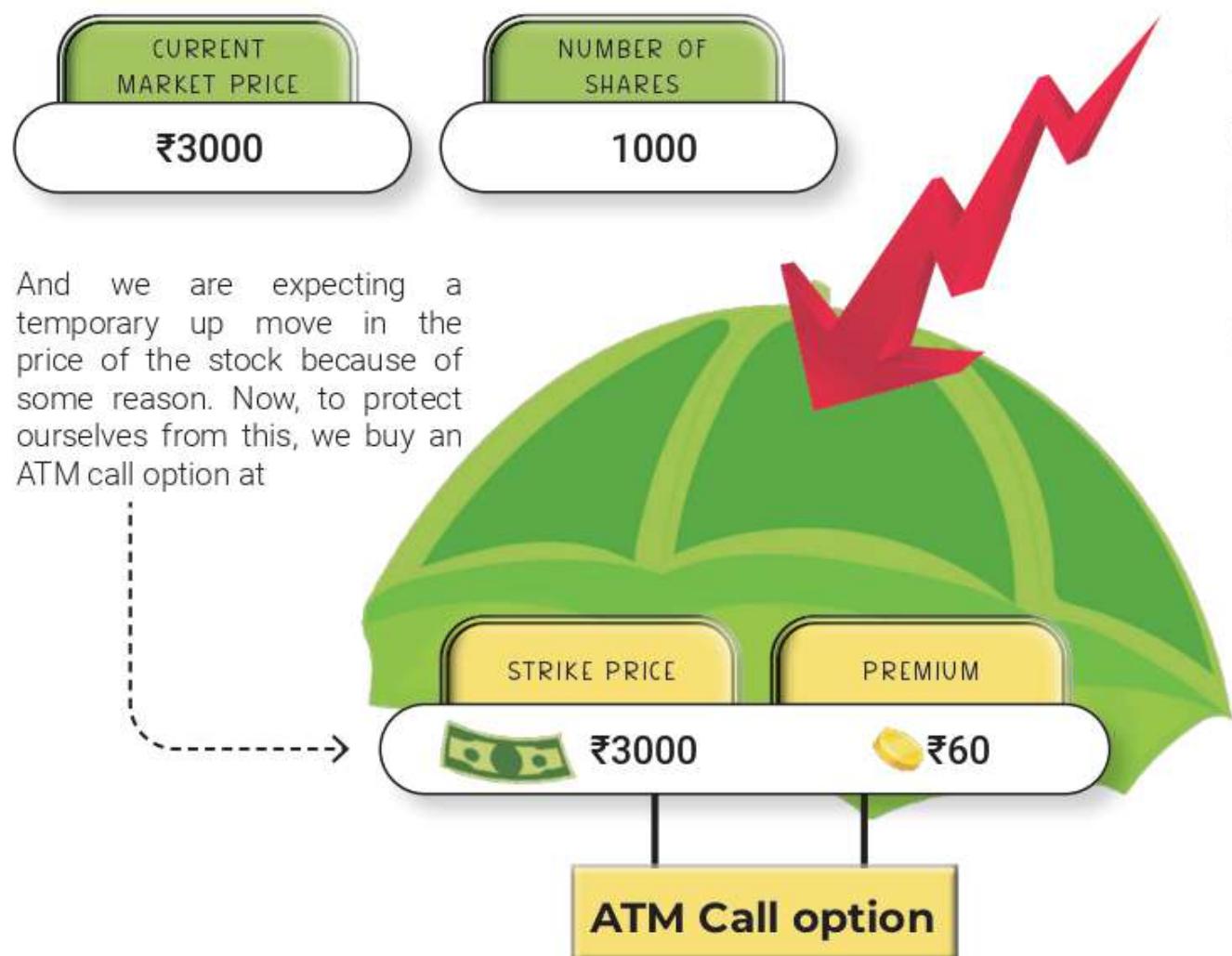
IT WOULD LIMIT YOUR RISK OF INCURRING LOSSES FROM UPSIDE MOVEMENT AND PROVIDE YOU WITH UNLIMITED PROFITS FROM THE DOWNWARD MOVEMENT OF THE ASSET PRICE.



This strategy is exactly the opposite of Protective Put or Synthetic Call that we were discussing in the previous part. The name Synthetic Put again comes from the fact that this strategy also resembles a Simple Put option in terms of risk and reward potential.

The purpose of a synthetic put strategy is similar to a synthetic call strategy. The only difference is that here we are protecting ourselves from upside movement because we are short on the asset. Therefore, we are buying a call option in this strategy.

**For example,** suppose we are short on shares at (In India, you can not short shares which you can do in many developed markets, but you can short in Futures market) :



**MARKET PRICE ON EXPIRY**

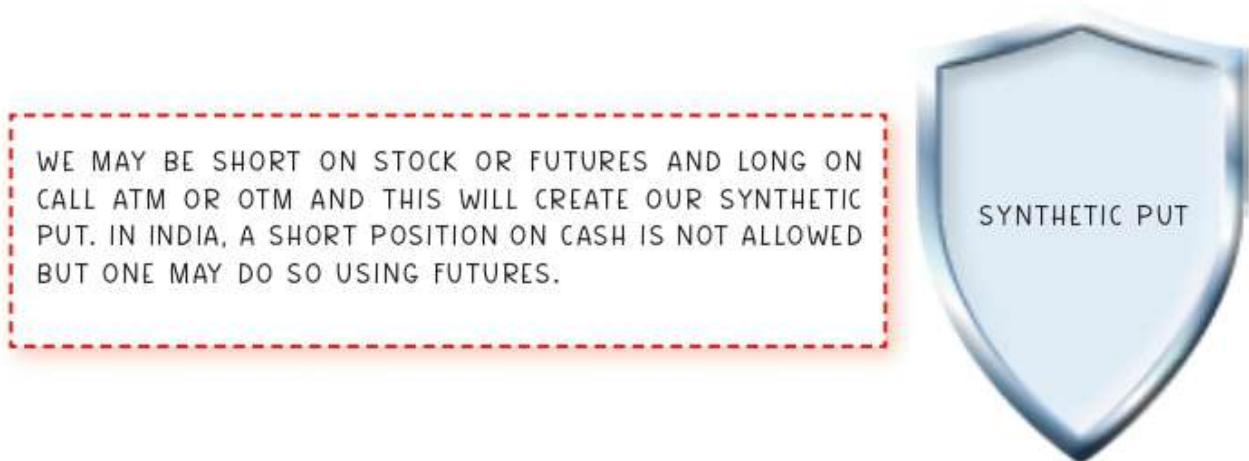
₹3500

**CALCULATION**

$$\begin{aligned}
 \text{PROFIT/ LOSS} &= \text{Profit/Loss from Short Selling} \\
 &\quad + \text{Profit/Loss from options} \\
 &= (\text{₹3000} - \text{₹3500}) + (\text{₹3500} - \text{₹3000} - \text{₹60}) \\
 &= -\text{₹500} + \text{₹440} \\
 &= \boxed{-\text{₹60}} \text{ MAXIMUM LOSS}
 \end{aligned}$$

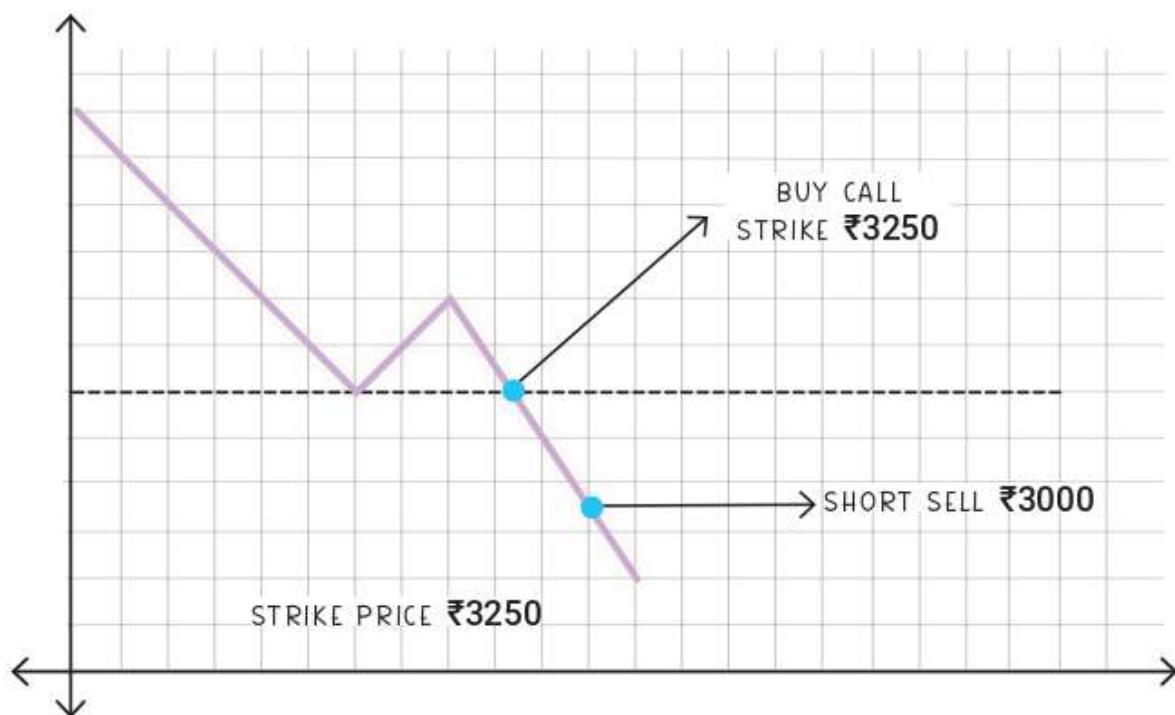
So, we can see that our net loss should have been ₹500 but due to the limited loss nature of the agreement, the total loss was limited to ₹60 which is the maximum loss.

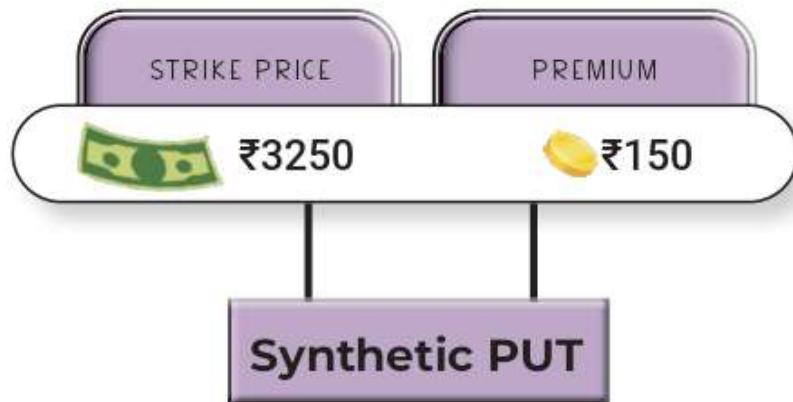
By applying this strategy, we have in a way insured ourselves from the expected loss for a specific period of time. We may protect ourselves again by entering this synthetic put as needed. Essentially, limited losses with call. The profit potential remains unlimited whereas the losses are limited to the premium amount paid.



Let us discuss another example of synthetic put.

A man sells 100 shares of Asian Paints at ₹3000 with the expectation that the price will decrease. Therefore, he hedges his position by buying a call option at a premium of ₹150 per share at a strike price of ₹3250 (say).





Assuming,

MARKET PRICE ON EXPIRY	NET PROFIT/ LOSS	EXPLANATION
₹3500	<p><b>Profit/Loss</b></p> <p>= Profit/Loss from ShortSell + Profit/Loss from Call Option  <math>= (\text{₹}3000 - \text{₹}3500) + (\text{₹}3500 - \text{₹}3250 - \text{₹}150)</math>  <math>= -\text{₹}500 + \text{₹}100</math>  <b>= ₹-400</b> <small>MAXIMUM LOSS</small></p> <p>The Maximum Loss is limited to ₹400.</p>	We can see that the price rises by ₹500. The loss for the trader should have been ₹500 but due to the synthetic put, the losses were limited. The losses here were limited to ₹400 as the options bought were out of money. This is what Protective Put does, it limits the losses for the trader.
₹2000	<p><b>Profit/Loss</b></p> <p>= Profit/Loss from ShortSell + Profit/Loss from Call Option  <math>= (\text{₹}3000 - \text{₹}2000) + (-\text{₹}150)</math>  <math>= \text{₹}1000 - \text{₹}150</math>  <b>= ₹850</b></p>	Here, we can see that the trader would have made a profit of ₹1000. But due to the cost of Synthetic Put, the profit got reduced by ₹150 i.e. premium paid. Total Profit for the trader = ₹850.

## 10.4 COVERED CALL STRATEGY

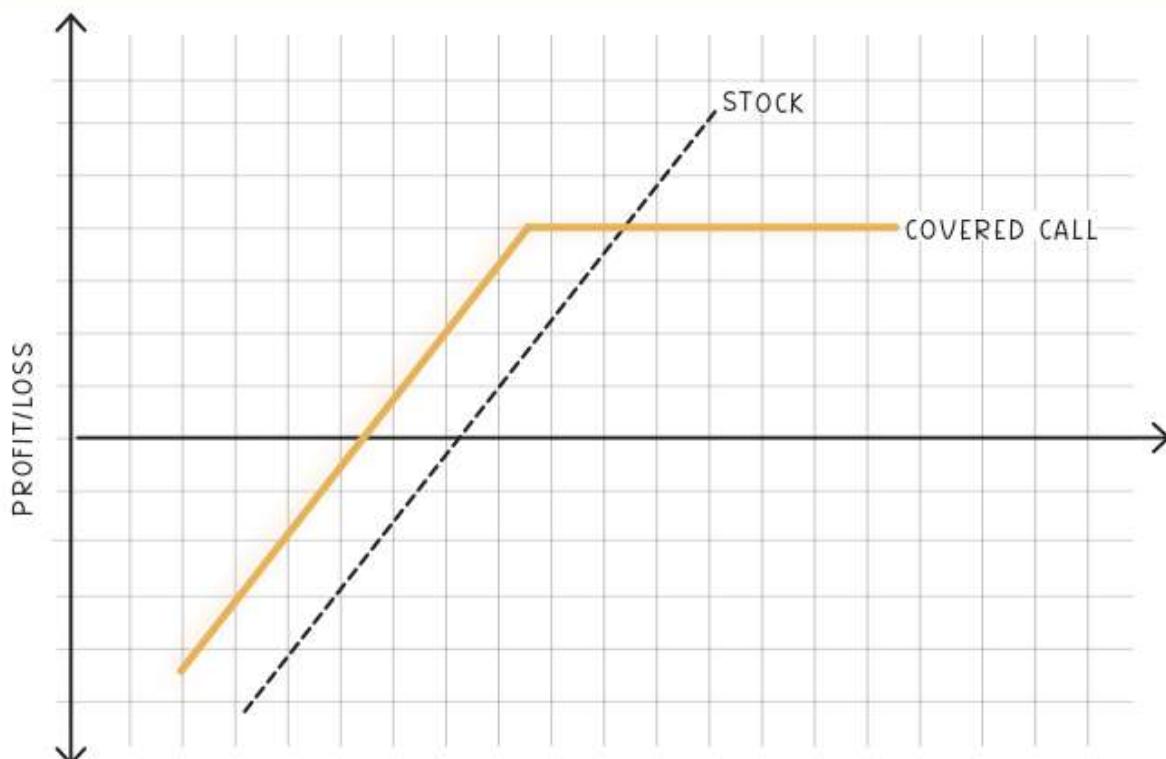


Explainer Video

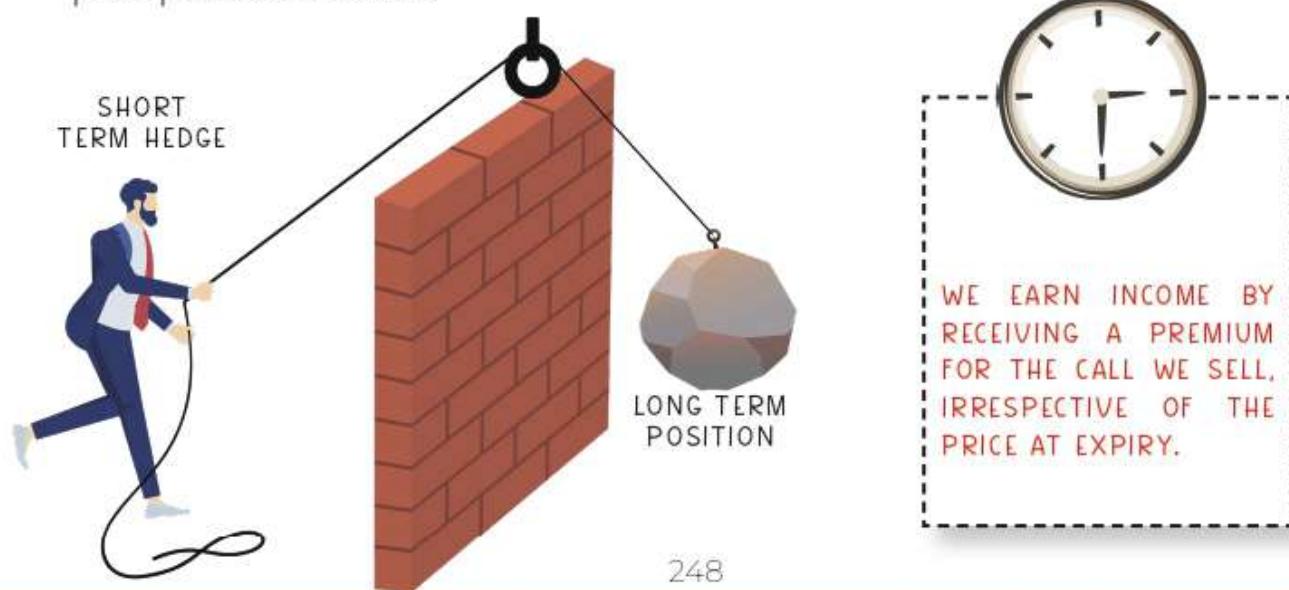
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A COVERED CALL IS A TRADING STRATEGY WHERE A LONG POSITION IS TAKEN IN CASH OR FUTURES MARKET AND ITS UPSIDE IS LIMITED BY SELLING SAME AMOUNT OF CALL OPTIONS TO BENEFIT FROM THE PREMIUM.

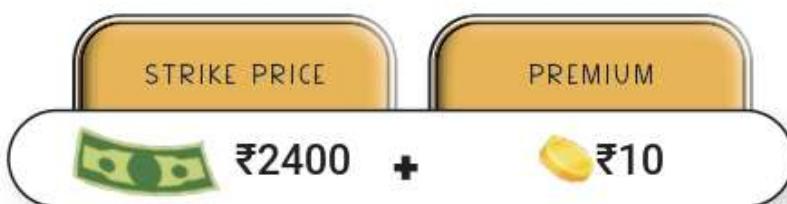
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When one expects the markets in general to fall and they have a large chunk of shares, they can sell call options to collect the premium and compensate for the losses that they would incur if the stock falls down. However, here the losses are not limited. The profit potential is limited.



**Suppose** we have a stock at ₹2000 and we expect the market to go down temporarily. What we can do is, we can sell a call at:



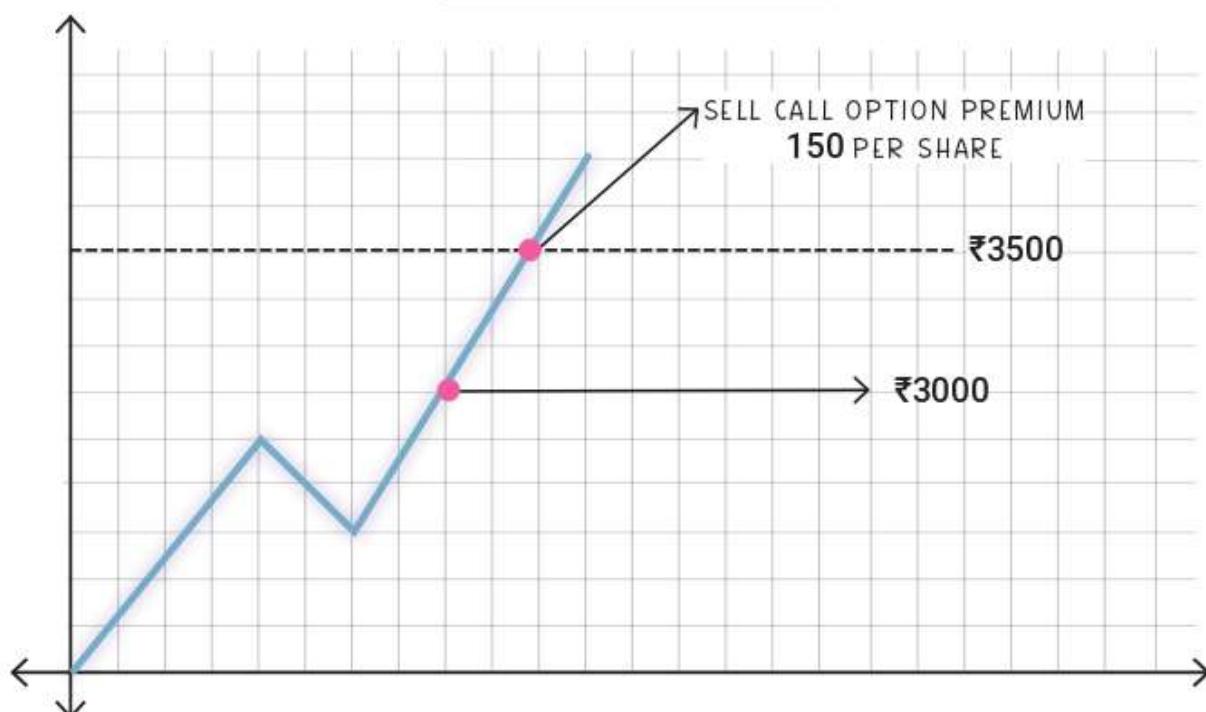
Now, as the share price goes down our losses will be reduced by this ₹10.

Let's say

MARKET PRICE ON EXPIRY	NET PROFIT/ LOSS	EXPLANATION
₹2300	<b>Profit/Loss</b> $= \text{Profit/Loss on CashPosition} + \text{Profit/Loss on Selling Call Options}$ $= (\text{₹2300} - \text{₹2000}) + (\text{₹10})$ $= ₹300 + ₹10$ $= ₹310$	We would make a profit of ₹300 from each unit of share due to capital appreciation. Also, we have received additional ₹10 for each option sold. So, our total Profits would be ₹310 as there is no payoff required for call option.
₹2500	<b>Profit/Loss</b> $= \text{Profit/Loss on CashPosition} + \text{Profit/Loss on Selling Call Options}$ $= (\text{₹2500} - \text{₹2000}) + (\text{₹2400} - \text{₹2500} + ₹10)$ $= ₹500 - ₹90$ $= ₹410$ <span style="color: green;">MAXIMUM PROFIT</span>	We made a profit of ₹500 from share price increase but it was partly offset by ₹100 loss in the options. We also received ₹10 as premium. Going ahead any additional profit from cash would be offset by same exact value loss in options. So, the maximum profit that we can earn is ₹410.
₹1600	<b>Profit/Loss</b> $= (\text{₹1600} - \text{₹2000}) + (\text{₹10})$ $= -₹400 + ₹10$ $= -₹390$	We have a loss of ₹400. This loss is reduced by ₹10, which was the premium received from call sold.

This is how a covered call reduces the loss exposure. Note that the losses here are still unlimited. We can also have the opposite of this strategy to create a covered put position for reduced losses.

Let us discuss another example to better understand this.  
A man buys 100 shares of Asian Paints at ₹3000. He expects the price will decrease. Further, he sells a call option at a Strike price of ₹3500 for a premium of ₹150.



Let's say

**MARKET PRICE ON EXPIRY**

₹2600

**PROFIT/ LOSS**

**Profit/Loss**

$$\begin{aligned}
&= \text{Profit/Loss on Cash Position} + \\
&\quad \text{Profit/Loss on Selling Call Options} \\
&= (\text{₹2600} - \text{₹3000}) + (\text{₹150}) \\
&= -\text{₹400} + \text{₹150} \\
&= \text{₹-250}
\end{aligned}$$

**EXPLANATION**

The man will incur a loss of ₹400 from his stock position. However, he has also received ₹150 as call option premium which requires no payoff. We can see how option selling was used to reduce losses.

₹3500

### Profit/Loss

$$\begin{aligned}
 &= \text{Profit/Loss on Cash Position} + \\
 &\quad \text{Profit/Loss on Selling Call Options} \\
 &= (\text{₹3500} - \text{₹3000}) + (\text{₹150}) \\
 &= ₹500 + ₹150 \\
 &= ₹\boxed{650} \text{ MAXIMUM PROFIT}
 \end{aligned}$$

₹650 is also the maximum profit that the man can make.

₹4000

### Profit/Loss

$$\begin{aligned}
 &= \text{Profit/Loss on Cash Position} + \\
 &\quad \text{Profit/Loss on Selling Call Options} \\
 &= (\text{₹4000} - \text{₹3000}) + (\text{₹3500} - \text{₹4000}) \\
 &\quad + ₹150 \\
 &= ₹1000 - ₹350 \\
 &= ₹\boxed{650}
 \end{aligned}$$

₹3000

### Profit/Loss

$$\begin{aligned}
 &= \text{Profit/Loss on Cash Position} + \\
 &\quad \text{Profit/Loss on Selling Call Options} \\
 &= (\text{₹3000} - \text{₹3000}) + (\text{₹150}) \\
 &= ₹0 + ₹150 \\
 &= ₹\boxed{150}
 \end{aligned}$$

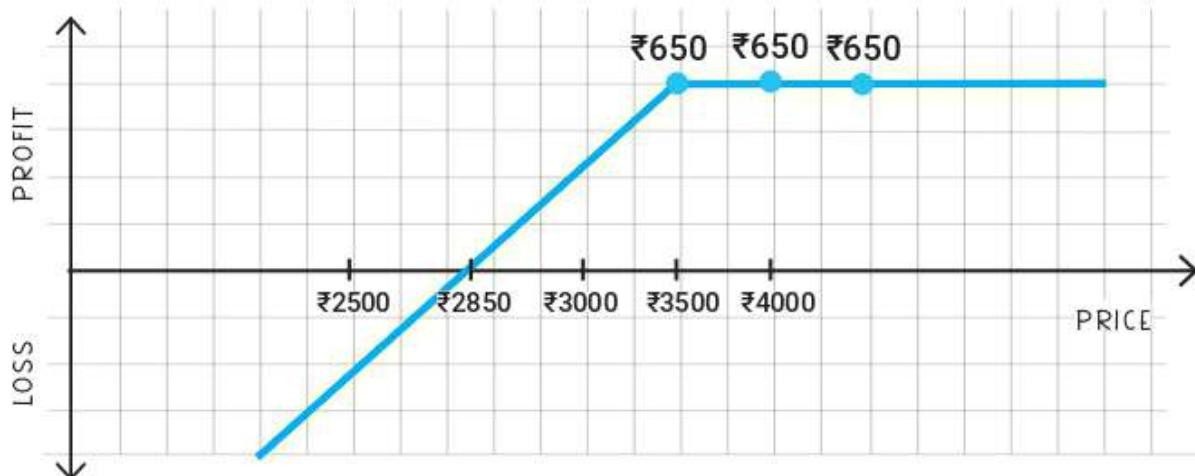
We see that the man has made a profit of ₹500 on each share that he owned. Also, he received ₹150 as premium on each call option sold. We can see that the man made a profit of ₹650 on each share.

The man has a profit of Rs. 1000 on each share. However, he also has a payoff to make of Rs. 500 on each option sold. Besides, he received Rs. 150 as premium. The total profit is Rs. 650 per unit of share.

We can see that despite increase in share value, the total profit is same. We can say that the profits in this strategy gets limited.

We can see that even when there is no change in share value, because the man has received upfront premium, he will make a profit of ₹150.

The payoff chart of the same can be drawn as under. We have Price on the X-axis and Profit or Loss on the Y-axis. The straight line indicates the maximum profit. The sloping line shows how the losses are reduced by ₹150 but, can go down to unlimited.



# SUMMING UP

## THE STRATEGIES

### PROTECTIVE PUT STRATEGY

To hedge long position.

Here we buy put options to hedge our stock portfolio.

Limited loss and unlimited profit potential.

### SYNTHETIC PUT STRATEGY

To hedge short position.

Here we buy call options to hedge our stock portfolio.

Limited loss and unlimited profit potential.

### COVERED CALL STRATEGY

Short Term Hedge on Long Portfolio to reduce losses.

Here we sell call options to collect premium and reduce losses if the market goes down.

Unlimited loss and limited profit potential.

# 10.5 STRADDLE OPTION STRATEGY



Explainer Video

Straddle is another strategy used for trading purposes and not for hedging. We may either have Long Straddle or a Short Straddle.

## LONG STRADDLE

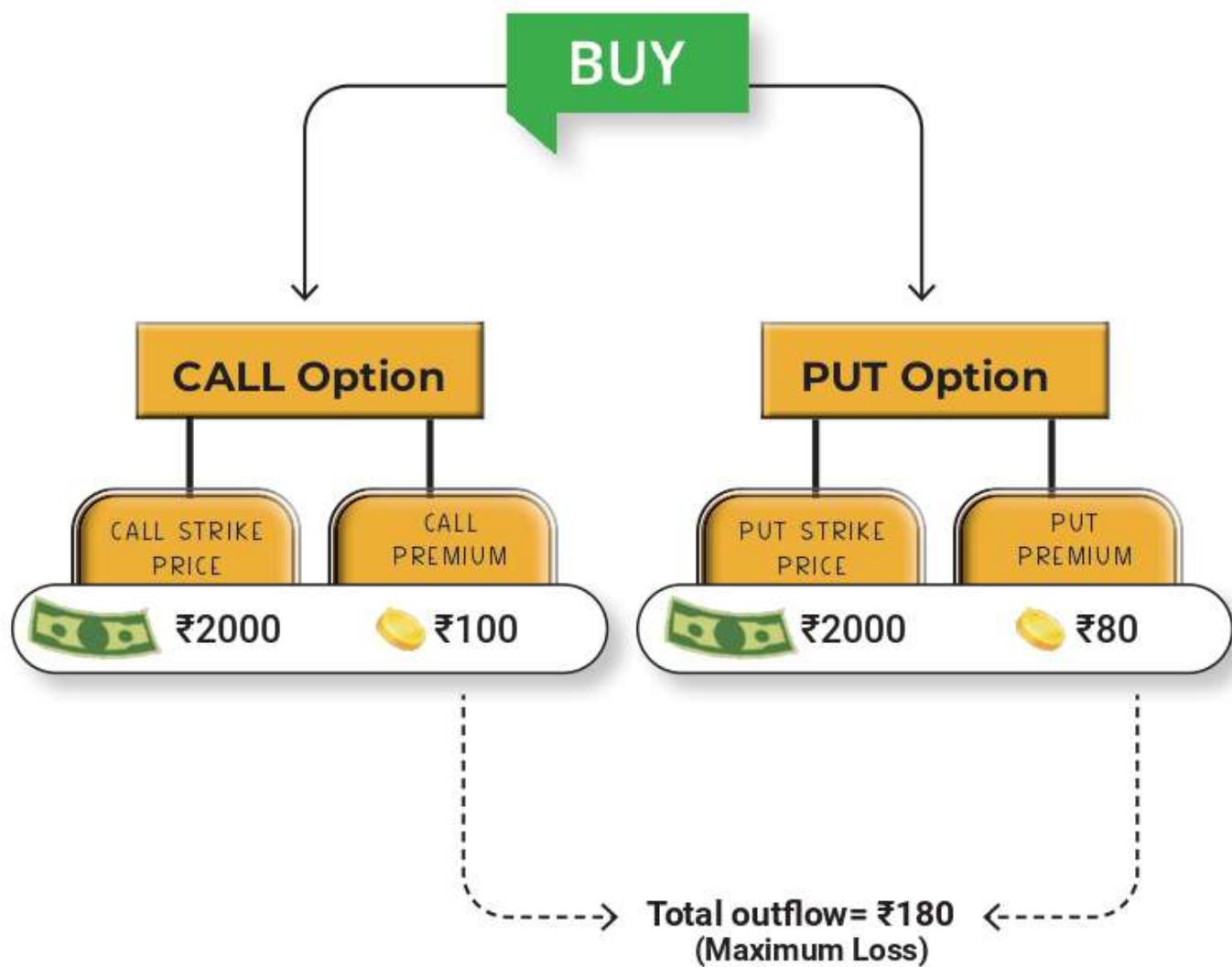
“ IN A LONG STRADDLE, YOU ARE BUYING AN ATM CALL AND AN ATM PUT OPTION AT THE SAME TIME AND ON THE SAME ASSET. ”



The Strike Price of the two is also the same or very close to each other and even the time to expiry. The Lot size of both the options is also the same. The expectation here is that the market would move either way (up or down) with some significant movements.

**For instance**, we have a stock at CMP = ₹2000.

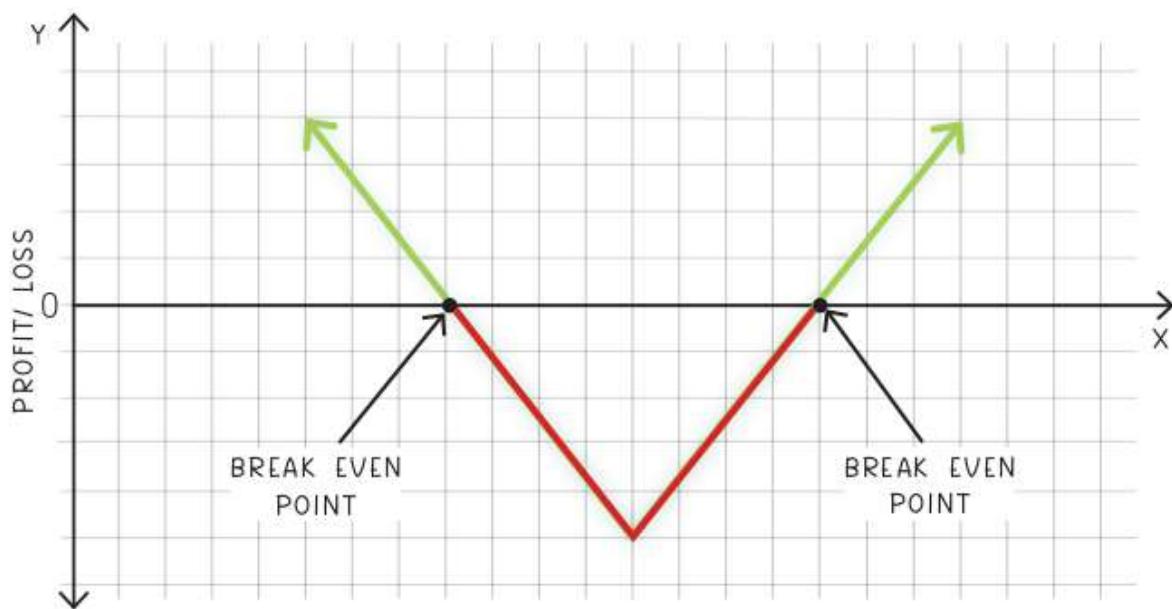
With this, to create a straddle, we will buy a Call and a Put at a Strike Price of ₹2000. The respective premiums for the two are, Call Premium = ₹100, Put Premium = ₹80. The time to expiry and Lot size being the same.



Now, in this strategy, we want the price movement in the markets to be huge. The direction does not matter but high volatility does. If the price does not move more than ₹180, we would have loss. Straddle is a strategy that is used when you expect high volatility but do not want to guess the direction. Here, if the stock moves in either direction by ₹180, the strategy will be profitable, else loss making.

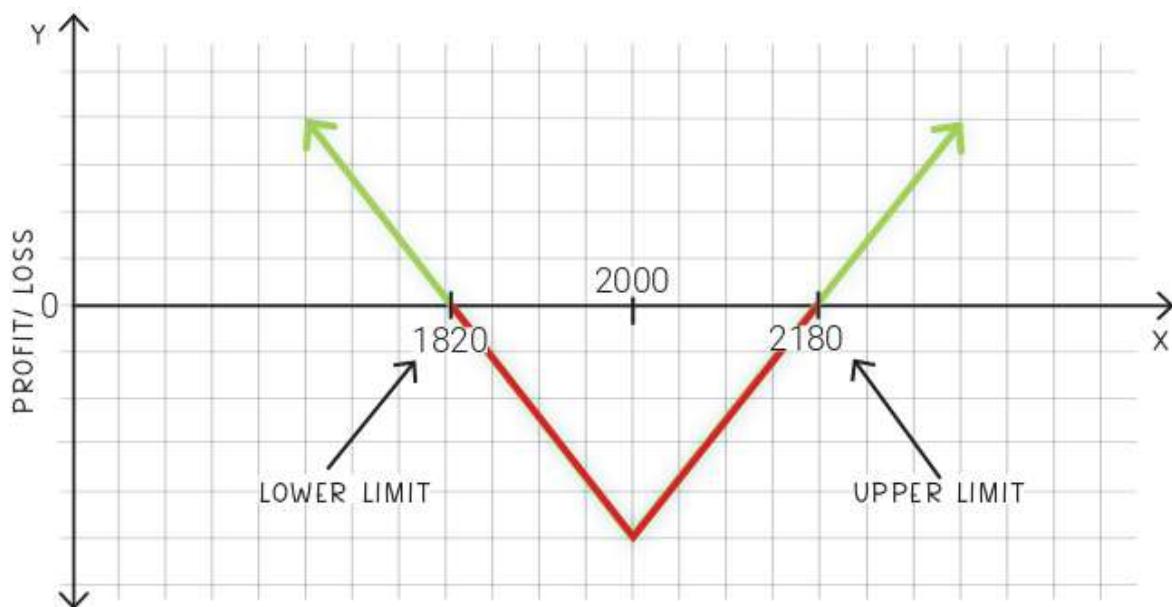
We want the price movement to be beyond a range with respect to this premium amount.

**BREAK EVEN POINT = STRIKE PRICE +/- TOTAL PREMIUM.**



In this case, we want the price to move beyond the range of ₹1820 – ₹2180. The lower limit here is the ₹1820 (₹2000 – ₹180). For us to have success with this strategy, we want the price movement to be below this lower limit.

Alternatively, the upper limit is ₹2180 (₹2000 + ₹180). Again, we want the price to cross this upper limit.



In this strategy, we are not forecasting the direction of the movement. We are just trading based on our assumption of high volatility.

## SHORT STRADDLE

“ IN A SHORT STRADDLE, YOU ARE SELLING AN ATM CALL AND AN ATM PUT OPTION AT THE SAME TIME AND ON THE SAME ASSET. SHORT STRADDLE IS A STRATEGY TO FOLLOW WHEN YOU EXPECT LOW VOLATILITY.



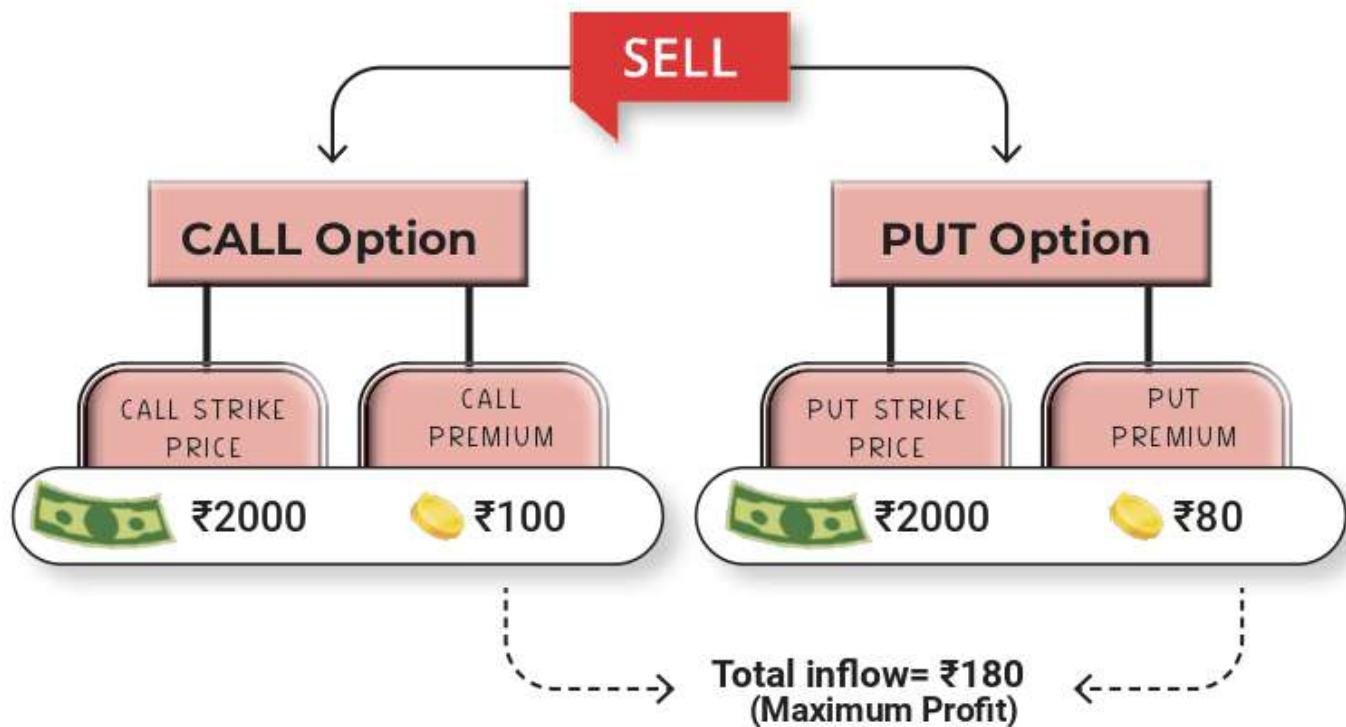
The Strike Price of the two is also the same or very close to each other and even the time to expiry.

The Lot size of both the options is also the same.

The expectation here is that the market would have low volatility. It would not move in either direction by a significant amount.

THE OBJECTIVE WITH SUCH A STRATEGY IS AGAIN TO COLLECT PREMIUM AS PROFIT AND HAVE NO PAYOFF AGAINST IT AT EXPIRY.

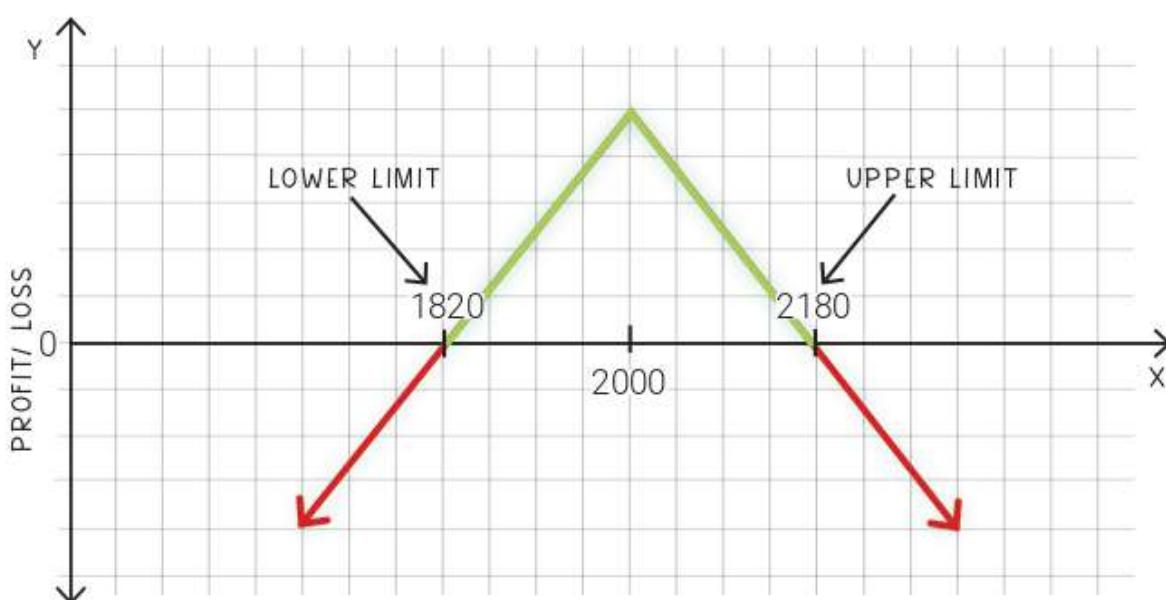
**For instance,** again, we have a stock at CMP = ₹2000. With this, to create a short straddle, we will sell a Call and a Put at a Strike Price of ₹2000. The respective premiums for the two are, Call Premium = ₹100, Put Premium = ₹80. The time to expiry and Lot size being the same.



Now, in this strategy, we want the price movement in the markets to be low (limited to a range). The direction does not matter but low volatility does. If the price moves more than ₹180, we would have a loss. We want the price movement to be limited to a range with respect to this amount.

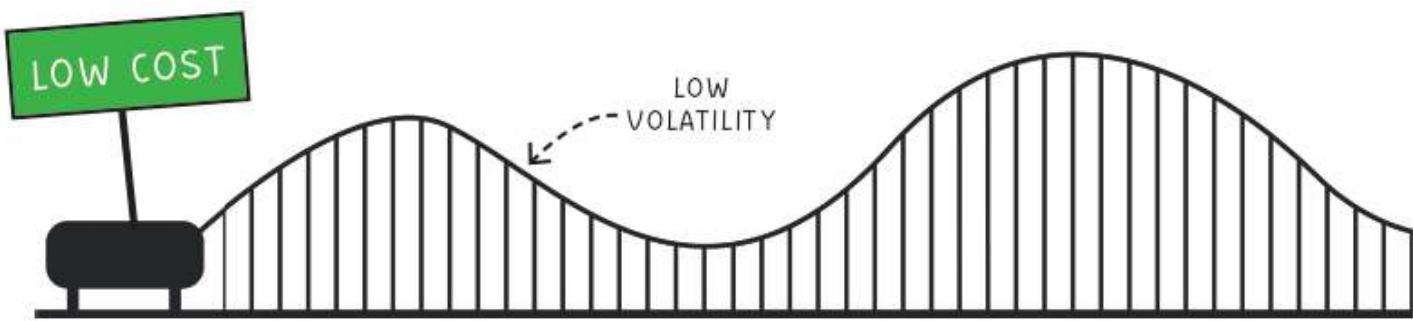
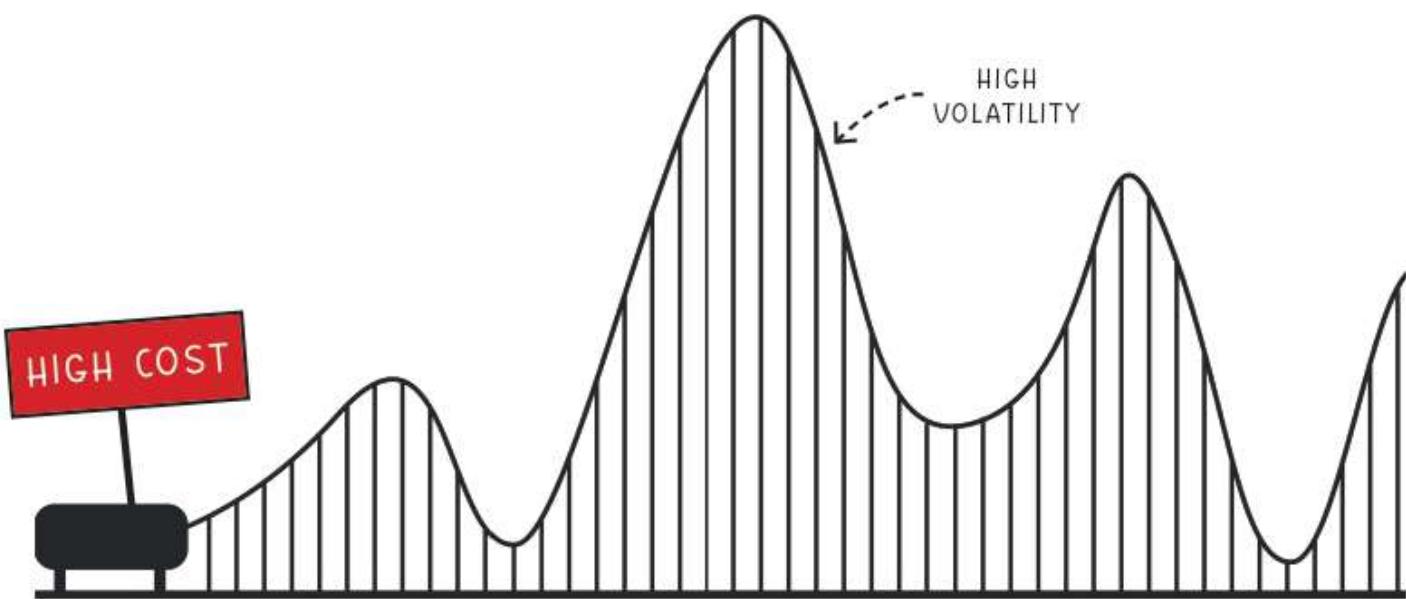
Limited Range = Strike price  $\pm$  Total Premium.

In this case, we want the price to move within the range of ₹1820 – ₹2180.



Again as we discussed, we do not have any position on the direction of the movement. We are taking a position on the expected volatility. When we use short straddle, we want low volatility i.e. the price to be in the range of ₹1820 and ₹2180 in this case.

Now, as we studied in the option pricing chapter. One of the factors that affect option pricing is volatility. Since a straddle is based on volatility expected in the market, the cost of the straddle may change. So, if the market is highly volatile, the cost of straddle increases. The cost of straddle therefore is high when the market as a whole expects high volatility going ahead.



Similarly, as the market shows low volatility, the premium received from short straddle would be reduced.

We can even get creative with this strategy by buying different call options and put options. We can modify the strategy and experiment and evaluate payoffs, risk and reward under different circumstances.

# SUMMING UP

## STRADDLE OPTION STRATEGIES

### LONG STRADDLE

BUY

Buy ATM  
call and  
ATM put  
option

Bought  
together

Same  
quantity and  
strike price

Assumption :  
high volatility

### SHORT STRADDLE

SELL

Sell ATM  
call and an  
ATM put  
option

Sold  
together

Same  
quantity and  
strike price

Assumption :  
low volatility

# 10.6 PAYOFF CHARTS FOR LONG STRADDLE



Explainer Video

**For instance,** a person buys a lot size of 100 shares of XYZ at the money call option and put option at a Strike price of ₹400.

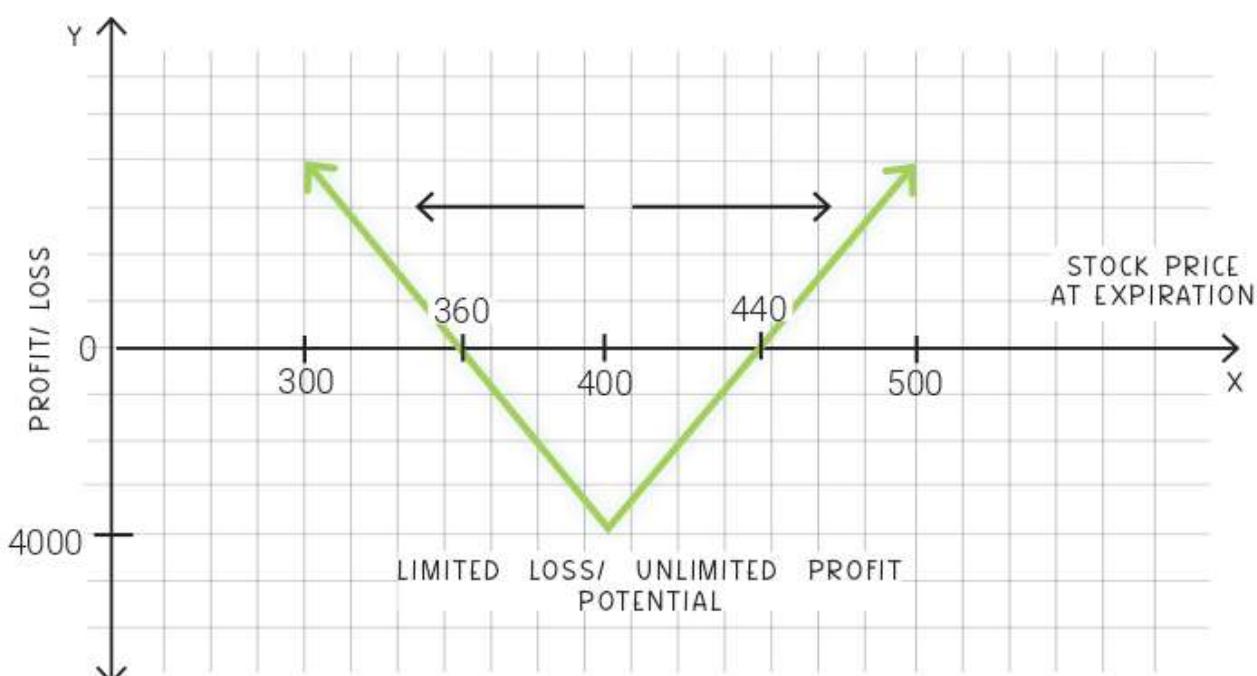
The premium for call = ₹19.

The premium for put = ₹21.



The total premium = ₹40 ( $\text{₹}19 + \text{₹}21$ )  $\times 100$  (lot size)  
= ₹4000 (Maximum Loss).

Therefore, the break-even range = ₹360 ( $\text{₹}400 - \text{₹}40$ ) to ₹440 ( $\text{₹}400 + \text{₹}40$ ).



The following is the graphical representation of a Long Straddle Option. The X-axis shows Profit or Loss. The Y-axis shows Stock Price at expiration.

Let us assume different price Scenarios:

MARKET PRICE ON EXPIRY	NET PROFIT/ LOSS	EXPLANATION
₹500	<p><b>Call Payoff</b> = ₹500 – ₹400 = ₹100</p> <p><b>Profit from Call</b> = ₹100 x 100 = ₹10,000</p> <p><b>Net profit</b> = Call profit -Total Premium = ₹10,000 – ₹4000 = ₹6000</p>	The call option is exercised. Put Option is not exercised here. The call would give a payoff of ₹100 , profit of ₹10,000 and net profit will be ₹6000.
₹300	<p><b>Put Payoff</b> = ₹400 – ₹300 = ₹100</p> <p><b>Profit from Put</b> = ₹100 x 100 = ₹10,000</p> <p><b>Net profit</b> = Put profit -Total Premium = ₹10,000 – ₹4000 = ₹6000</p>	The call option is not exercised. However, the put is exercised. The put would give a payoff of ₹100, profit of ₹10,000 and net profit will be ₹6000.
₹420	<p><b>Call Payoff</b> = ₹420 – ₹400 = ₹20</p> <p><b>Profit from Call</b> = ₹20 x 100 = ₹2000</p> <p><b>Net Loss</b> = Call profit -Total Premium = ₹2000 – ₹4000 = (₹2000)</p>	The call option is exercised. However, the put is not exercised. The call would give a payoff of ₹20, profit of ₹2000. So the total loss incurred here is ₹2000 after the payout from call option.

As we can see from the payoff charts as well, the maximum losses are at the strike price of both the options. As we move in either direction, the losses begin to reduce and after the break-even point, we move into profits.

# 10.7 PAYOFF CHARTS FOR SHORT STRADDLE



Explainer Video

**For instance,** a person sells a lot size of 100 shares of XYZ at the money call option and put option at a Strike price of ₹400.

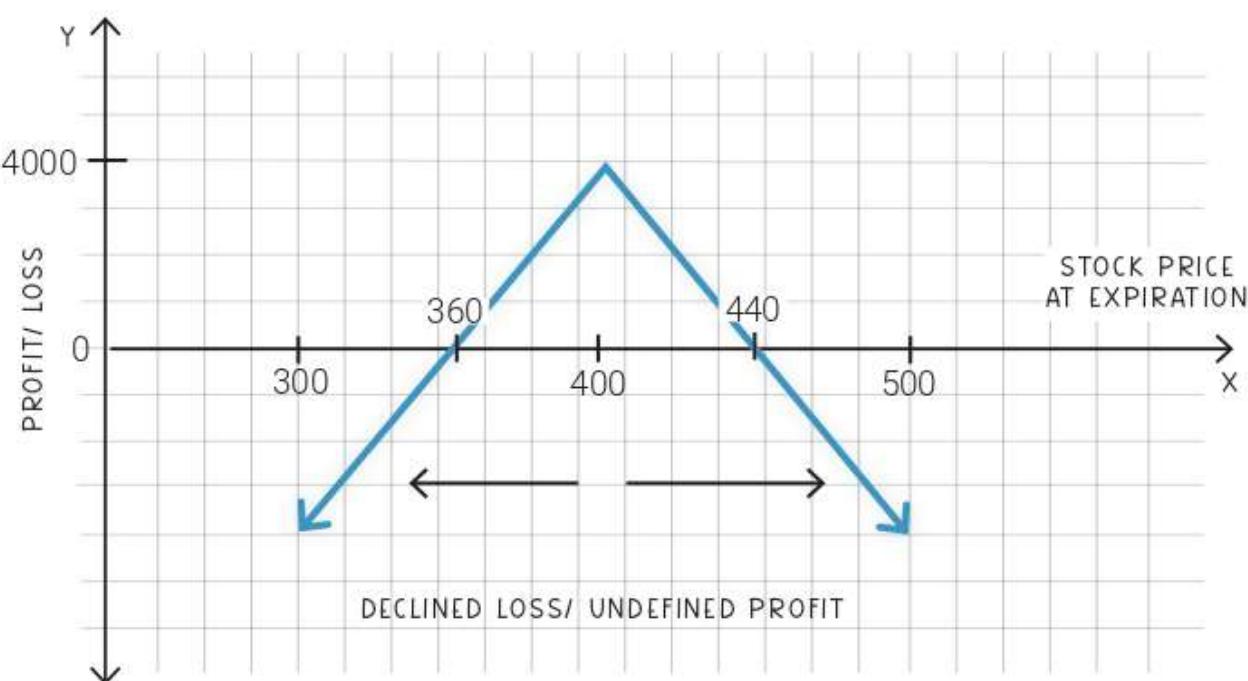
The premium for call = ₹19.

The premium for put = ₹21.



$$\begin{aligned}\text{The total premium} &= ₹400 (\₹19 + ₹21) \times 100 \text{ (lot size)} \\ &= ₹4000 \text{ (Maximum Profit)}\end{aligned}$$

Therefore, the limited profit range = ₹360 (₹400 – ₹40) to ₹440 (₹400 + ₹40).



The following is the graphical representation of a Long Straddle Option. The X-axis shows Profit or Loss. The Y-axis shows Stock Price at expiration.

Let us assume different price Scenarios:

MARKET PRICE ON EXPIRY	NET PROFIT/ LOSS	EXPLANATION
₹500	<p><b>Call Payoff</b> = ₹500 – ₹400 = ₹100</p> <p><b>Loss from Call</b> = ₹100 x 100 = ₹10,000</p> <p><b>Net Loss</b> = Call Loss -Total Premium = ₹10,000 – ₹4000 = ₹6000</p>	The call option is exercised. Put Option is not exercised here. The call would take an obligated a payoff of ₹100 , loss of ₹10,000 and net loss will be ₹6000.
₹300	<p><b>Put Payoff</b> = ₹400 – ₹300 = ₹100</p> <p><b>Loss from Put</b> = ₹100 x 100 = ₹10,000</p> <p><b>Net Loss</b> = Put Loss -Total Premium = ₹10,000 – ₹4000 = ₹6000</p>	The call option is not exercised. However, the put is exercised. The put would take an obligated payoff of ₹100, Loss of ₹10,000 and net loss will be ₹6000.
₹420	<p><b>Call Payoff</b> = ₹420 – ₹400 = ₹20</p> <p><b>Loss from Call</b> = ₹20 x 100 = ₹2000</p> <p><b>Net Profit</b> = Call loss -Total Premium = ₹2000 – ₹4000 = ₹2000</p>	The call option is exercised. However, the put is not exercised. The call would take an obligated payoff of ₹20, So, the losses due to call payout would be ₹2000. The net profit would be reduced to ₹2000 after the payoff.

As we can see, the maximum profits are the strike price. As we move in either direction, the profits start to decrease. Outside the range of break-even points, the profits turn into losses and we have potential for unlimited losses as we are selling options.

# 10.8 COLLAR OPTION STRATEGY



Explainer Video

“

A COLLAR OPTION STRATEGY IS A TRADING AS WELL AS A HEDGING STRATEGY WHICH INCLUDES BUYING A PROTECTING PUT AND SELLING A COVERED CALL OPTION TOGETHER. THIS IS A STRATEGY WITH LIMITED PROFITS AND LIMITED LOSSES.

”



This strategy is used when one expects a decrease in price. Here, the upside as well as the downside are limited. The exposure is limited on both sides.

It can also be understood as a combination of both Protective Put and Covered Call Strategy.

The Steps involved in forming a Collar Option Strategy are:

- 1 Own an Underlying asset (stock/ index)
- 2 Buy a put option (Strike price below market price i.e., ITM) to provide protection against downside risk.
- 3 Finance put option premium by selling a call option (Strike Price above the Market Price i.e. OTM)

**1** Short an underlying asset in cash or futures market (Stock/Index)

**2** Buy a Call Option with strike price above the Market price i.e. OTM to protect against a large increase in price of the underlying asset.

**3** Finance the purchase of the call option by selling a put option with strike price below the market price. This would help us with a short position on the collar.

Alternatively, we may:

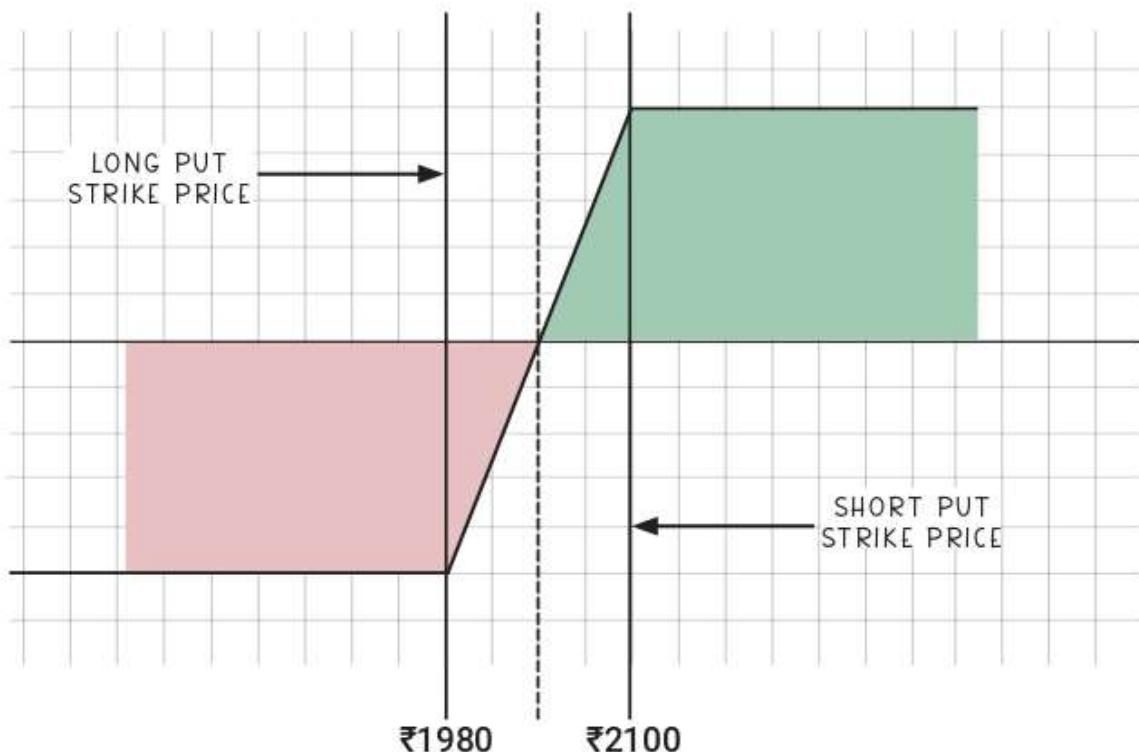
**For instance**, we own stock at ₹2000. To create a collar option strategy, we buy a put option at a Strike Price of ₹1980 at a premium of 30.



To finance the put option premium amount, we sell a call option at a Strike Price of ₹2100 at a premium of ₹10.



So, our total cost of having this protection has come down by ₹10.  
Total cost now = ₹30 - ₹10 = ₹20.



The maximum profit that we can have under this strategy is ₹80 from current position and maximum loss is limited to ₹40. We can see that the maximum profits and losses are limited under this strategy.

This setup helps us limit our downside as well as our upside. Also, it reduces our premium cost involved in creating this protection for our position. Essentially, we are creating collars around the position to cap our exposure to potential profits and losses as the market price moves. These are very commonly used to hedge positions.

## **CHAPTER 11**

# **VERTICAL SPREAD OPTION STRATEGIES**

- 11.1 Introduction
- 11.2 Types of spreads
- 11.3 Bull Call Spread Strategy
- 11.4 Bear Call Spread Strategy
- 11.5 Bear Put Spread Strategy
- 11.6 Bull Put Spread Strategy
- 11.7 Strangle Strategy
- 11.8 Butterfly Spread Strategy
- 11.9 Things to keep in mind before entering F&O market!

## 11.1 INTRODUCTION

Vertical Spread involves buying and selling of options of the same type (either put or call) and same expiry but at different strike prices.

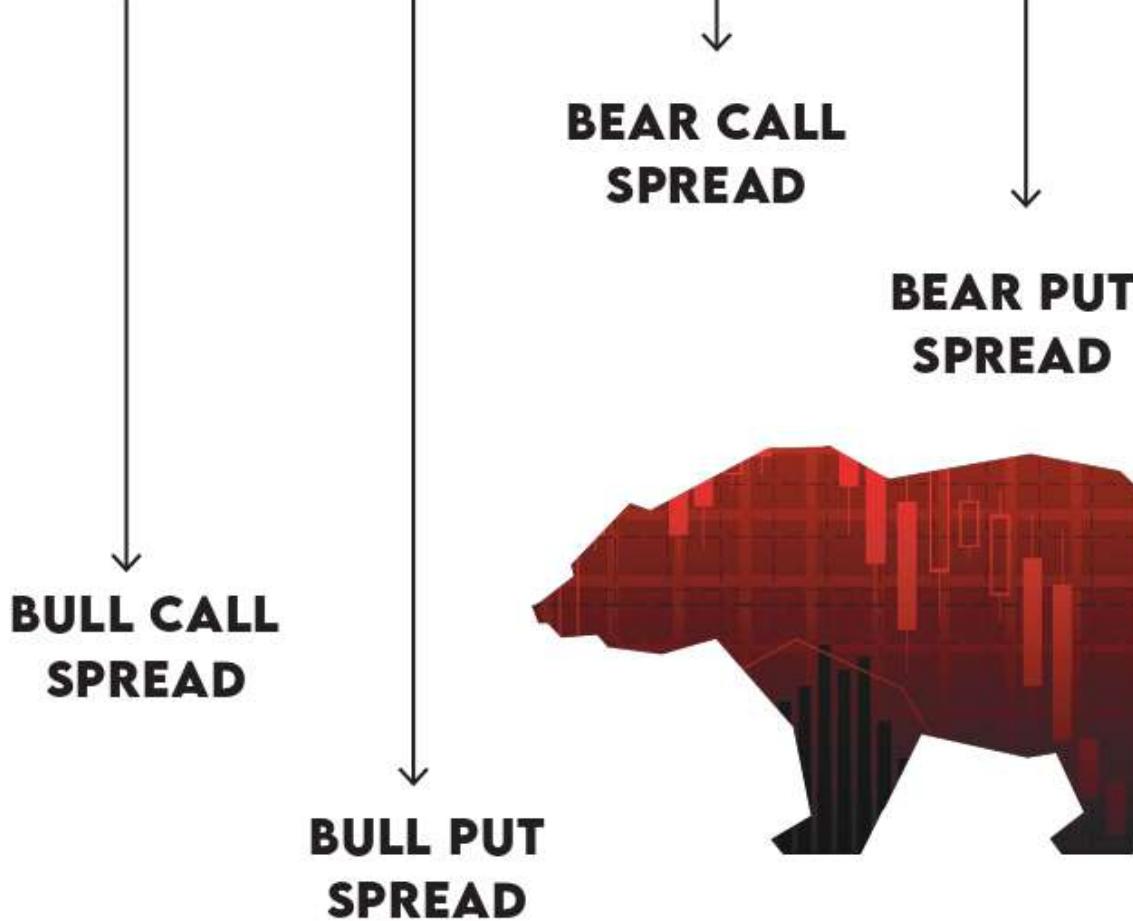
*For instance,*



Such strategies are used over buying plain vanilla options to bring down the upfront premium investment and as a result the overall risk.

## 11.2 TYPES OF SPREADS

The spreads that we can create are essentially of 4 types. Namely:



CALL SPREAD MEANS  
BUYING AND SELLING  
CALL OPTIONS.

We create a **Bull Call Spread** when we are expecting the markets to go up. Based on our opinion, when we have a Bullish view, we may go ahead with Bull Call Strategy. We will learn in the next segment how to form a Bull Call spread but we profit when the underlying asset price goes up.



Similarly, we create a **Bear Call Spread** when we expect that the markets are going to go down. Bearish Call Strategy is the opposite side of Bull Call Strategy. We profit when the price of underlying asset goes down.

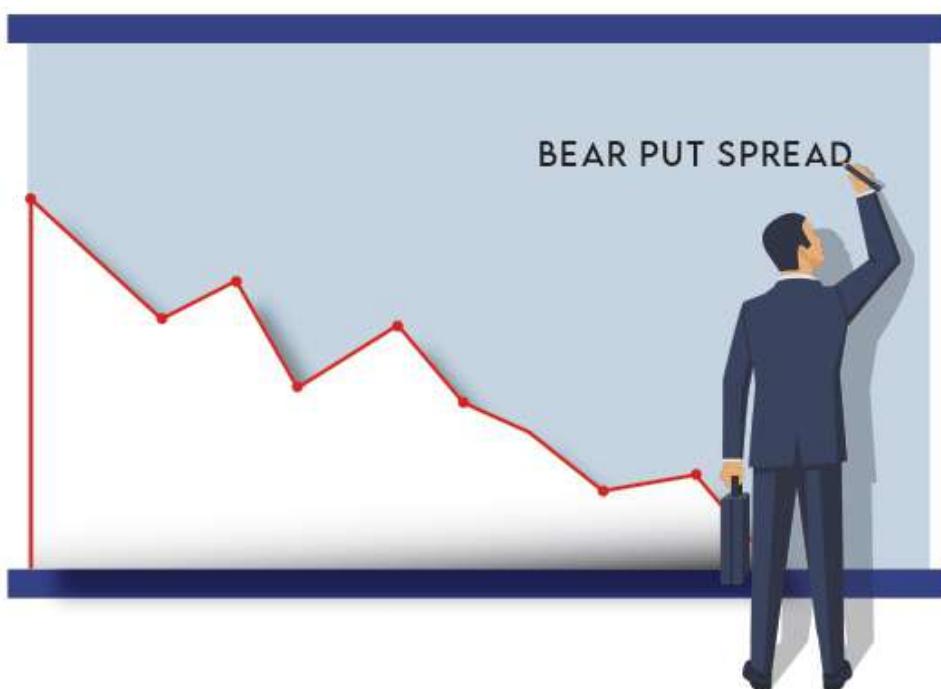


PUT SPREAD MEANS  
BUYING AND SELLING  
PUT OPTIONS.

We create a **Bull Put Spread** when we are expecting the markets are going to go up. Based on our analysis, if we expect the market to stay bullish, put bull spread is alternate method to profit from the same.



Similarly, we create a **Bear Put Spread** when we expect that the markets are going to go down. Bear Put Spread is created using a combination of put combination. We profit when the price of the asset goes down.



Let us discuss these strategies in-depth one by one.

# 11.3 BULL CALL SPREAD STRATEGY



Explainer Video

This strategy is used when we are bullish on the underlying asset. This strategy has limited profit and loss potential. We have to pay a net premium to enter into this trade.

## STEPS TO FORM AN BULL CALL SPREAD STRATEGY

**BUY**

We buy a call option with strike price being lower than the levels that we expect the underlying asset price to reach.



**SELL**

We will sell a call option with a strike price that is higher than the strike price of the option that we have purchased.

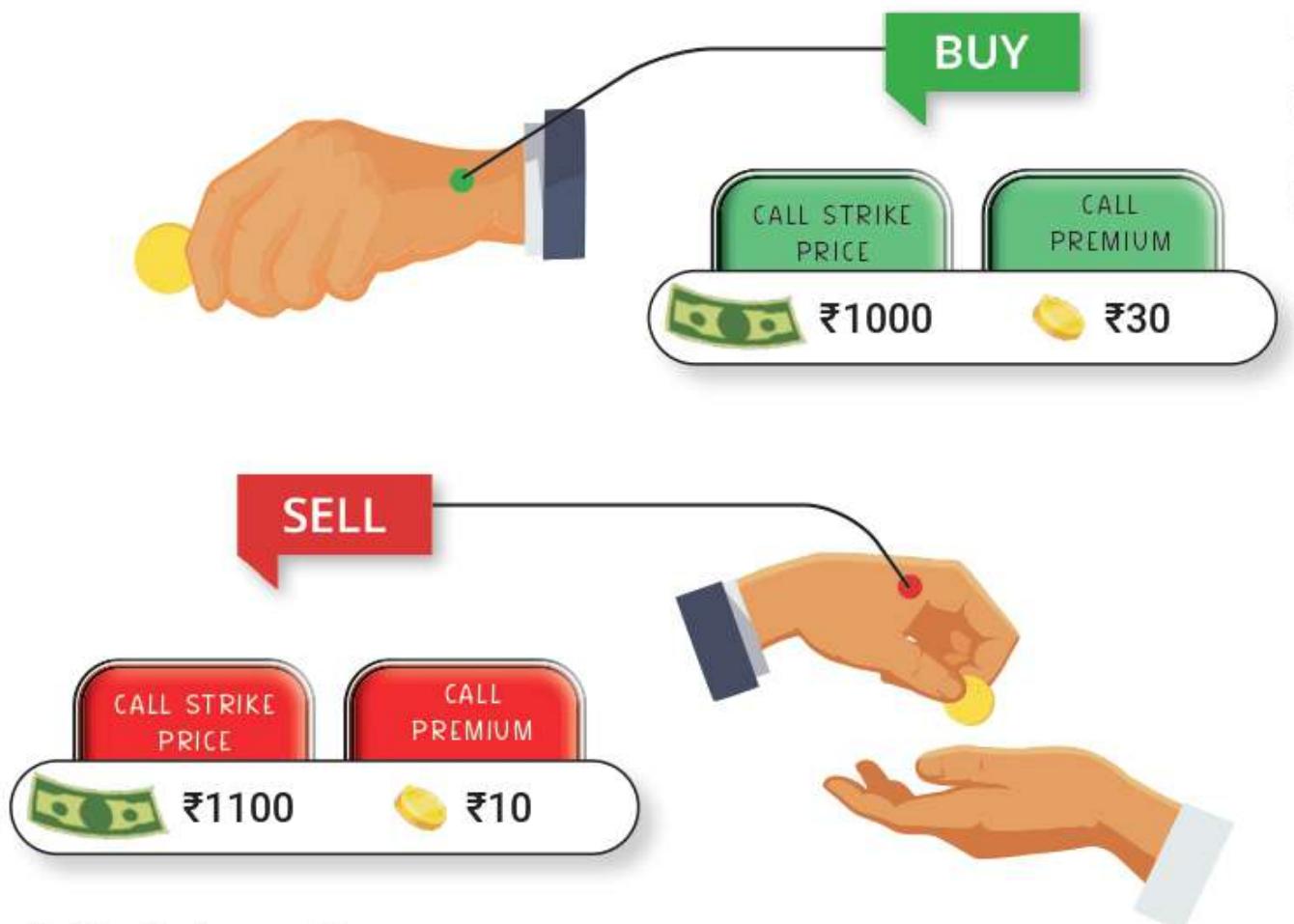


**MAXIMUM LOSS** = PREMIUM PAID ON OPTION 1 - PREMIUM RECEIVED ON OPTION 2

**BREAK-EVEN POINT** = LOWER STRIKE + NET PREMIUM

**MAXIMUM PROFIT** = DIFFERENCE IN STRIKE - NET PREMIUM

**For instance**, we buy a call option at ₹1000 at a premium of ₹30 and we sell another call option at ₹1100 for a premium of ₹10.



Netting the two positions.

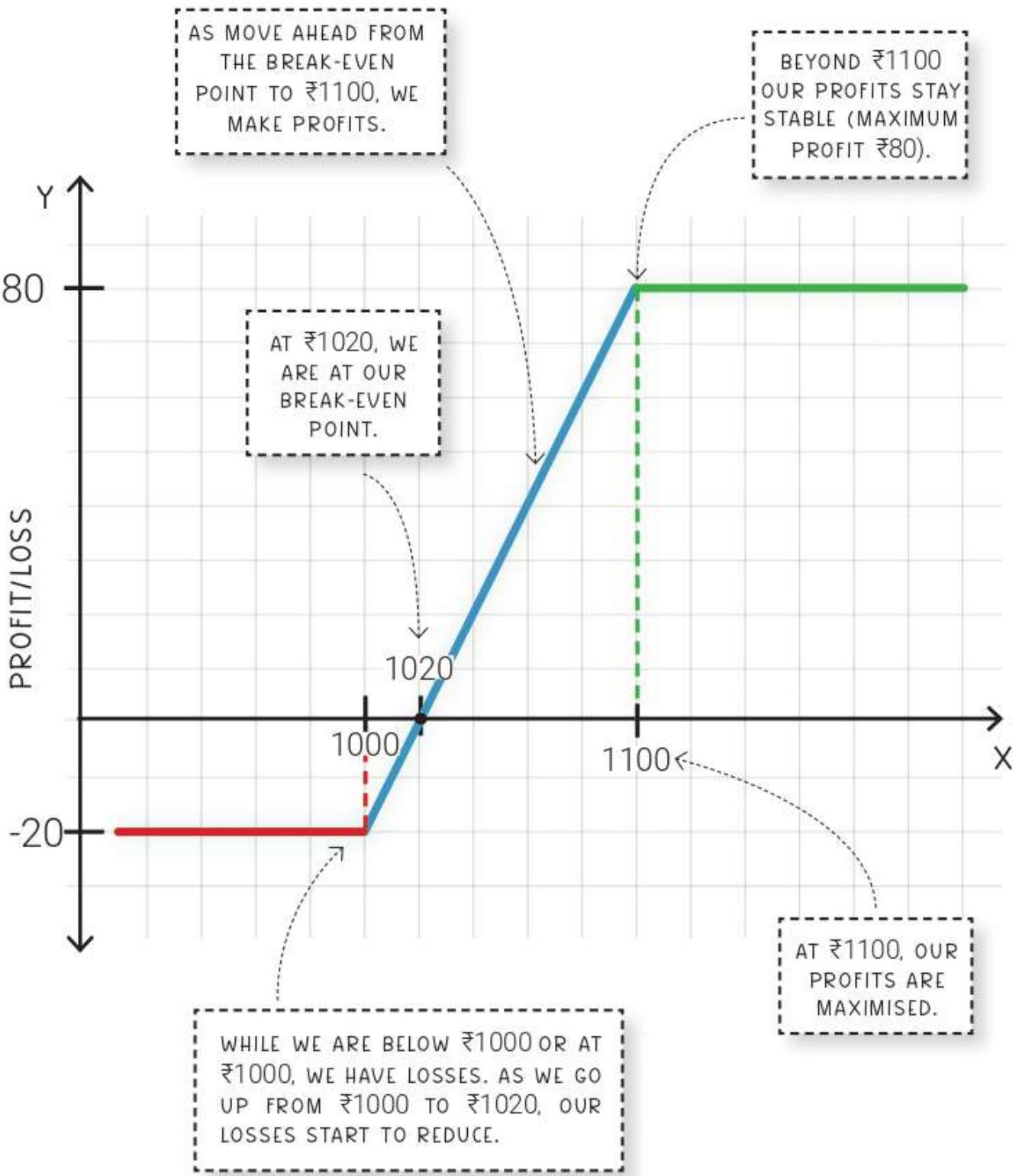
$$\text{COST OF CREATING THE STRATEGY} = ₹30 - ₹10 = ₹20$$

THIS IS OUR NET INVESTMENT IN THIS STRATEGY.

$$\begin{aligned}\text{MAXIMUM LOSS} &= \text{Net premium} \\ &= ₹20\end{aligned}$$

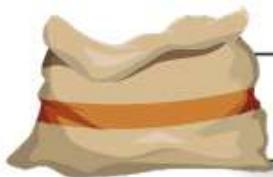
$$\begin{aligned}\text{BREAK EVEN POINT} &= \text{Lower strike price} + \text{Net premium cost} \\ &= ₹1000 + ₹20 = ₹1020\end{aligned}$$

$$\begin{aligned}\text{MAXIMUM PROFIT} &= \text{Difference in Strike prices} - \text{Net Premium} \\ &= (₹1100 - ₹1000) - ₹20 = ₹80\end{aligned}$$



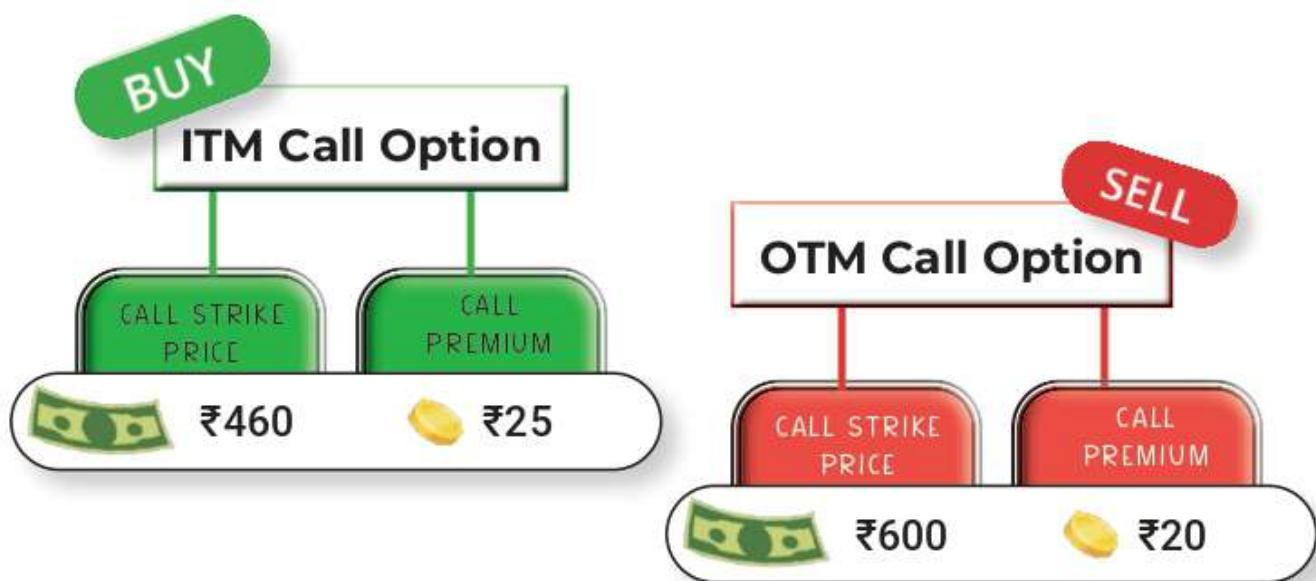
As price on expiry moves beyond ₹1100, the payoff on the option that we had sold starts to increase. This happens by the exact same amount as we receive on the call option that we had purchased. This is why we can say that the maximum profits are limited in this strategy.

Let's take another example on this.



LOT SIZE  
100 shares

CURRENT MARKET PRICE  
₹470



Price	Buy Option	Sell Option
Price < ₹460	<input checked="" type="checkbox"/> Exercised	<input checked="" type="checkbox"/> Exercised
Price = ₹500	<input checked="" type="checkbox"/> Exercised	<input checked="" type="checkbox"/> Exercised
Price > ₹600	<input checked="" type="checkbox"/> Exercised	<input checked="" type="checkbox"/> Exercised



**NET INVESTMENT/MAXIMUM LOSS** = Net premium  
 $= ₹25 - ₹20$   
 $= ₹5$

So, while we are below ₹460 or at ₹460, we are in losses. As we go up from ₹460 to ₹465, we start to recover our losses.



**BREAK EVEN POINT** = Lower strike price + Net premium cost  
 $= ₹460 + ₹5$   
 $= ₹465$

As we move beyond ₹465 break-even point to ₹600, we make profits. But at ₹600, again, our profits are capped.



**MAXIMUM PROFIT** = Difference in Strike prices - Net Premium  
 $= (₹600 - ₹460) - ₹5$   
 $= ₹135$

Beyond ₹600, our profits stay same as the profits received from call option bought is offset by the profit from call option sold.

# 11.4 BEAR CALL SPREAD STRATEGY



Explainer Video

Bear call spread is exactly opposite to bull call spread. This strategy is used when we are bearish on the underlying asset. Bear Call Spread gives us limited profits and limited loss opportunity. Also, we receive Net Spread here instead of paying.

## STEPS TO FORM A BEAR CALL SPREAD STRATEGY

BUY

We buy a call option at a strike price that would be higher than the call option that we would be selling. This is required to convert unlimited loss potential of Selling option to limited loss potential.

SELL

We will sell an option with a strike price that is higher than the current market price. We do not want the market price on expiry to be higher than this strike price as it will lead to losses.

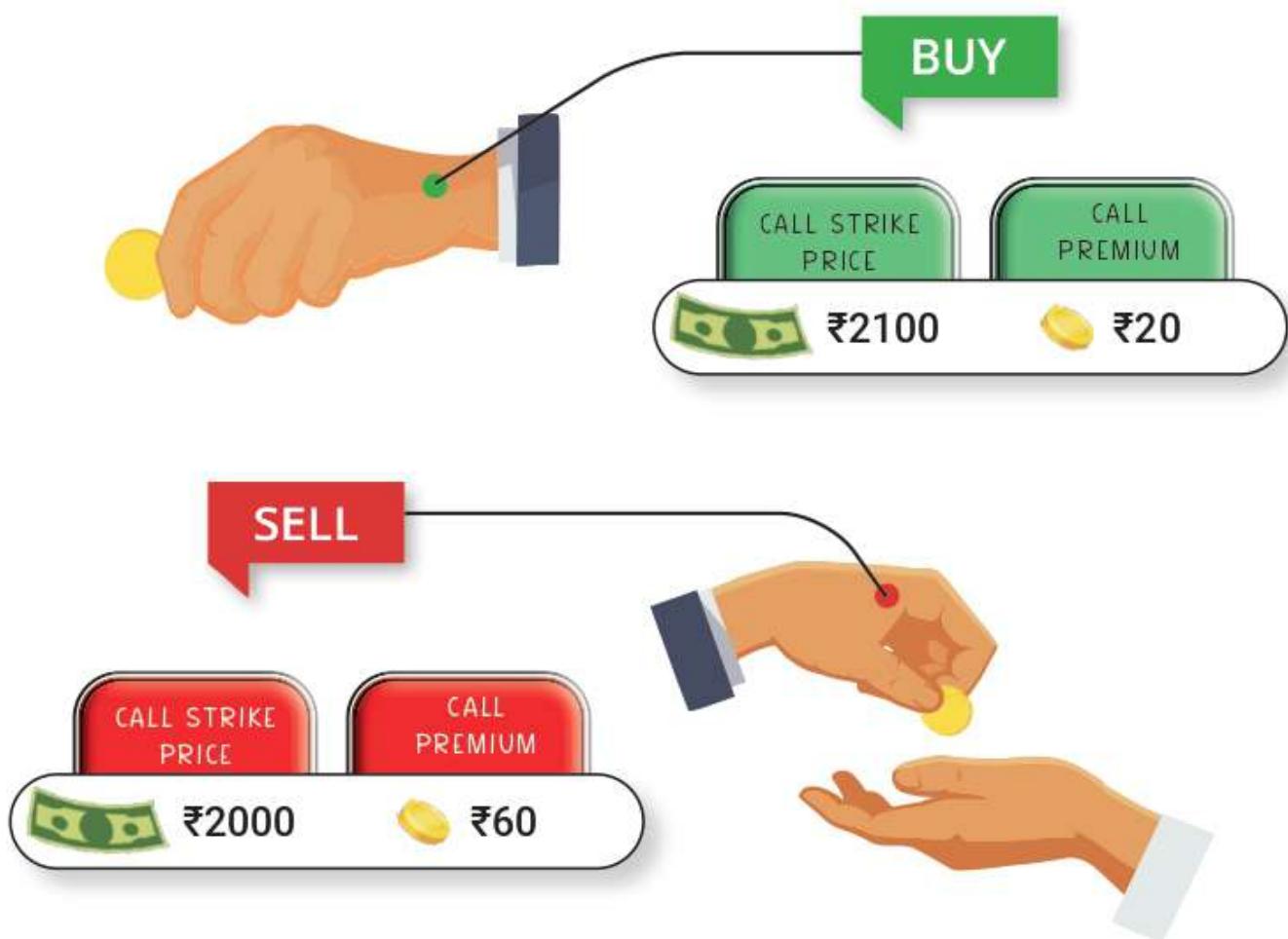


**MAXIMUM LOSS = DIFFERENCE IN STRIKE PRICE OF TWO OPTIONS - NET PREMIUM RECEIVED.**

**BREAKEVEN POINT = LOWER STRIKE + NET PREMIUM**

**MAXIMUM PROFIT = NET PREMIUM**

**For instance,** we buy a call option at ₹2100 at a premium of ₹20 and we sell another call option at ₹2000 for a premium of ₹60.



Netting the two positions,

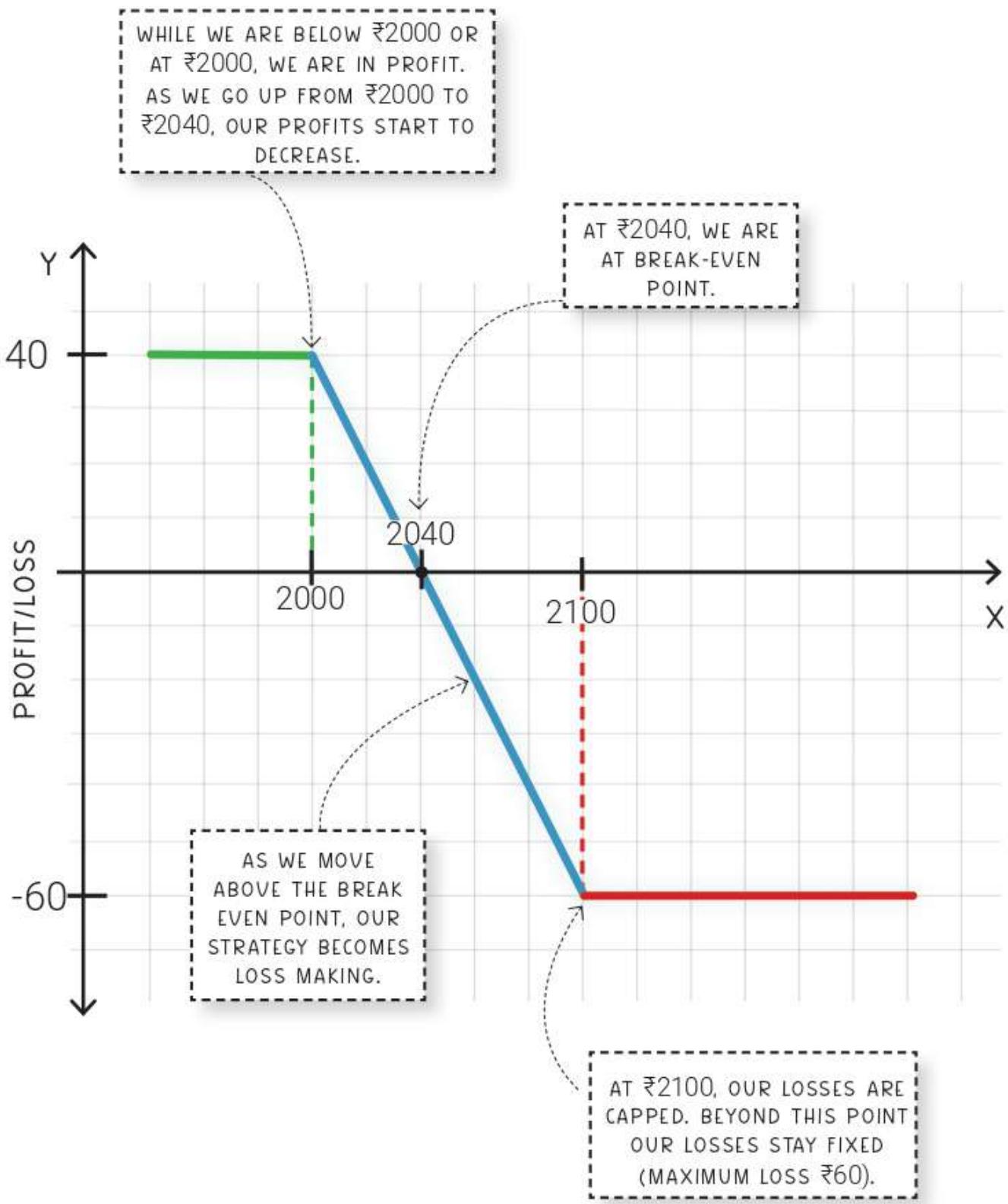
**PROFIT FROM CREATING THE STRATEGY = ₹60 - ₹20 = ₹40**

THIS IS OUR NET PREMIUM RECEIVED IN THIS STRATEGY.

**MAXIMUM PROFIT** = Net Premium  
= ₹40

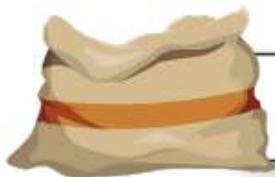
**BREAK EVEN POINT** = Lower strike price + Net premium cost  
= ₹2000 + ₹40 = ₹2040

**MAXIMUM LOSS** = Difference in Strike prices – Net premium  
= (₹2100 - ₹2000) - ₹40 = ₹60



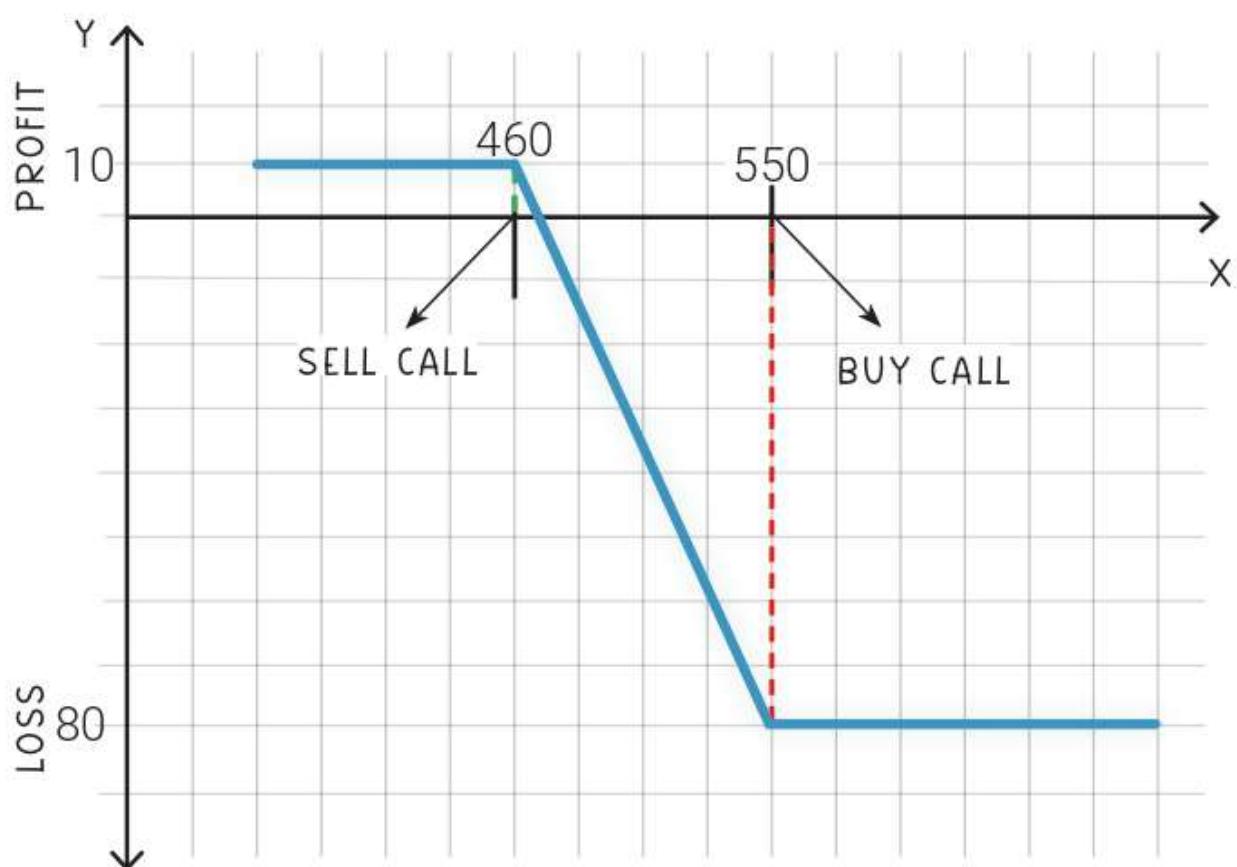
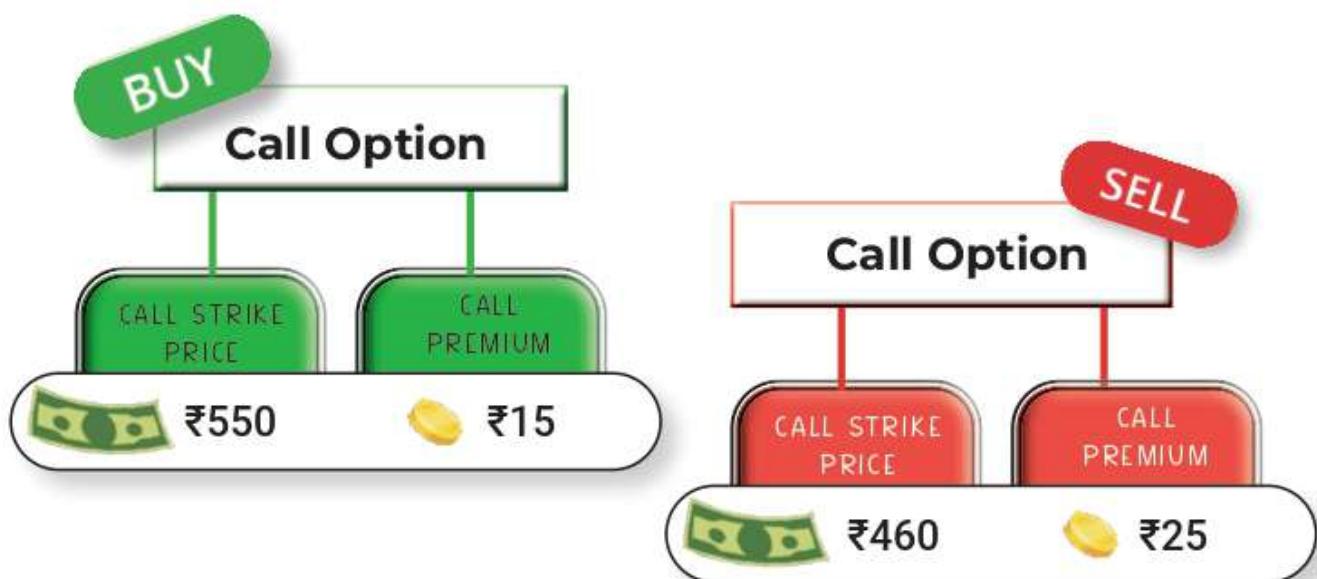
Beyond ₹2100, the profits we make from the call option bought are exactly same as the losses we make on call option sold. This is why the maximum losses are fixed at ₹60 in this case.

Let's take another example on this.



LOT SIZE  
100 shares

CURRENT MARKET PRICE  
₹470



Price	Buy Option CE550	Sell Option CE460
Price < ₹460	✗ Exercised	✗ Exercised
Price = ₹500	✗ Exercised	✓ Exercised
Price > ₹600	✓ Exercised	✓ Exercised



**NET INFLOW/MAXIMUM PROFIT** = Net premium

$$= ₹25 - ₹15$$

$$= ₹10 \text{ per share}$$

So, while we are below ₹460 or at ₹460, we are in profits. As we go up from ₹460 to ₹470, our profits start to reduce.



**BREAK EVEN POINT** = Lower strike price + Net premium

$$= ₹460 + ₹10$$

$$= ₹470$$

As we move beyond break-even point to ₹550, we make losses. At ₹550, again, our losses are capped.



**MAXIMUM LOSS** = Difference in Strike prices - Net Premium

$$= (₹550 - ₹460) - ₹10$$

$$= ₹80$$

Beyond ₹550, we have reached maximum losses any increase in price will not increase our loss.

# 11.5 BEAR PUT SPREAD STRATEGY



Explainer Video

The bear put spread strategy is more or less similar to call spread strategy, but with put options and to be used when we expect the underlying asset's price to go down. This strategy is used when we are Bearish on the underlying asset. This strategy would also limit our upside potential profit as well as losses. In this strategy a net premium is paid as compared to received.

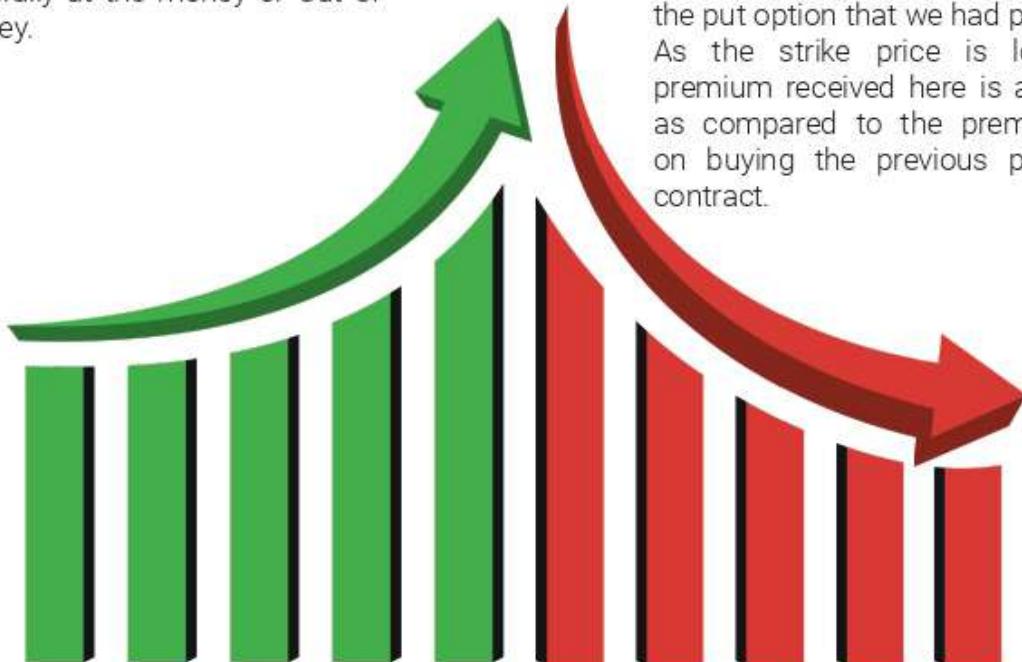
## STEPS TO FORM A BEAR PUT STRATEGY

BUY

We buy a Put Option with which is generally at the money or Out of money.

SELL

We sell a put option with Strike price that is lower than the strike price of the put option that we had purchased. As the strike price is lower, the premium received here is also lower as compared to the premium paid on buying the previous put option contract.

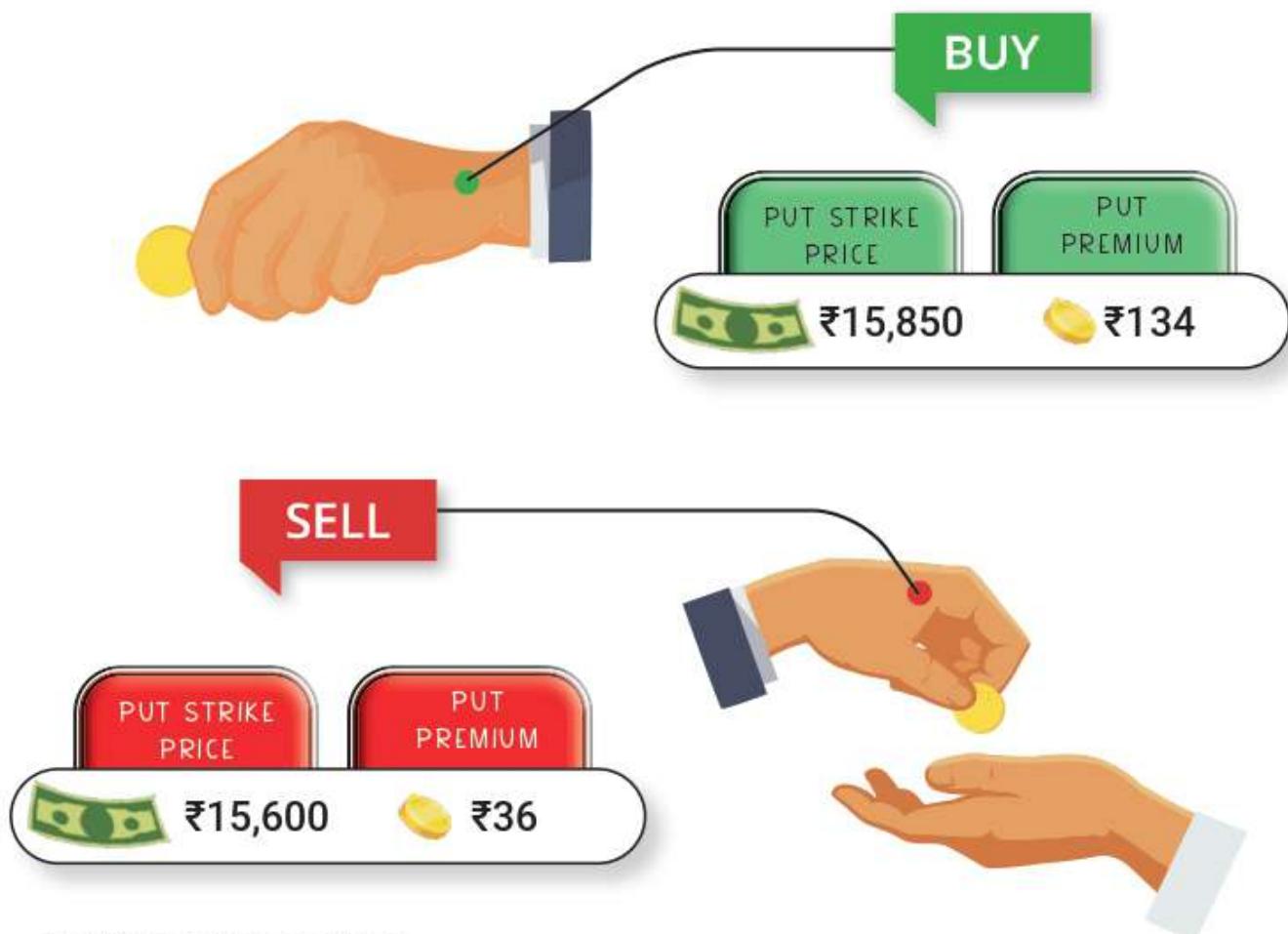


**MAXIMUM LOSS = NET PREMIUM**

**BREAK EVEN = STRIKE PRICE OF PUT PURCHASED – NET PREMIUM**

**MAXIMUM PROFIT = DIFFERENCE IN STRIKE – NET PREMIUM**

**For instance**, we buy a put option at strike price of ₹15850 for ₹134 for an asset with current market price a ₹134 and sell a put option contract for ₹36 at strike price of ₹15,600



Netting the two positions.

$$\text{COST OF THE STRATEGY} = ₹134 - ₹36 = ₹98$$

THIS IS OUR NET INVESTMENT IN THIS STRATEGY.

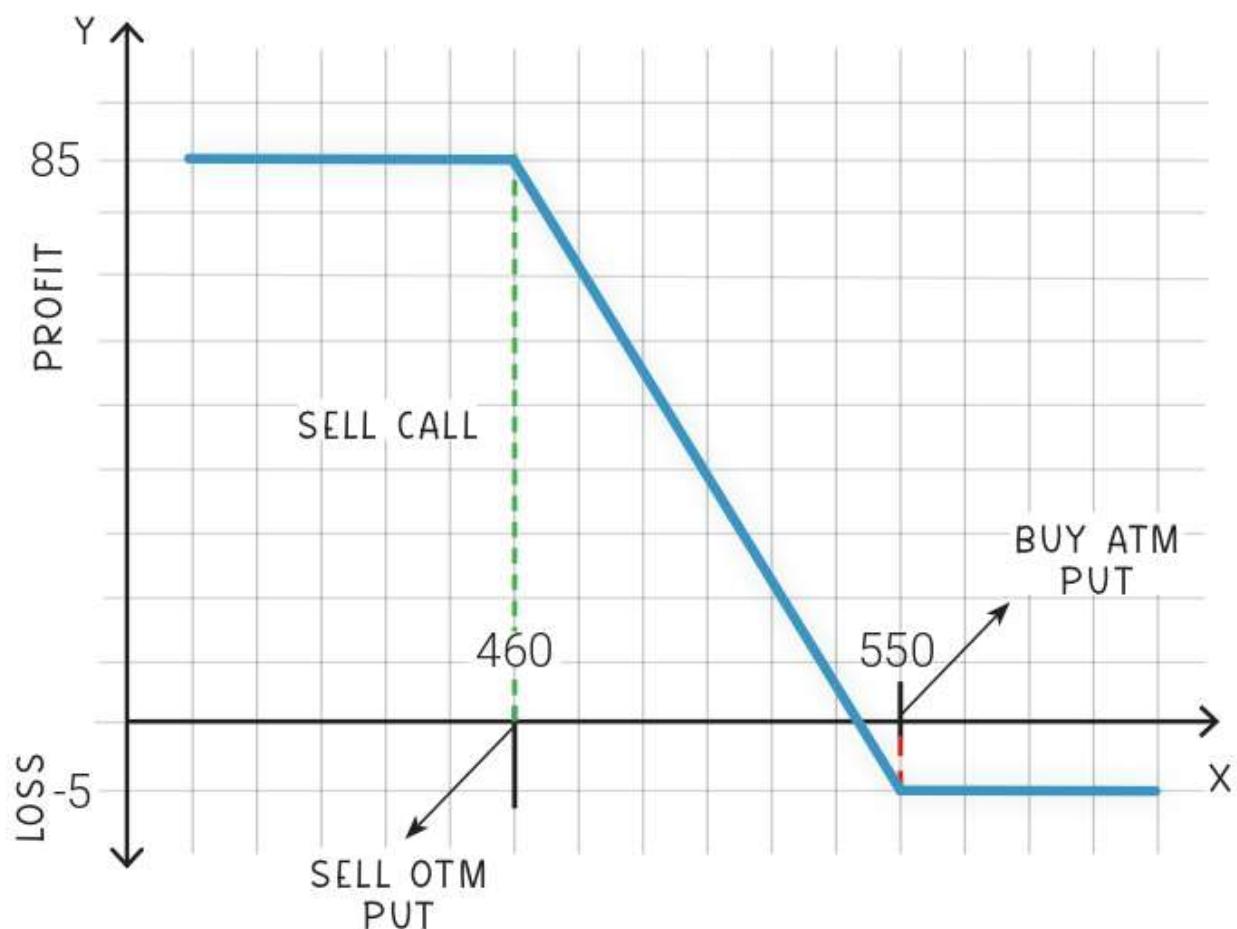
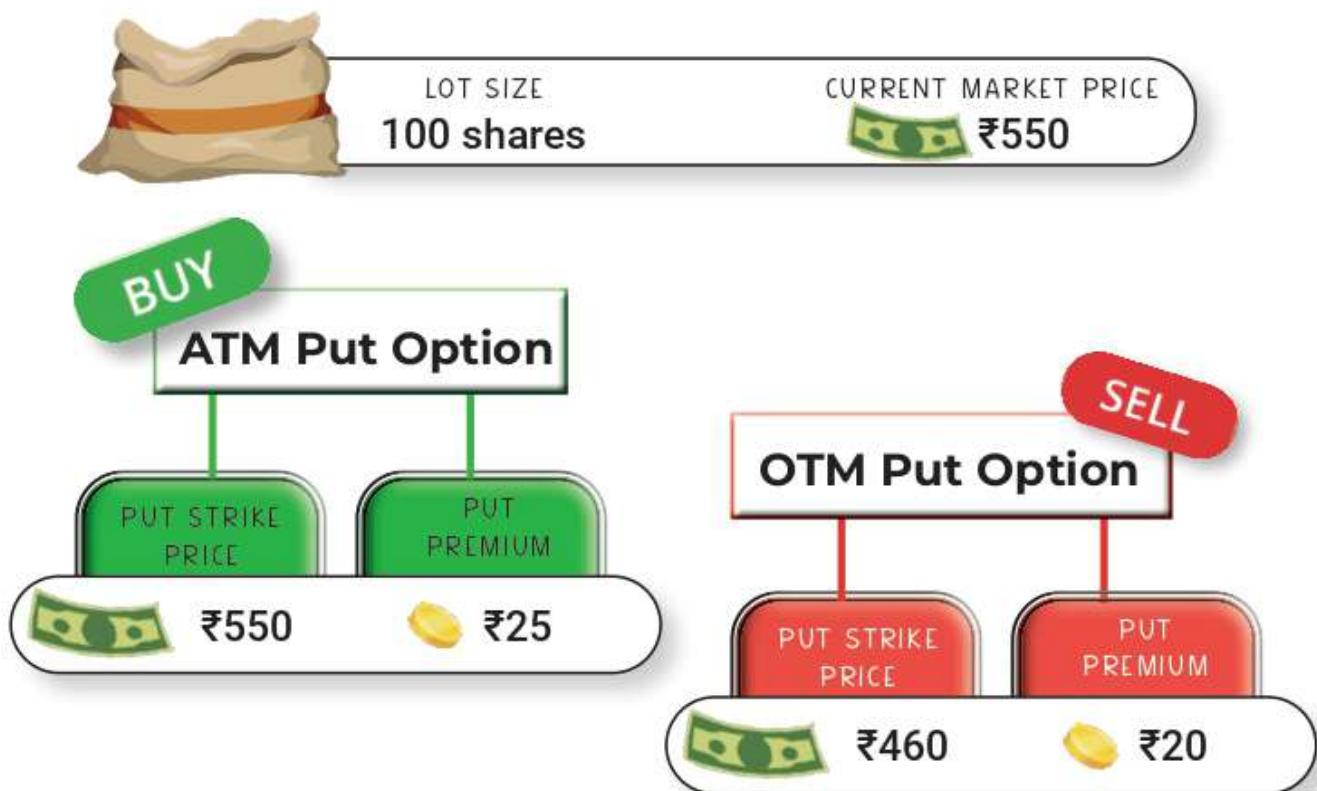
$$\begin{aligned}\text{MAXIMUM LOSS} &= \text{Net premium} \\ &= ₹98\end{aligned}$$

$$\begin{aligned}\text{BREAK EVEN POINT} &= \text{Strike price of long put} - \text{Net premium} \\ &= ₹15,850 - ₹98 = ₹15,752\end{aligned}$$

$$\begin{aligned}\text{MAXIMUM PROFIT} &= \text{Difference in Strike prices} - \text{Net Premium} \\ &= (₹15,850 - ₹15,600) - ₹98 = ₹152\end{aligned}$$

If the price is above ₹15,752, we will be incurring losses. At prices below ₹15,752, we will start making profits. But our profits will also be capped at ₹152.

Lets take a look at another example to understand this better.



Price	Buy Option 550PE	Sell Option 460PE
Price > ₹550	<input checked="" type="checkbox"/> Exercised	<input checked="" type="checkbox"/> Exercised
Price = ₹500	<input checked="" type="checkbox"/> Exercised	<input checked="" type="checkbox"/> Exercised
Price < ₹460	<input checked="" type="checkbox"/> Exercised	<input checked="" type="checkbox"/> Exercised



**NET INVESTMENT/MAXIMUM LOSS** = Net premium  
 $= ₹25 - ₹20$   
 $= ₹5$  per share



**BREAK EVEN POINT** = Strike price of long put – Net premium  
 $= ₹550 - ₹5$   
 $= ₹545$

If the price is above ₹545, we will be incurring losses. As we reach ₹545, we hit the break-even point.

At prices below ₹545, we will start making profits. But our profits will also be capped at ₹460.



**MAXIMUM PROFIT** = Difference in Strike prices - Net Premium  
 $= (₹550 - ₹460) - ₹5$   
 $= ₹85$

# 11.6 BULL PUT SPREAD STRATEGY



Explainer Video

The bull put spread strategy is more or less similar to call spread strategy. This strategy is used when we are Bullish on the underlying asset. This strategy would also limit our upside potential profit as well as losses. For this strategy, we receive a net premium instead of paying.

## STEPS TO FORM A BULL PUT STRATEGY

**BUY**

We will buy a put option that has strike price lower than the strike price of the put option that we will be selling.



**SELL**

We will sell a Put option with strike price lower than the current market price of the underlying asset. We can even sell At the money or In the money options, but that will increase our risk accordingly as well.

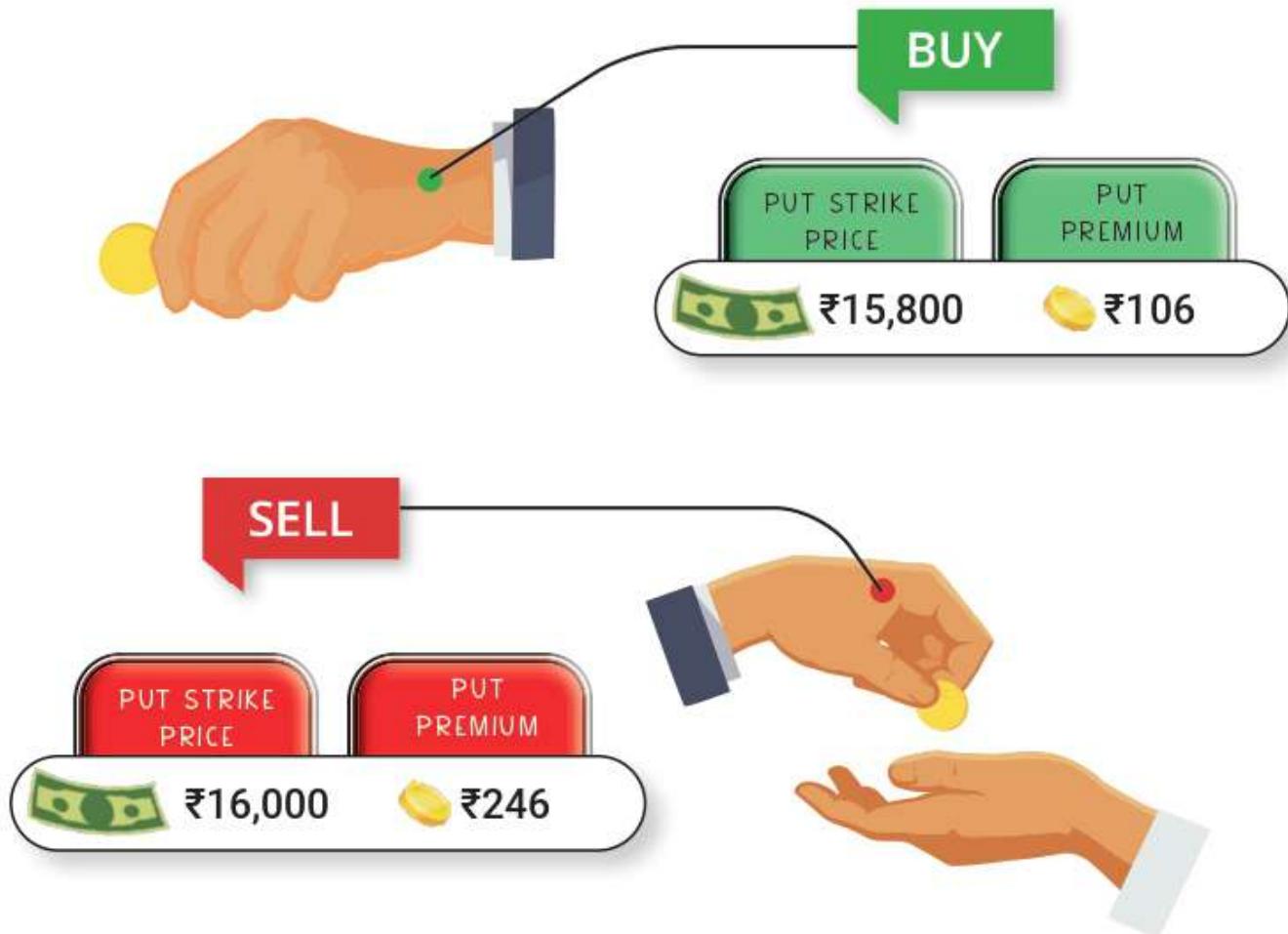


**MAXIMUM LOSS = DIFFERENCE IN STRIKE – NET PREMIUM**

**BREAKEVEN = STRIKE PRICE OF OPTION SOLD – NET PREMIUM**

**MAXIMUM PROFIT = NET PREMIUM**

**For instance**, we buy a put option at ₹15,800 at a premium of ₹106 and we sell another put option at ₹16,000 at a premium of ₹246.



**PREMIUM COLLECTED FROM THIS STRATEGY** = ₹246 – ₹106 = ₹140  
THIS IS OUR NET PROFIT IN THIS STRATEGY.

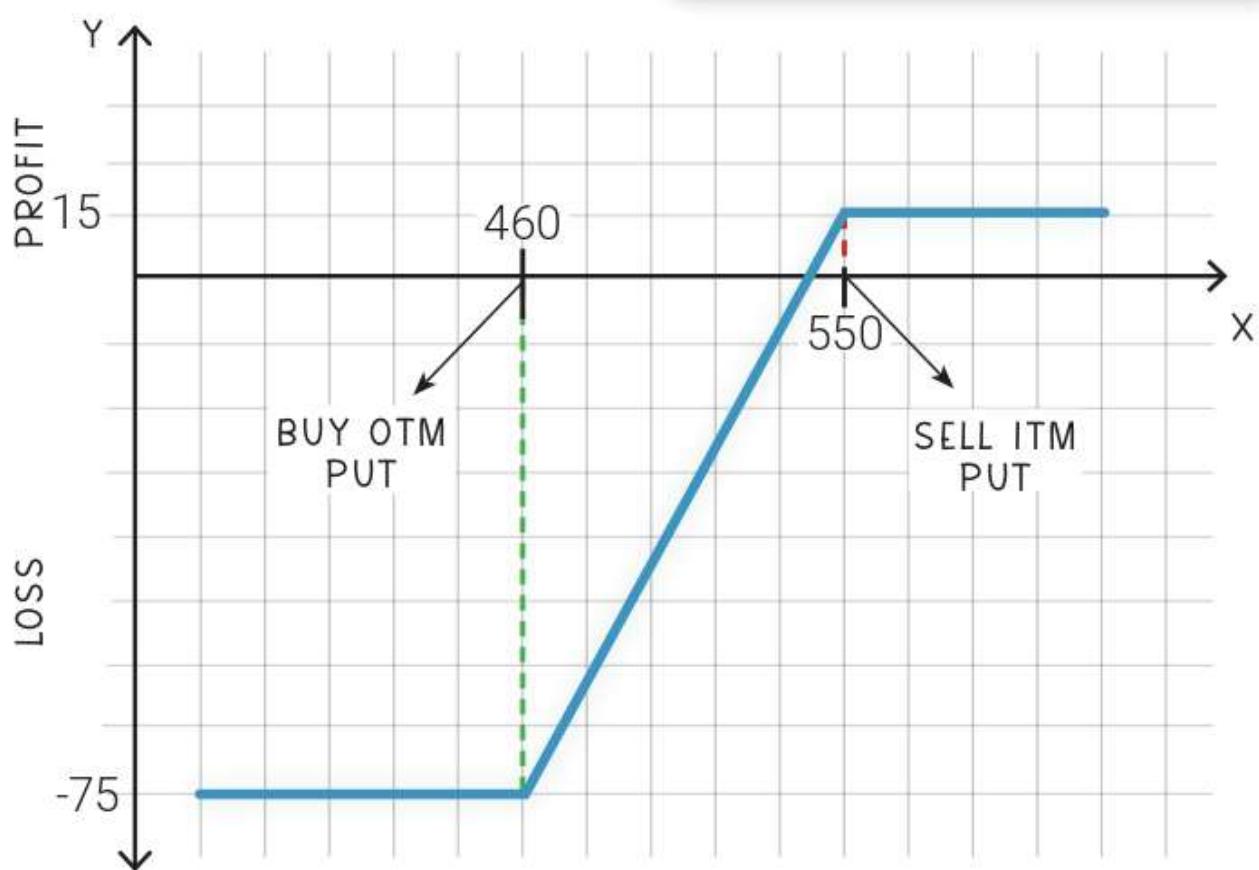
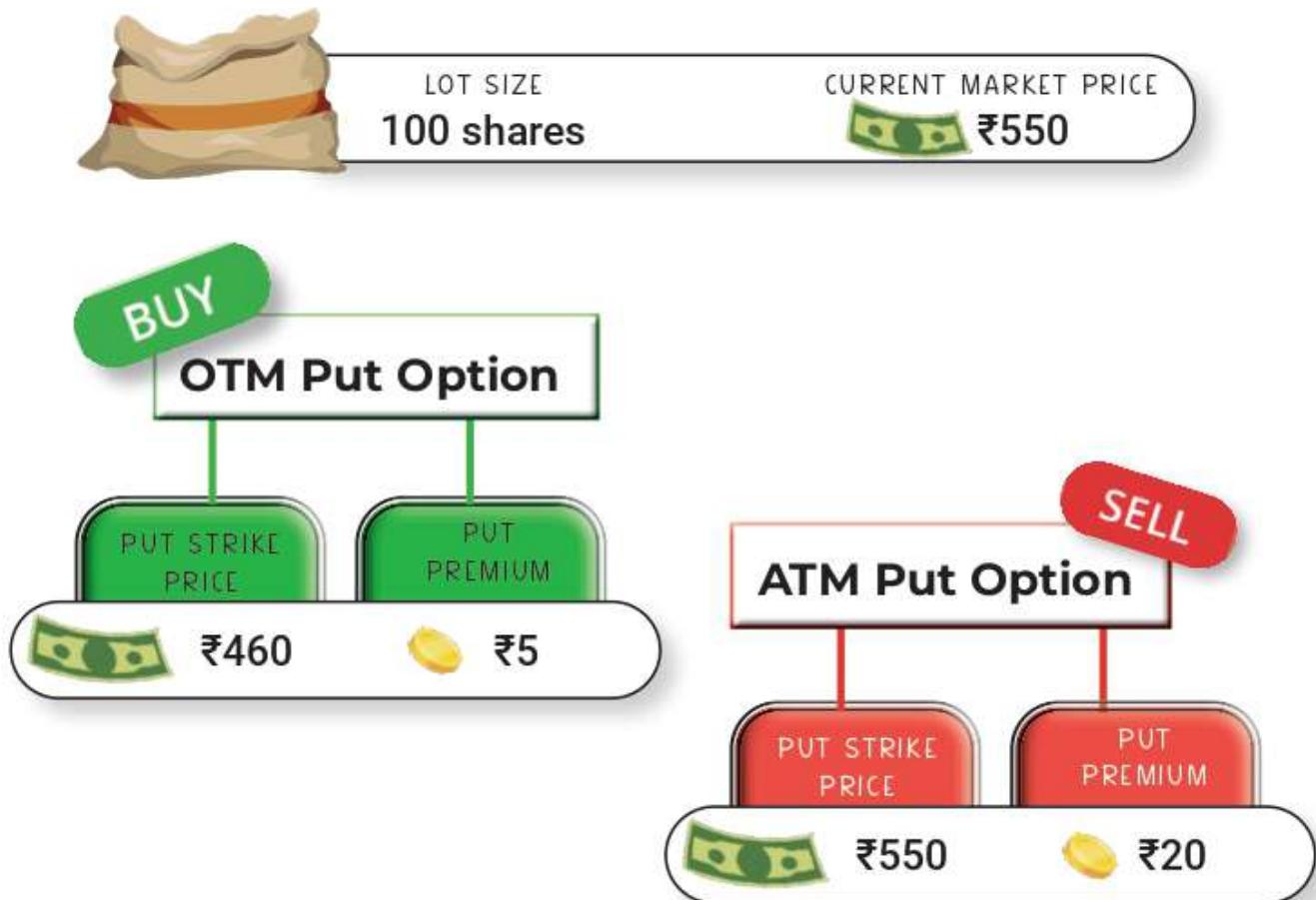
**MAXIMUM PROFIT** = Net premium  
= ₹140

**BREAK EVEN POINT** = Strike price of short put – Net premium  
= ₹16,000 – ₹140 = ₹15,860

**MAXIMUM LOSS** = Difference in Strike prices - Net Premium  
= (₹16,000 – ₹15,800) – ₹140 = ₹60

If the price is above ₹16,000 or at ₹16,000, we will have profits. And if the prices go below ₹15,860, we will start incurring losses. But our losses will also be capped.

Lets take a look at another example to understand this better.



Price	Buy Option 460PE	Sell Option 550PE
Price > ₹600	✗ Exercised	✗ Exercised
Price = ₹500	✗ Exercised	✓ Exercised
Price < ₹460	✓ Exercised	✓ Exercised



**MAXIMUM LOSS** = Difference in Strike prices - Net Premium  
 $= (\text{₹}550 - \text{₹}460) - \text{₹}15$   
 $= \text{₹}75$



**BREAK EVEN POINT** = Strike price of short put – Net premium  
 $= \text{₹}550 - \text{₹}15$   
 $= \text{₹}535$

If the price is above ₹550, we will be making profits. As we reach ₹535, we hit the break-even point.

At prices below ₹535, we will start incurring losses. But our losses will also be limited to ₹75.



**NET INFLOW/MAXIMUM PROFIT** = Net premium  
 $= \text{₹}30 - \text{₹}15$   
 $= \text{₹}15$  per share

With this we have understood all kinds of Spread strategies. We can make it even more complicated by increasing number of option contracts involved. You can experiment with different strike prices and difference in the strike prices and work on creating trading strategies on your own. Next, we will move on to understand Strangle.

## 11.7 STRANGLE STRATEGY



Explainer Video

Strangle strategies are quite similar to straddle strategies. The only difference is that in a straddle strategy, we buy/sell two options at the same strike price. While in a strangle strategy, we buy/sell two options at different strike prices.

### STRADDLE STRATEGY



### STRANGLE STRATEGY



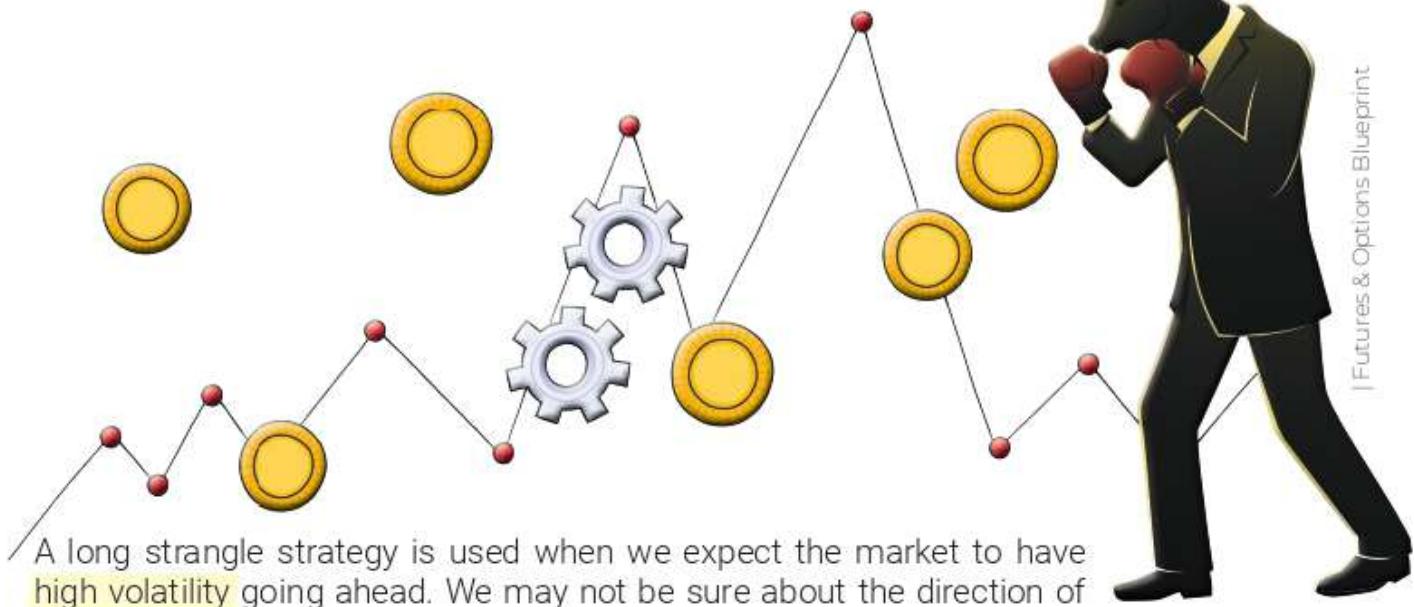
We have two kinds of option strangle strategy. One is Long Strangle Strategy and the position opposite to it is Short Strangle Strategy.

### LONG STRANGLE STRATEGY



### SHORT STRANGLE STRATEGY

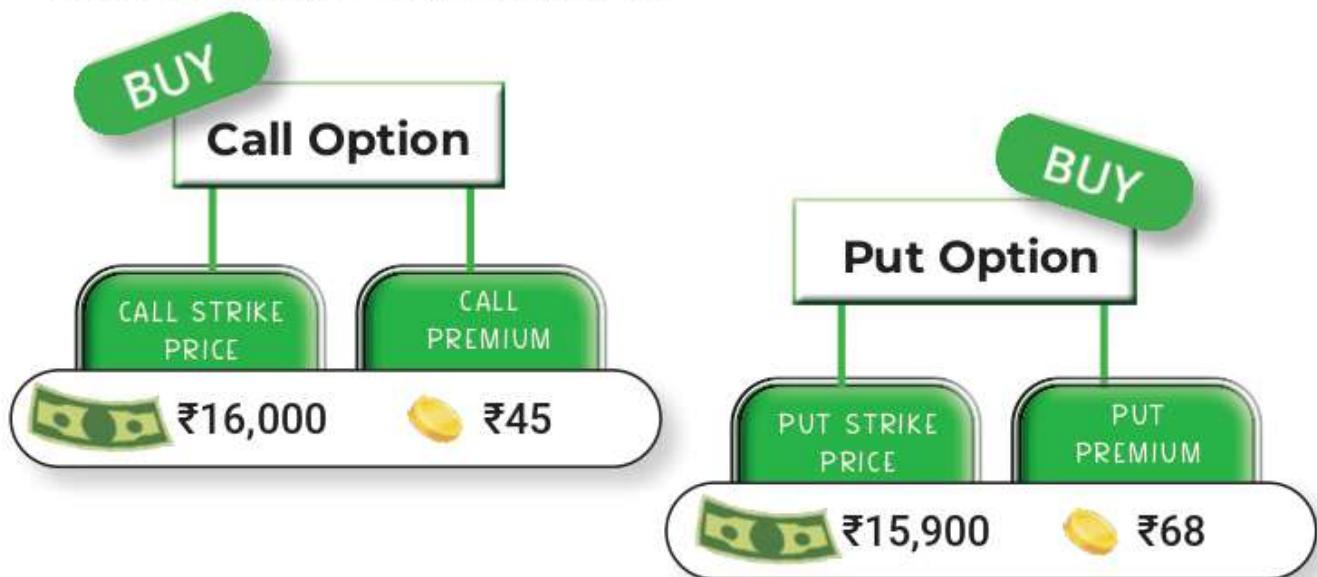
## LONG STRANGLE STRATEGY



A long strangle strategy is used when we expect the market to have high volatility going ahead. We may not be sure about the direction of the market prices but expect high volatility. We buy both call and put options at different strike prices on the same underlying asset. With this strategy, we have **LIMITED LOSSES** and enjoy **UNLIMITED PROFIT POTENTIAL**. Also, as a long position holder, we have a low margin requirement.

**For instance,**

we buy a call at a strike price of ₹16,000 at a premium of ₹45 and a put option at a strike price of ₹15,900 at a premium of 68.

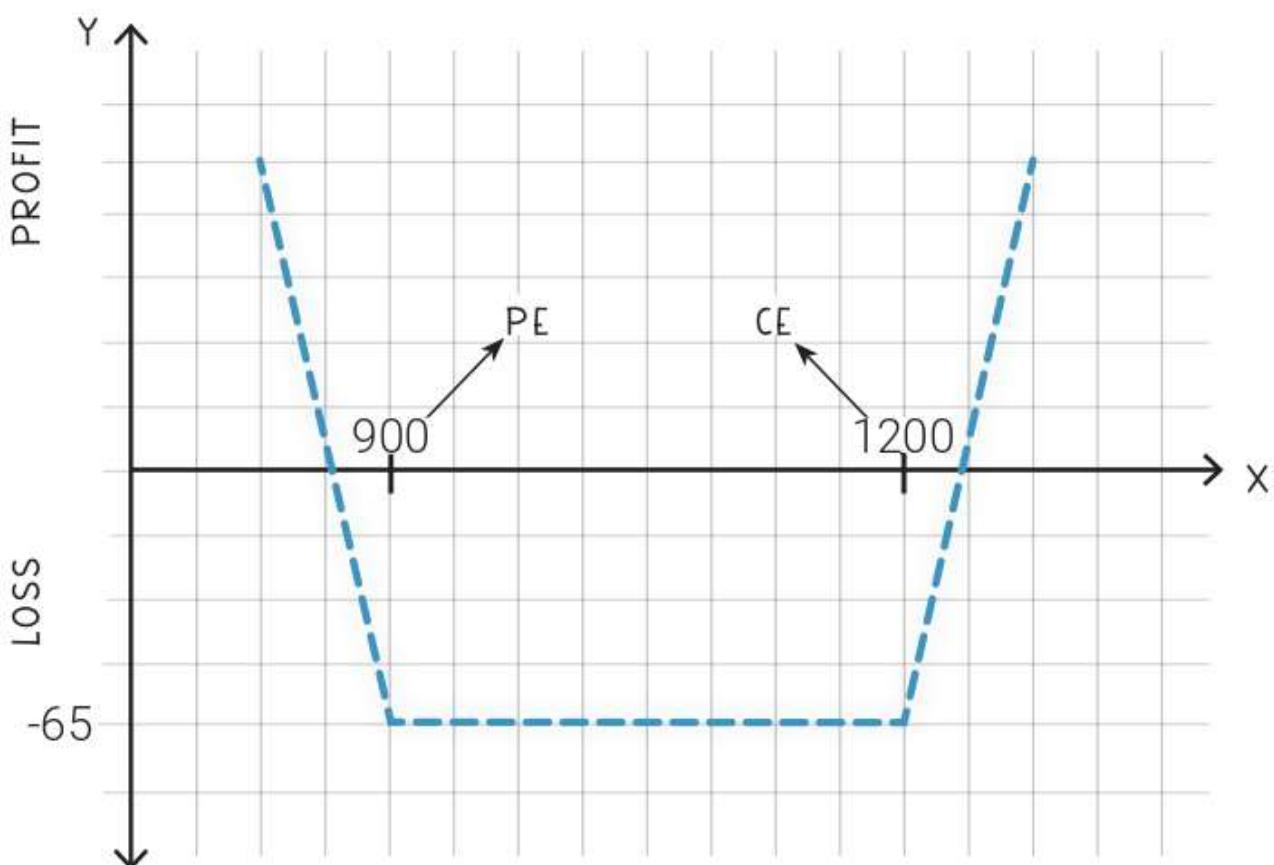
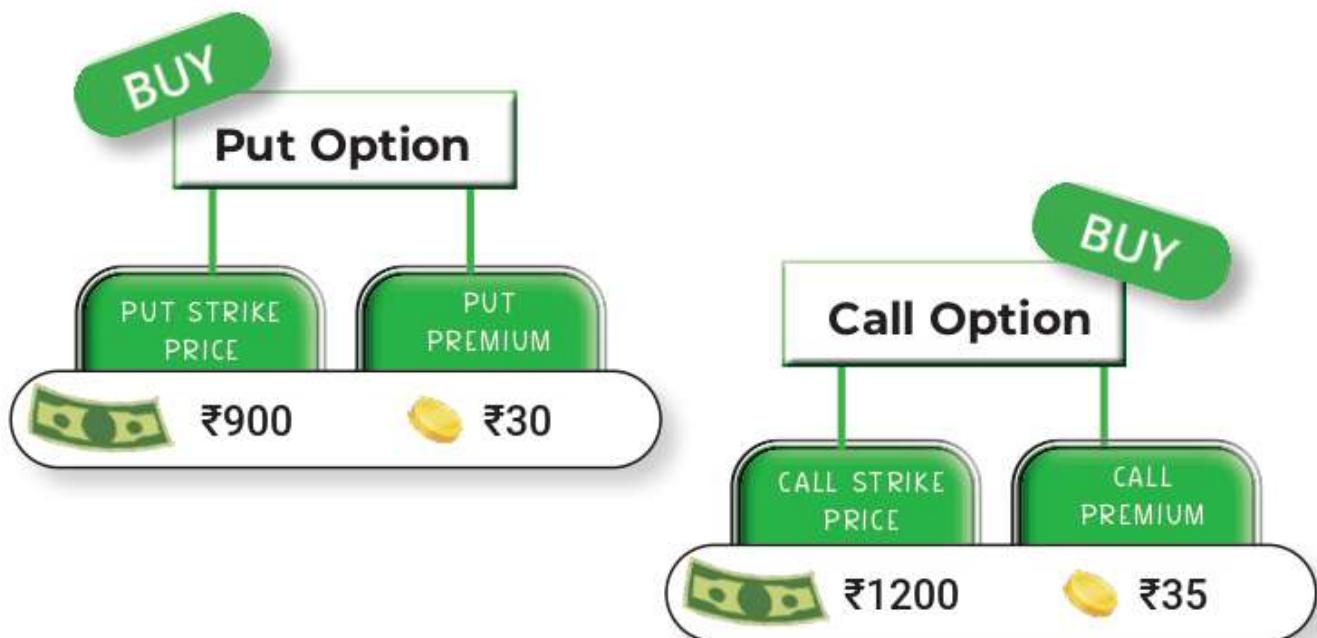


$$\text{MAXIMUM LOSS} = ₹45 + ₹68 = ₹113$$

While we still enjoy **UNLIMITED PROFIT POTENTIAL** when the volatility is high.

Let's take another example and calculate payoffs from this strategy.

On a stock XYZ at CMP = ₹1000, we buy a put option at a strike price of ₹900 at a premium of ₹30 per share. And a call option at a strike price of ₹1200 at a premium of ₹35. Lot Size = 100.



Price	Put Option	Call Option
Price = ₹800	✓ Exercised	✗ Exercised
Price = ₹950	✗ Exercised	✗ Exercised
Price = ₹1300	✗ Exercised	✓ Exercised



$$\text{MAXIMUM LOSS} = ₹30 + ₹35 \\ = ₹65$$

When the price stays between ₹900 to ₹1200, we have losses. As we move ahead of either of these two points (₹900 and ₹1200), we start to recover our losses.



On the downside,

$$\text{BREAK EVEN POINT} = ₹900 - ₹65 \\ = ₹835$$

On the upside,

$$\text{BREAK EVEN POINT} = ₹1200 + ₹65 \\ = ₹1265$$



### PROFITS

So, if the price goes below ₹835, we can have profits. Alternatively, if the price goes above ₹1265, we have profits.  
This is why we want high volatility while we execute this strategy to make profits.

Higher the volatility, higher is the profit potential with this strategy.

## SHORT STRANGLE STRATEGY

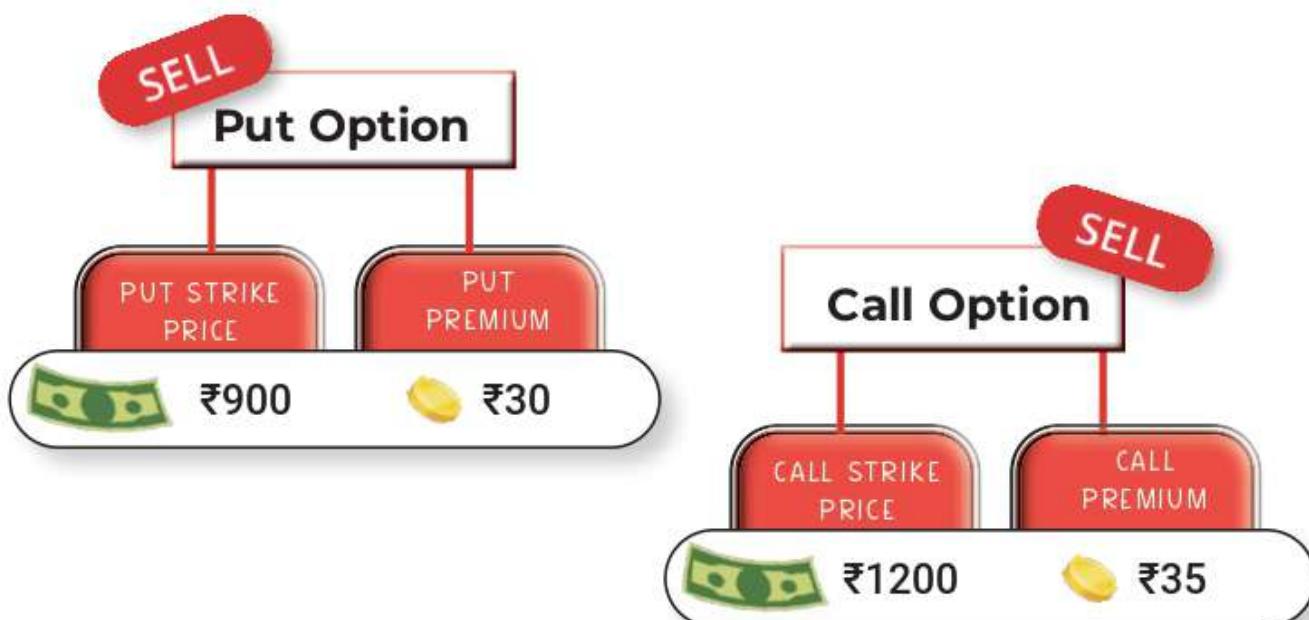


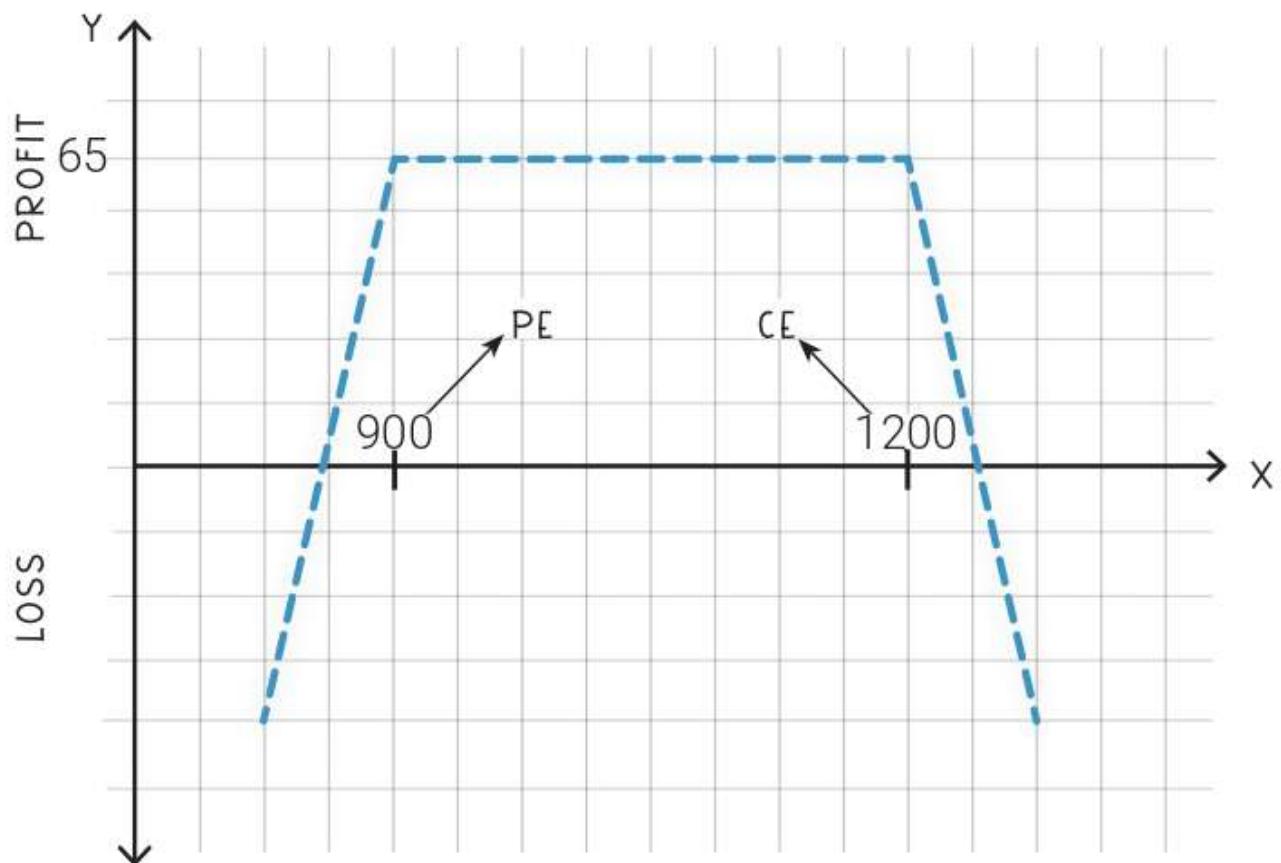
A Short strangle strategy is used when we expect low volatility in the market. The direction is not important till the time the movements in the market are limited. We sell both call and put options at different strike prices on the same underlying asset. With this strategy, we have **LIMITED PROFITS** with **UNLIMITED LOSS POTENTIAL**. Also, as a short position holder, we have a high margin requirement.

Let's take an example and calculate payoffs from this strategy.

On a stock XYZ at CMP = ₹1000, we sell a put option at a strike price of ₹900 at a premium of ₹30 per share. And sell a call option at a strike price of ₹1200 at a premium of ₹35. Lot Size = 100.

**Note that we are receiving premium this time.**





Price	Put Option	Call Option
Price = ₹800	✓ Exercised	✗ Exercised
Price = ₹950	✗ Exercised	✗ Exercised
Price = ₹1300	✗ Exercised	✓ Exercised



When the price stays between ₹900 to ₹1200, we enjoy profits.

As we move ahead of either of these two points (₹900 and ₹1200), our profits start to reduce.



On the downside,

$$\begin{aligned}\text{BREAK EVEN POINT} &= ₹900 - ₹65 \\ &= ₹835\end{aligned}$$

On the upside,

$$\begin{aligned}\text{BREAK EVEN POINT} &= ₹1200 + ₹65 \\ &= ₹1265\end{aligned}$$

So, if the price goes below ₹835, we will have losses. Alternatively, if the price goes above ₹1265, we will have losses.



### LOSS

As we move ahead of either of these two points (₹900 and ₹1200), we start to incur losses.

Our profits are capped at ₹65, while we may incur unlimited losses if the markets turn out to be highly volatile.

This is why we want low volatility while executing this strategy.

Use the option chain of NSE to practice and get more familiarized with all these strategies that we have been discussing. Try creating payoffs and graphs independently. Getting comfortable with all these strategies is particularly important when you start working on creating your own strategies.

# 11.8 BUTTERFLY SPREAD STRATEGY



Explainer Video

A butterfly spread is a relatively more complex trading strategy that involves use of two option spreads together. It may take time to get comfortable with them initially.

In a butterfly strategy, we use any two spreads.

**For instance,**



An important thing to note here that the combination of two spreads always has a common option type. This means that the two spreads combined will be **either call or put**. Different options are not used. The expiry of all the options is same and they all have the same underlying asset.

Butterfly spread is created by buying a call option, selling two call option of a higher strike price and then buying another call option of even higher strike price. The same can even be done with put options as well as taking the opposite side of these trades. We will understand about different types of butterfly spreads shortly.

The steps involved in creating these are:

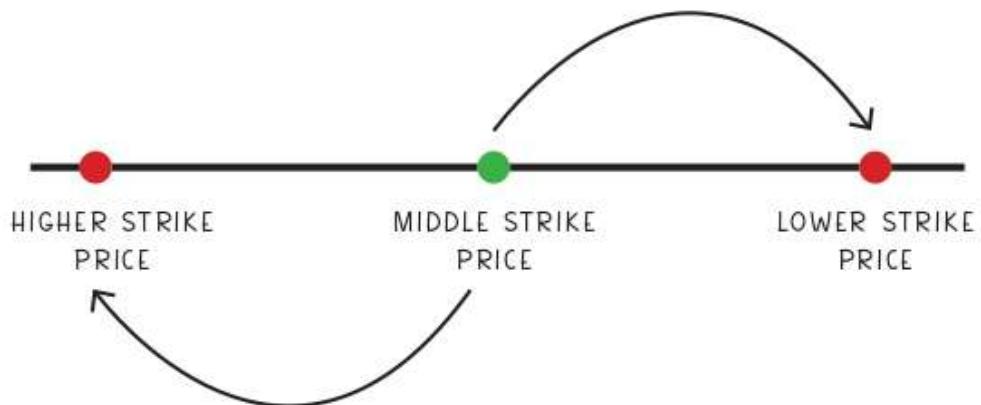


We can even take opposite ends of this trade.

## RULE:

$$\text{Lower strike price} - \text{Middle strike price} = \text{Higher strike price} - \text{Middle strike price}$$

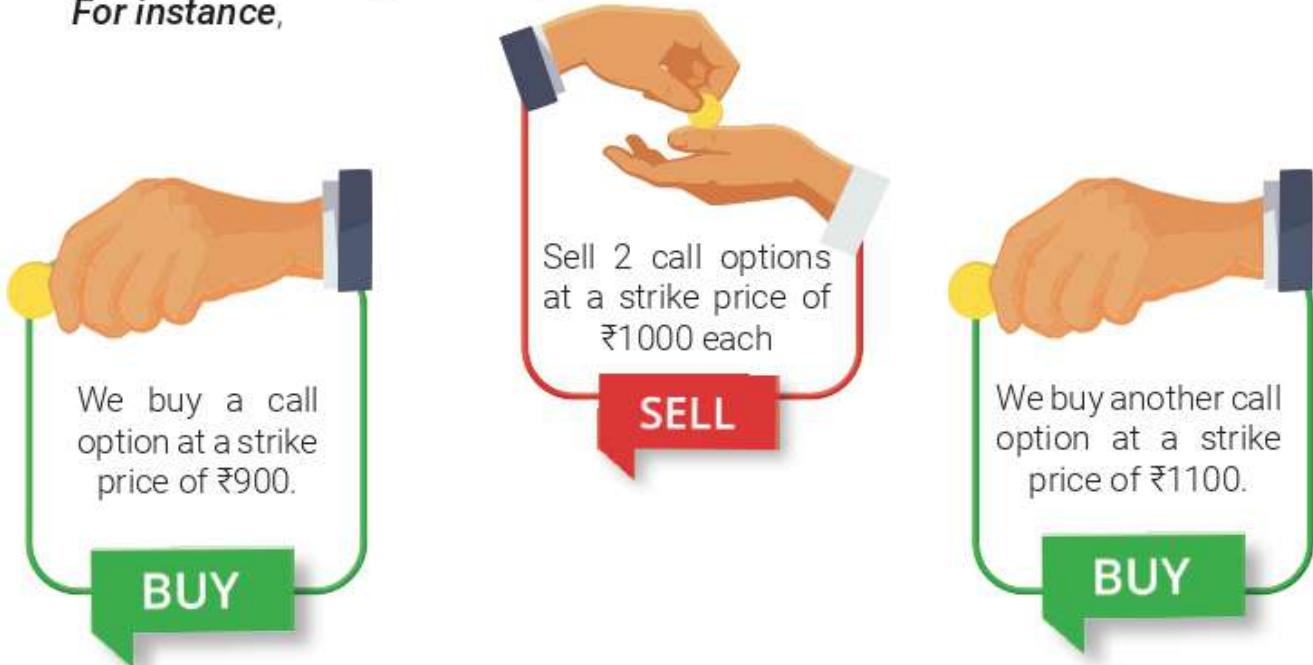
This means that the difference between the higher strike price and middle strike price will be same as the difference between the middle strike price and lower strike price.



## LONG CALL BUTTERFLY

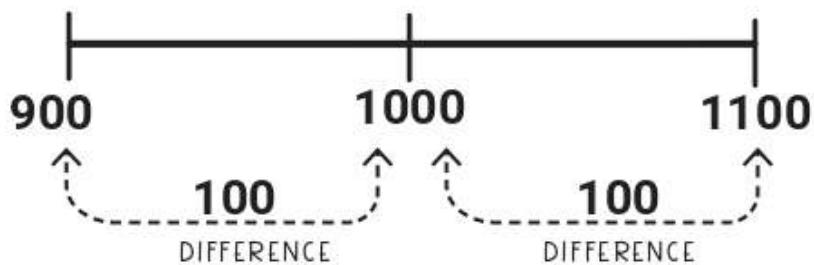
This particular type of butterfly strategy is called Long Call Butterfly. Here, we buy a call option, sell two call options at a higher strike price and then buy another call option at an even higher strike price

*For instance,*

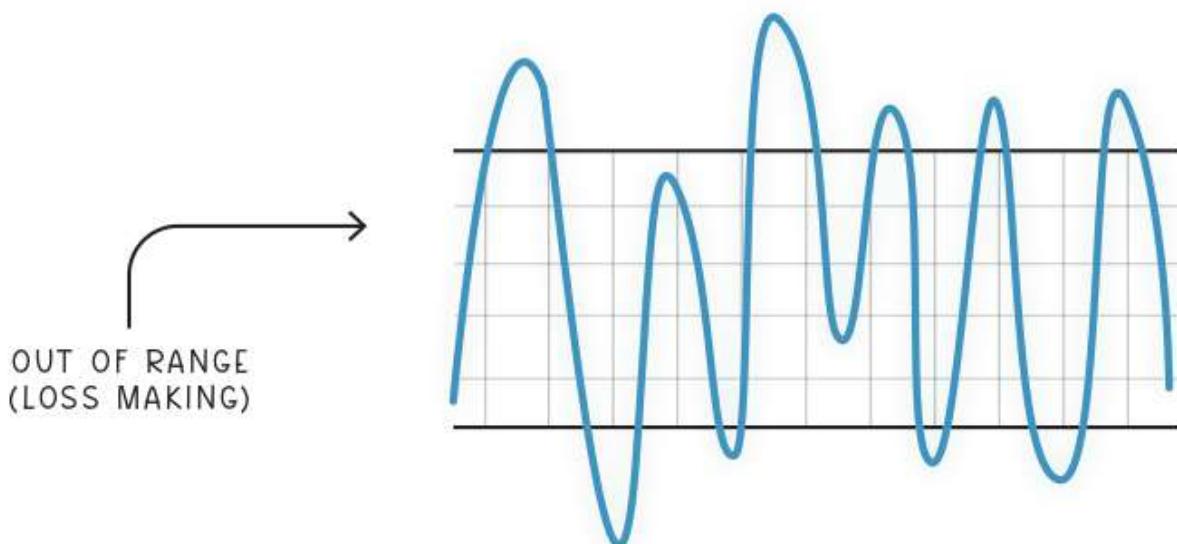
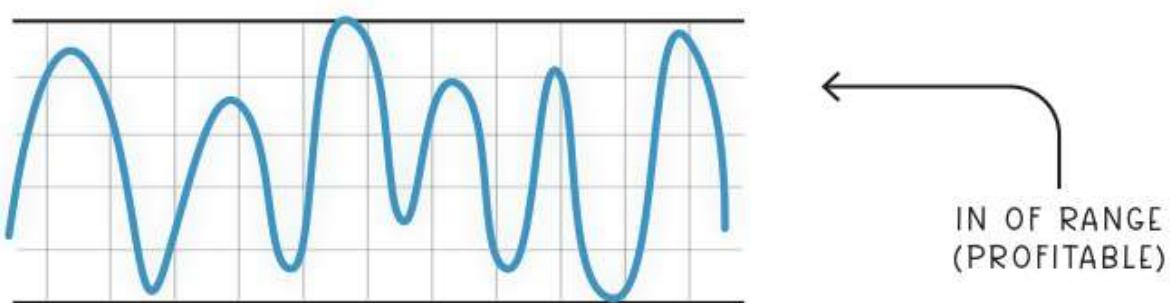


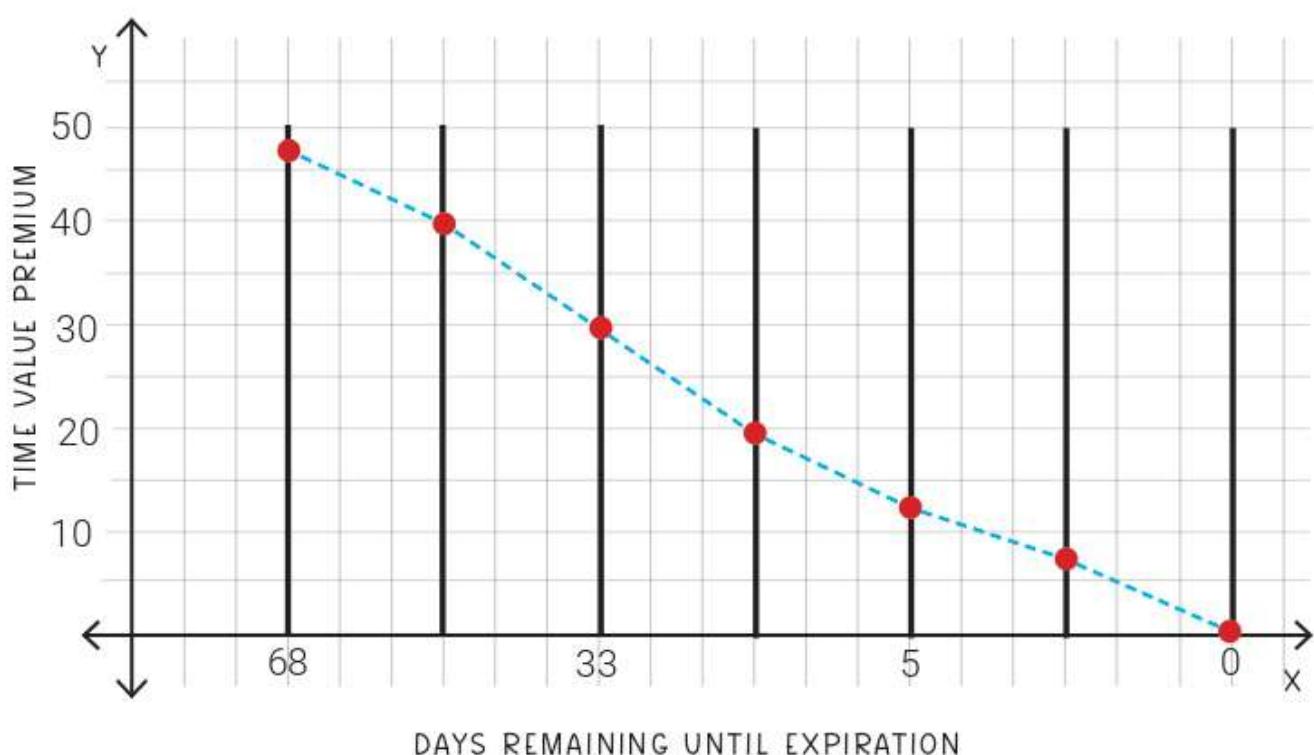
This butterfly spread is a combination of a Bull call spread and a Bear call spread. Such a strategy leads to net outflow of premium.

**Note that the ratio of 1:2:1 is maintained as 1 Long: 2 Short: 1 Long.**



In a Long Call butterfly, we are again trading based on volatility. If the price of the underlying on expiry is between the two extreme strike prices, we would profit and if it is outside the range, then we would incur losses to the extent of premium paid by us. Here, we need the price to be as close to the middle strike price for us to profit.





We mainly profit from a decreasing volatility or with time decay i.e., due to passage of time. As time passes, the risk of large moves starts to decrease and as a result, the price of the premium also starts to decrease.

This strategy is called **Bull Butterfly** or **Long Call Butterfly**. We'll be discussing Long Call Butterfly with an example shortly. The net premium here will be an outflow. In this strategy we have a limited loss and a limited profit scenario. This means we have defined risk and rewards.

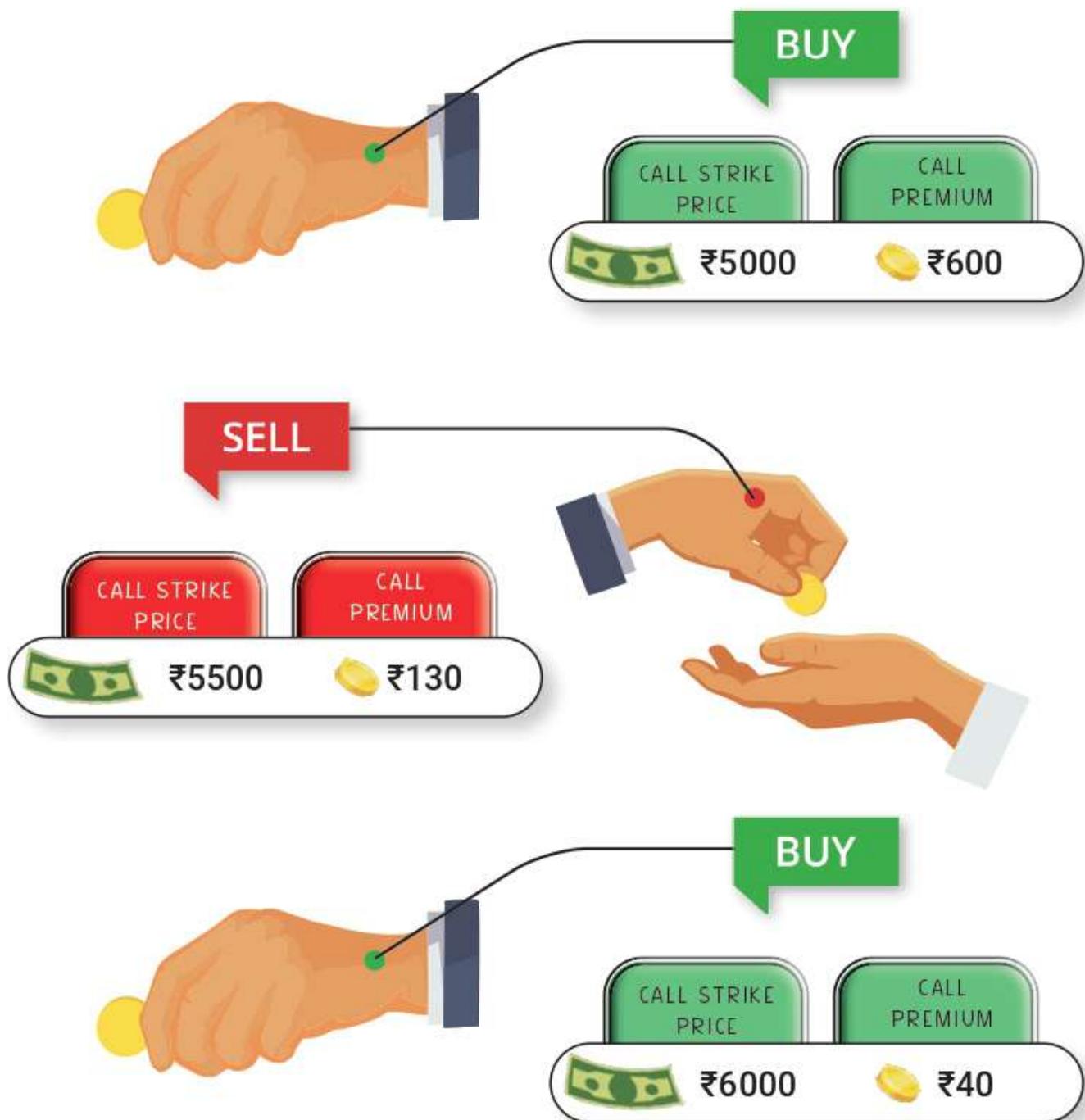


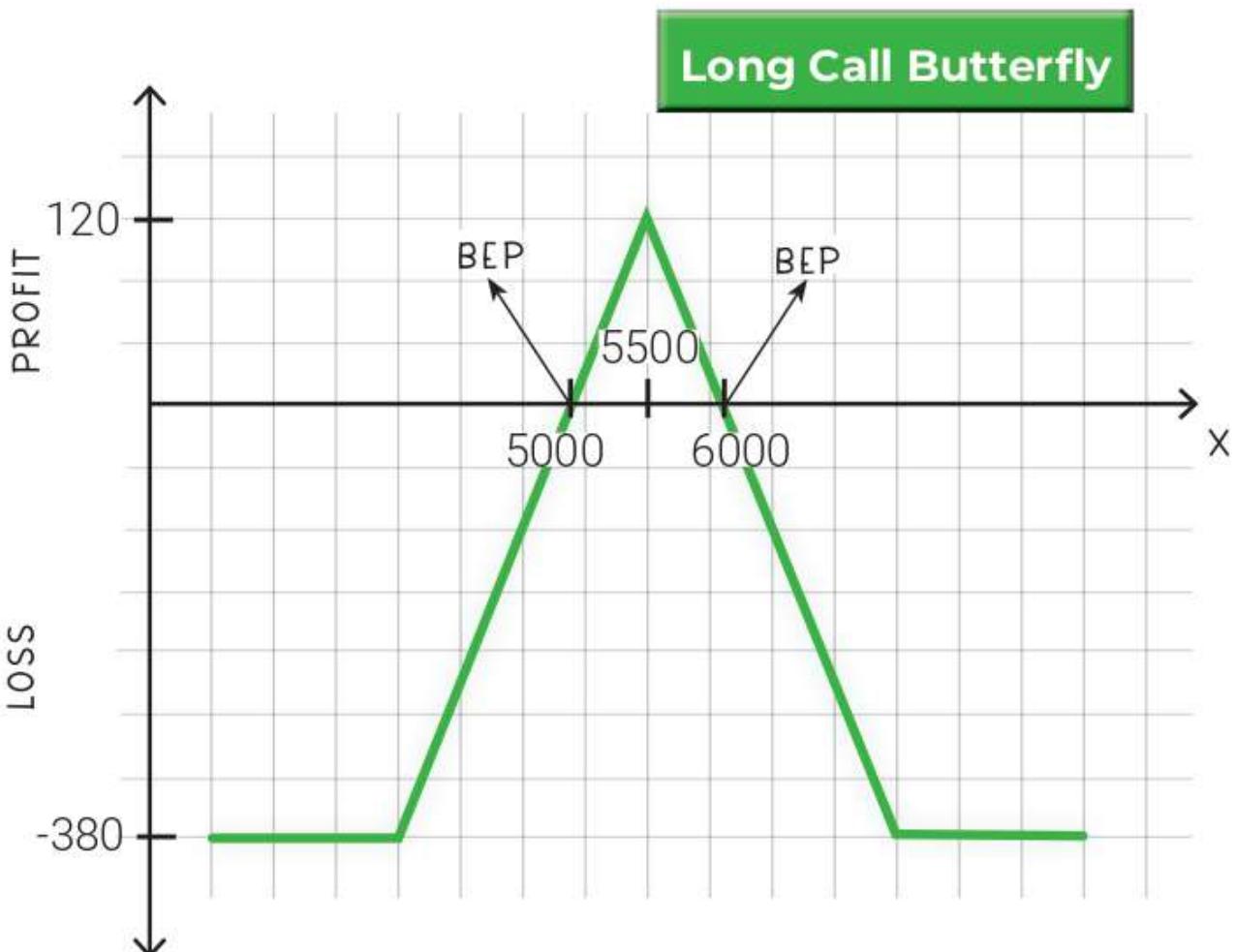
Lets take an example and calculate these numbers for Long Call Butterfly strategy as well as Short Call Butterfly strategy. It will help us understand the payoff, risks and reward better. Once we understand butterfly strategies for call options, you may go ahead and create for put option strategies too.

**Suppose,**

A stock is trading at ₹5500. Lot Size = 100.

We buy 1 call at a strike price of ₹5000 at a premium of ₹600. We sell 2 calls at a strike price of ₹5500 at a premium of ₹130. We buy 1 call at a strike price of ₹6000 at a premium of ₹40.





#### MAXIMUM LOSS/ NET PREMIUM/ NET DEBIT/ NET INVESTMENT

$$\begin{aligned}
 &= ₹600 - ₹260 + ₹40 \\
 &= ₹380
 \end{aligned}$$

At price ₹5000 or below ₹5000, all the 4 options are invaluable i.e., no payoff. And our loss will be fixed at ₹380.

Beyond ₹5000, say at ₹5020, our losses will be reduced with the payoff we get from the first call that we bought at ₹5000. So, at ₹5020 our losses will be

$$\begin{aligned}
 &= ₹380 - ₹20 \\
 &= ₹360
 \end{aligned}$$



On the upside,

$$\begin{aligned}\text{BREAK EVEN POINT} &= ₹5000 + ₹380 \\ &= ₹5380\end{aligned}$$

So, as we move ahead, at ₹5380 we hit the Break-even point. We are at a No profit No loss position. Beyond this point, we start to make profits.

On the downside,

$$\begin{aligned}\text{BREAK EVEN POINT} &= ₹6000 - ₹380 \\ &= ₹5620\end{aligned}$$

At ₹5620, again, we hit the break-even point. Beyond this point, we again start to make losses. As we reach ₹6000 price, our losses are capped at the maximum loss amount of ₹380. Our losses are from 2 calls sold.

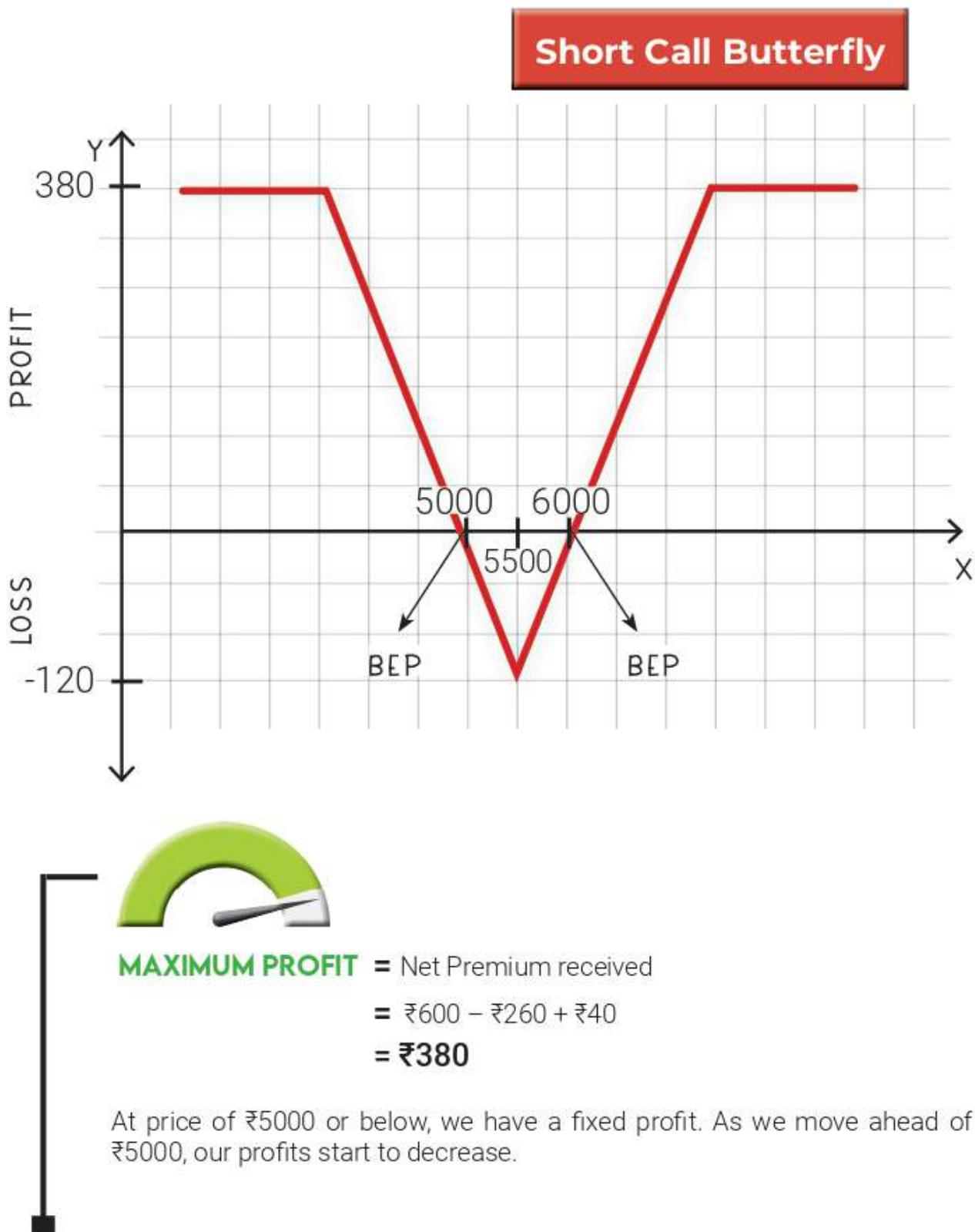


$$\begin{aligned}\text{MAXIMUM PROFIT} &= ₹500 - ₹380 \\ &= ₹120\end{aligned}$$

Moving on, as the price goes up, our profits start to reduce. As a 2 options seller, we make losses as we meet our obligation, and the profits are significantly reduced.

For a short call butterfly, our payoff is exact opposite.

**For instance**, we would be selling 1 call at ₹5000. Buying 2 calls at ₹5500 and selling 1 more call at ₹6000. The chart is the exact mirror image of a long call butterfly graph.





On the upside,

$$\begin{aligned}\text{BREAK EVEN POINT} &= ₹5000 + ₹380 \\ &= ₹5380\end{aligned}$$

We hit break-even at ₹5380 and beyond this we start to make losses.

On the downside,

$$\begin{aligned}\text{BREAK EVEN POINT} &= ₹6000 - ₹380 \\ &= ₹5620\end{aligned}$$

At ₹5620, again, we hit the break-even point and after this we start to make profits again. At ₹6000, our maximum profit is reached and beyond this we make a fixed profit only.



$$\begin{aligned}\text{MAXIMUM LOSS} &= ₹500 - ₹380 \\ &= ₹120\end{aligned}$$

At ₹5500 point, we have our maximum loss. After that, our losses will decrease.

We can see that Long Call Butterfly and Short call butterfly are opposite sides of exact same trade. This means the payoffs for the two are exact opposite to each other.

Similarly, we can make payoff charts for Long Put and Short Put Butterfly strategy. Try doing that.

Also, now that you have understood quite a few strategies, you should take out time and experiment with your own strategies. Remember, there are no rules. You can be as creative as you want. Take any and every possible variation, different underlying assets and see what works for you. Create payoff charts for each of them and then judge which are the ones that work and which are the ones that do not. Understand which strategies work in which scenarios. The fundamental still remains same :



Creating good strategies is where most traders spend most of their time. Once you get comfortable with options and different common strategies, experiment as much as you can. Also, remember creating strategies is not a 1-2 day job. It may take months for one strategy of yours to work. It may take few years and losses before you figure out what works for you. So, make sure you never risk your survival. Keep in mind that we are dealing with derivatives which are highly leveraged instruments. Use Risk Management principles very properly. Avoid unlimited loss potential as much as possible.

Now, its your time to be creative and start testing out different strategies that you may think of. And have patience because its going to really test it.

# 11.9 THINGS TO KEEP IN MIND BEFORE ENTERING F&O MARKET!

Derivatives are known as weapons of the market or the weapons of mass destruction. Warren Buffet gave that name to them for a reason. We need to be extremely cautious while we use them. It is advisable that we paper trade, understand the markets properly, learn thoroughly and then get into the real markets. This market is brutally competitive.

We must know the returns we get from F&O are much higher than what we get from a cash market. But higher returns come with higher risks.

IN THE F&O MARKET, OUR LOSSES ARE NOT LIMITED TO OUR CAPITAL. WE MAY END UP LOSING FAR MORE THAN WHAT WE OWN AND LITERALLY OVERNIGHT.

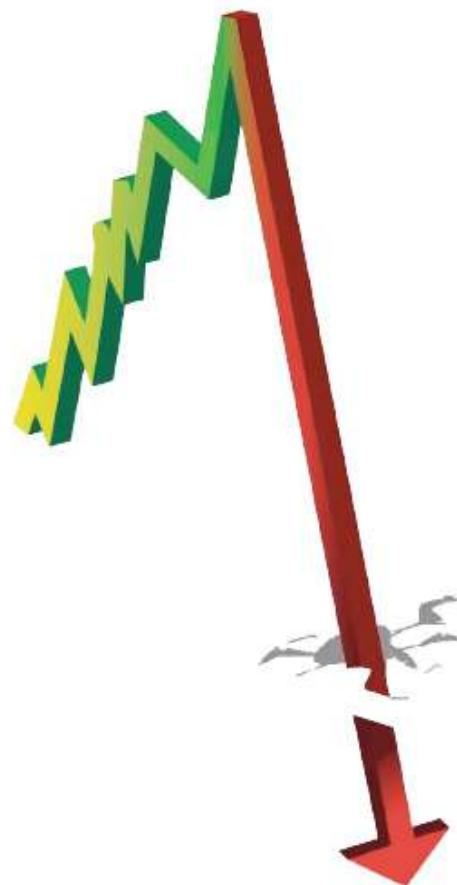
In the cash market, the worst-case scenario is that we lose all our money. However, in the F&O market, there's no limit to our losses. It is advisable that we avoid unlimited losses positions while we are just entering the markets. Otherwise also, it is advisable to avoid infinite losses as much as possible.

With derivatives, our capital may erode in a really short period of time. One must be very sure of their risk profile before entering into the F&O markets. Ensure proper backtesting and understanding of the strategies before entering the market. Risk Management steps should be followed and sworn by as we plan to take our steps into the F&O market. We can't emphasize enough on this.

Make sure that you never put yourself in a position where you may lose more than what you own.



BIZZARE THINGS HAPPEN IN FINANCIAL MARKETS. MAKE SURE YOUR RISKS ARE WELL MANAGED.



# Notes

# Notes

## **CHAPTER 12**

# **RISK MANAGEMENT**

- 12.1 Introduction**
- 12.2 Risk management techniques**
- 12.3 Conclusion**



## 12.1 INTRODUCTION

Given the risk involved in entering the F&O markets it is crucial to understand proper risk management measures. We must keep them in mind as we move ahead in the markets. Risk Management is the core of any good trading strategy. A strategy that does not take care of risk management, will eventually suffer one day and is not sustainable. Particularly, with Futures and Options market, it is even more important as high leverage is used. We do not want to risk our survival under any circumstances in any trading position. We do not want to be in a position ever where there is even a slight possibility that we might lose more than what we have.

Even though a trade might look incredibly attractive, if there is a slight chance that you might lose everything and more, we must not enter such trades. As we are new to these markets and have limited exposure, getting into such trades can be extremely dangerous. Small losses may occur but a potential big loss that can leave us out of the market must be avoided under all circumstances.

There are countless stories where a strategy has an extremely unlikely risk but its a risk where survival is compromised. Such strategies might end up doing extremely good for 5-6 years and all of a sudden in 1 or 2 event, may leave the trader bankrupt and may take them back to where it started or even worse.

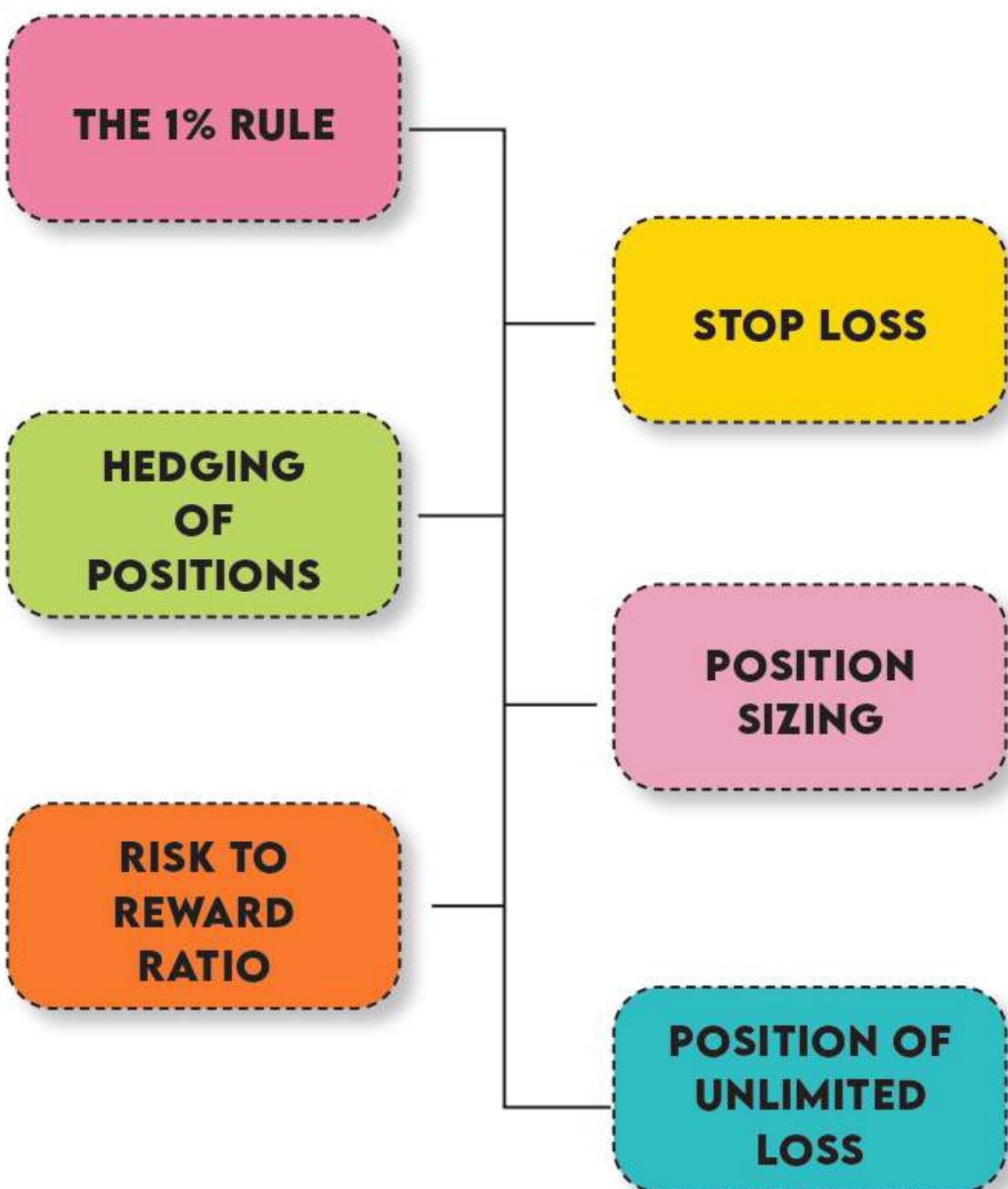


Risk Management has a cost to it. While we apply risk management tools to avoid unwanted risk, it may even limit our profits significantly.

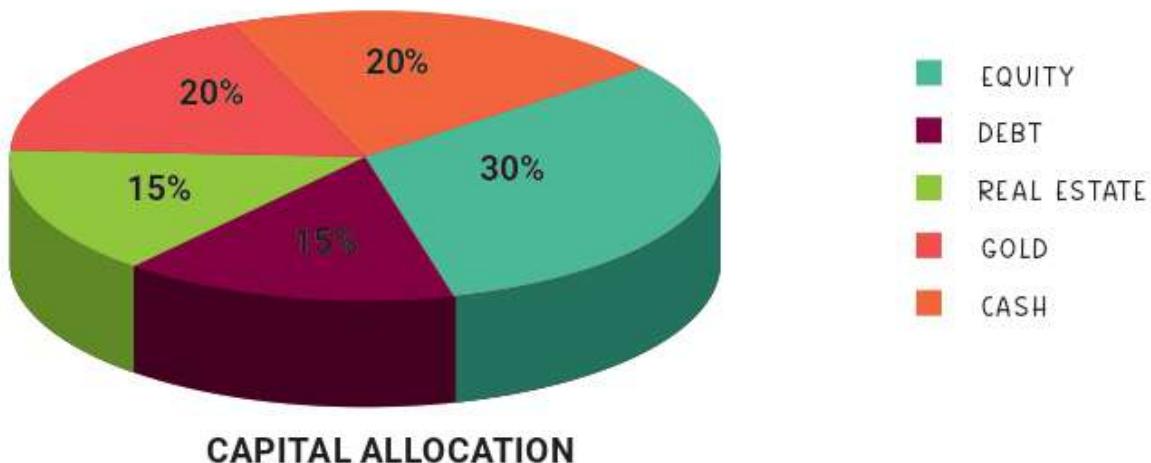
The securities we use for risk management may be costly. At times, it may also challenge the viability of any given strategy. But it is still important to have risk management to ensure survival. It is like Profitability v/s Survival. A balance between the two is what we must attain while we build or follow any strategy.

## 12.2 RISK MANAGEMENT TECHNIQUES

To have an effective risk management system is an integral part of trading futures and options market. There is no right way to manage risks. It can be done in extremely creative ways. Some of the common ones are :



## THE 1% RULE



The 1% rule basically talks about appropriate capital allocation. It answers the question of how much to invest in a trade? 1% rule says that you should never be in a position where you lose more than 1% of the portfolio on a single trade. This is something that will reduce the size of winners too but ensure survival in the market.

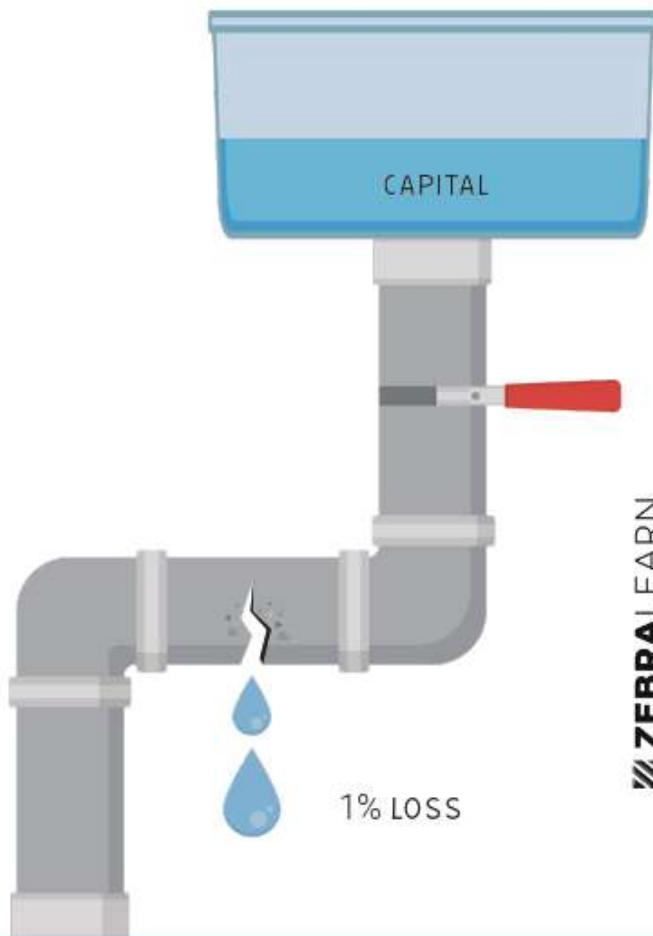
**For instance,**

if you have a capital of ₹10,000, you must not lose more than ₹100 in a single trade. This is a strategy to ensure survival by trading in limited quantities.

With this rule in place, we will have to consistently lose on a large number of trades to for our portfolio to be wiped out. This ensures survival in the market.

**For example,** lets say our portfolio is ₹10,000. We buy a call option. We will never spend more than ₹100 for the entire lot of the option if we plan to hold it till maturity.

Similarly, when we short a futures contract, we may want to buy a call option in such a way that maximum losses are limited to ₹100. At times, this 1% bar can be raised to 2% per trade by a trader. The bottom line is that we don't risk survival under any circumstances.



The only drawback here however is that this rule is difficult to follow with small portfolios and leverage makes it difficult too. So, for instance, you are a future on a share of ₹100 for a margin of ₹15. This means that 1% change in price will be roughly 6.67% change in our portfolio. As per the 1% rule, you should manage risks in such a way that risks are limited to 0.16% of the portfolio so that after leverage, we do not lose more than 1%. Thus, we have to extremely careful when working with leverage.

Also, with small portfolios, 1 lot may be more than their portfolio. So following the 1% rule becomes impossible there.



Not Losing more than 1% of the trading capital in a single trade is an excellent method to ensure long term survival.

₹1,00,000  
Trading capital → 100 Consecutive  
loss making trades → Get wiped out  
of the market

## STOP LOSS

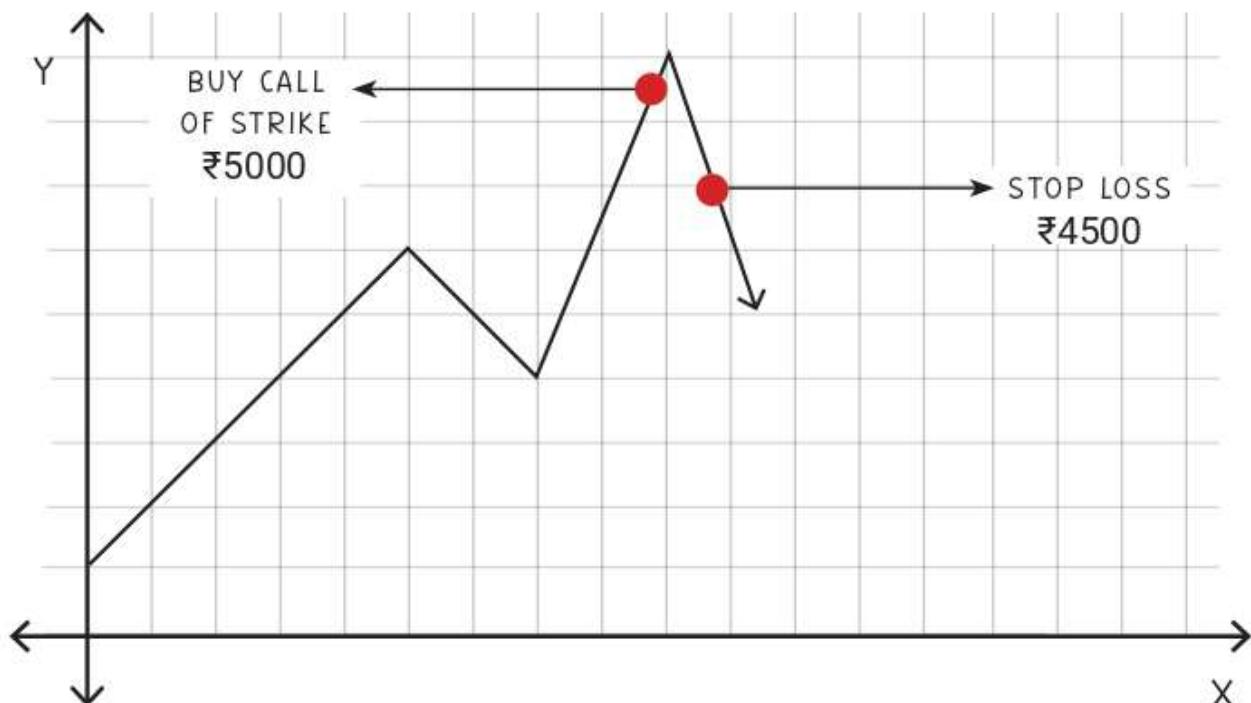
Before entering a trade, the maximum loss that you are willing to take is where you have your stop loss. Stop loss is a risk management tool that helps you exit a trade. As it hits the maximum loss mark where we set the stop loss, it exits the trade and stops our losses there.

**For instance**, we buy



ONE WAY TO SET A STOP LOSS IS BASED ON THE UNDERLYING ASSET PRICE. FOR INSTANCE, A STOP LOSS WHEN UNDERLYING ASSET PRICE FALLS BELOW ₹4500.

ALERTIVELY, YOU CAN HAVE MORE DIRECT STOP LOSS ON THE CALL OPTION PREMIUM AMOUNT. IF THE PRICE FALLS BELOW ₹15 FOR EXAMPLE.



The stop loss then will exit the position as price hit the stop loss. Advance orders are often placed with the broker that will sell the position as soon as the stop loss is hit. Stop losses help us limit the maximum losses that we can have in a position.

We may set it based on our percentage of loss also. For example, if we are investing ₹100 and we don't want to have a loss of more than 5%, so our stop loss will be at ₹95. This stop loss needs to be defined before entering the trade.

There are two major drawbacks with Stop losses:



THERE ARE TEMPORARY FALSE MOVEMENTS IN THE MARKET WHERE WE MAY LOSE MONEY DESPITE BEING RIGHT.

For instance, the price may be fluctuating from ₹100 to ₹98, ₹97, and for a few seconds come to ₹95 but then get back to ₹100.



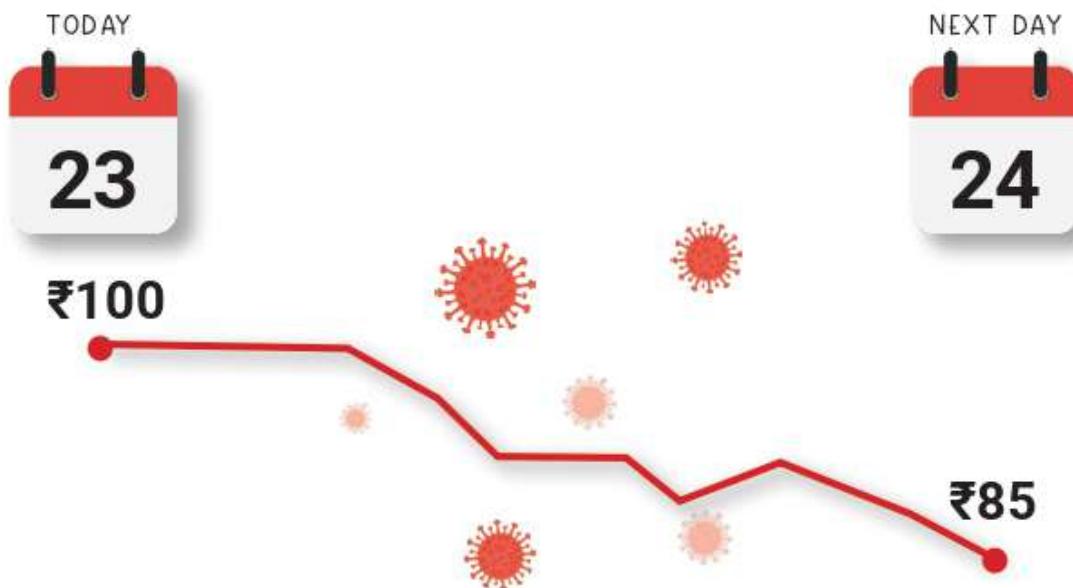
SO, THESE ARE FALSE MOVES OF THE MARKET THAT MAY TRIGGER OUR STOP LOSS AND MAKE US EXIT THE TRADE.

In such a scenario, the broker as directed will exit the trade as it touches ₹95 mark and we will have losses. We incurred a loss despite being right due to false movements in the market.



ANOTHER DRAWBACK OF STOP LOSS IS THAT IT DOES NOT WORK WITH OVERNIGHT RISK.

So, let's say the market closed at ₹100 today. Overnight there was some news that negatively affected the share. In this case, the markets would open the next day at a lowered price, say ₹85.



Our stop loss in such scenario would not work. It will not work while the markets are close. Such gaps are then borne by us as losses above our maximum loss bar. The above are the two major limitations with stop losses. Other than this, it is a very widely used and popular risk management method.

## HEDGING OF POSITIONS

To solve the issues faced with stop loss, hedging can be seen as an effective choice. Hedging refers to entering an opposite trade to our current trade to minimize our risk and losses.

Meaning, if we buy a share then to protect ourselves from losses, we may even take a short position on the same using derivatives. This may add to our cost of a trade and therefore affect profitability but we do it for survival.



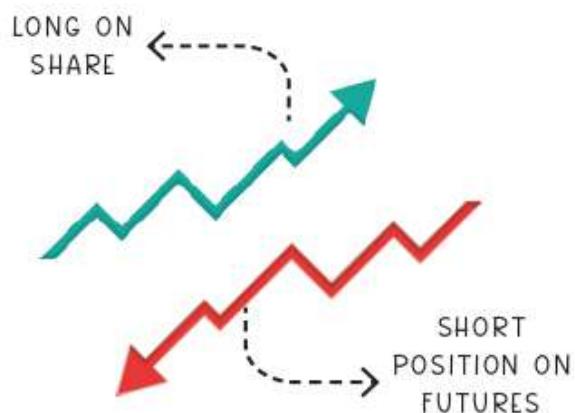
**For instance,** we buy a share at ₹1000 (original trade). To hedge ourselves, we may also buy a put option at a strike price of say ₹950 at a premium of ₹10 (opposite trade).



This opposite trade or position on the underlying asset will protect us against losses. Now, even if there is an overnight change, our position is hedged.

Our **maximum loss** will remain fixed. This is protective put strategy that we discussed in option strategies chapter.

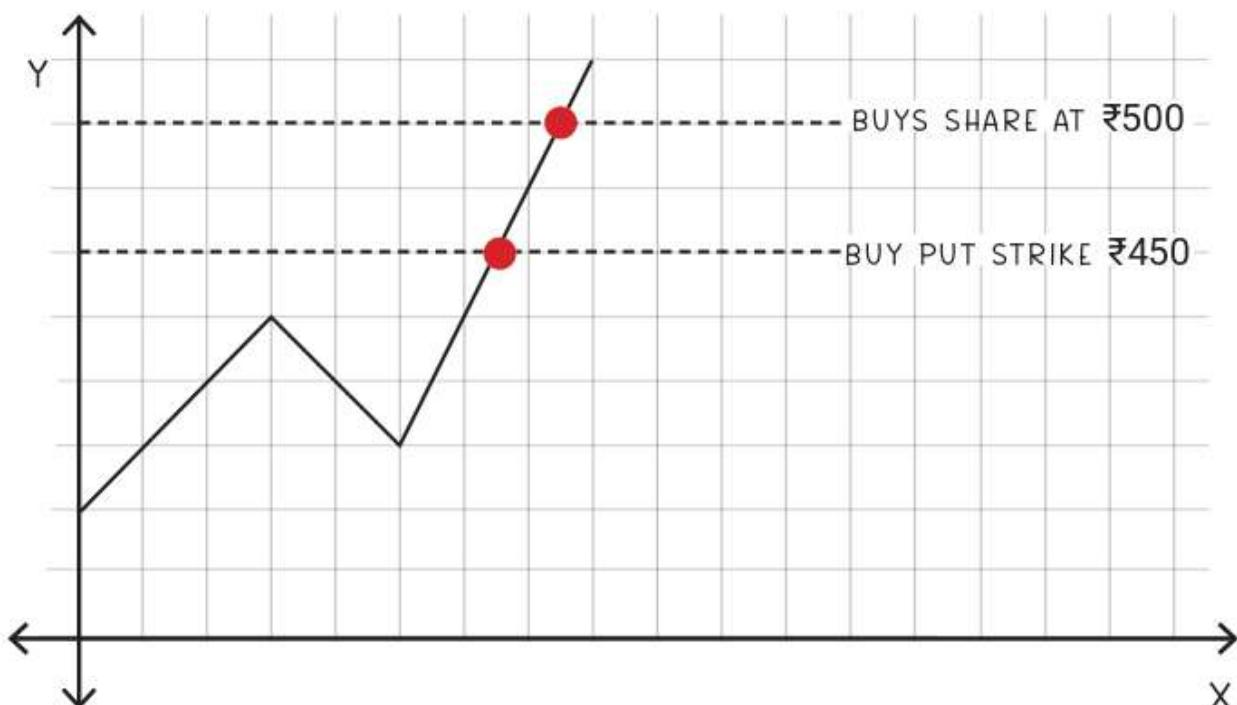
Ultimately, with hedging we protected against the downsides. We may even be long on a share and hedge ourselves by taking a short position with the futures. So, till the time to expiry of the futures, we will stay protected.



FOR THAT MATTER, EVEN THE FALSE MOVES RISK IS ADDRESSED WITH THIS RISK MANAGEMENT TOOL. WITH HEDGING YOU ALSO KNOW EXACTLY HOW MUCH YOUR MAXIMUM LOSS CAN BE. WE HAVE DEFINED MAXIMUM LOSS POTENTIAL WHEN IT COMES TO USING DERIVATIVE CONTRACTS.

We may buy a put option. Our maximum loss here will be the premium, while we still enjoy the upside of the share that we own.

**For example**, a man buys a share with current market price of ₹500 and at the same time buys a put option at strike ₹450.



IF PRICE  SHARES WILL BE PROFITABLE

IF PRICE  PUT OPTION WILL BE EXERCISED



The challenge with hedging is that it is too **EXPENSIVE**. The cost of an hedge is too high for us to keep our portfolio too hedged. We can only have hedges during uncertain times which are hard to predict. However, if done well, hedging is one of the most important methods of risk management.

## POSITION SIZING

Position sizing basically tells us about how much to trade or invest. We should not over trade, we should not under trade. We should not over invest or under invest.

POSITION SIZING BASICALLY MEANS QUANTITY, THE SIZE OF A PARTICULAR POSITION IN A PORTFOLIO.



For instance, if the portfolio is of ₹1 crore, then how much should be the value in each trade - ₹5lacs, ₹10 lakhs or ₹20 lacs. This is where position sizing comes into the picture.

We should ideally not be using the entire capital that we have for trading purposes. We should be using a part of the entire portfolio for trading even if we are a full time trader and use the rest as back up capital in case we face losses. We do not want to be in a position where we may face survival risks in the market and properly sizing positions and trade size ensures that we survive in the market. We need to ascertain, what should be our trade size with respect to the loss that we are willing to take.



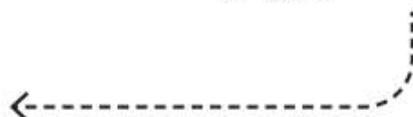
*For instance,*



We might have a capital of ₹10 lakhs.



And for a particular trade we may be expecting that if we put our ₹2 lakhs, it may go up to ₹3 lakhs or come down to ₹1 lakh.



While the risk that we are willing to take on portfolio is 5% (say). In this case, we would invest only 1 lakh from our capital.



This is because, even if the ₹1 lakh goes down 50% to ₹50,000, our overall loss will not be more than 5%. This is how we know how much to trade or invest with.

Had we traded with ₹5,00,000, our return could have gone up or down by ₹2.5 lakhs. In such a scenario, our portfolio could potentially go down by 25%. Having 2-3 trades like this will make us sit with an exceptionally low capital in a brief period. This will take our trading journey back by many years.

Similarly, if we trade with a very low amount, say ₹1000. Even if this ₹1000 becomes ₹2000, it will not have any significant impact on our overall portfolio return. Therefore, sizing the trade correctly is very important.



However, such calculations may be relatively easy to do with hypothetical examples but in real scenarios it is difficult. We must work with approximations and rough numbers therefore. We are aiming to have a systematic approach to risk taking while we trade using this risk management tool.

OVER TRADING OR UNDER TRADING, ARE BOTH BAD FOR US. WE WANT TO ENSURE THAT OVERALL, THE PORTFOLIO GROWS AND LOSSES STAY MINIMAL.

## RISK TO REWARD RATIO

RISK TO REWARD RATIO IS A MEASURE OF RISK UNDERTAKEN FOR A SPECIFIC REWARD TARGET IN A SPECIFIC PERIOD OF TIME.

$$\text{RISK REWARD RATIO} = \frac{\text{POTENTIAL RISK OF LOSS IN A TRADE}}{\text{EXPECTED RETURN}}$$

**Let's say,** we have a trade in which the potential loss (downside) is of ₹150 and expected upside is of ₹50. The risk to reward ratio here will be of 3:1. Similarly, if the potential loss is of ₹50 and expected profits are of ₹150, the ratio will be 1 : 3.

 ₹150 ₹50

Risk Reward Ratio = 3 : 1

 ₹50 ₹150

Risk Reward Ratio = 1 : 3

In markets, we don't get the potential loss or expected return like this. We assume them based on our experience and understanding of the markets. Traders also do backtesting for this.

**For instance**, let's say today is 1st January 2011. To back test, we go to 1st January 2012 and start applying the strategy that we are using currently. Then write down the trades and calculate, average profit : average loss. Secondly, calculate how many of the trades were profitable or how many times we made profits : how many times we made losses. Say we have average losses ₹300 and average profits ₹500. This means historically we had a 3 : 5 ratio.

Similarly, if while investing we expect that our ₹100 might come down by ₹20 and expected profit is also of ₹20, the ratio will be 1 : 1.

25% LOSS RATE

75% PROFIT RATE

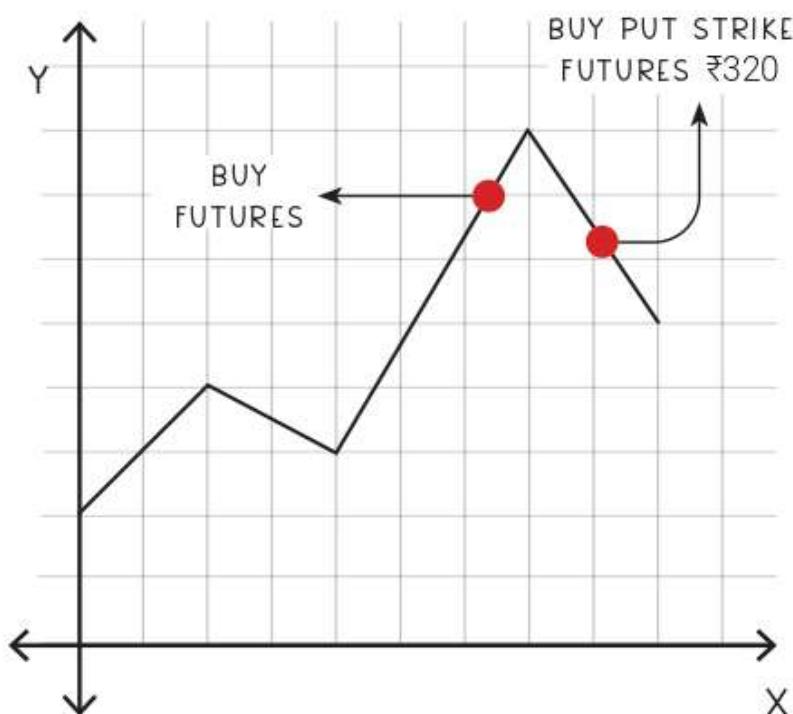
An ideal risk to reward ratio should be 1 : 3. But even with a 1 : 1 ratio if the winning rate is 75%, the overall profitability with the trade is good to have. Risk to reward ratio helps us analyse that we are not taking out sized risks to generate average returns in the market. It forces us to think in terms of risks and how much risk are we taking in each trade. It forces discipline in a trader.

## POSITION OF UNLIMITED LOSS

Position of Unlimited losses is whenever in derivatives we have a position where there is no limit to how much loss we might have to pay. For example, when we short a Futures contract, or when sell options, there is no limit how much we may incur as loss. These are called Positions of unlimited losses. As a risk management practice, these are to be strictly avoided. Whenever, you are selling options that must be accompanied by buying another option at different strike price to limit losses.

If we sell a put option, it must be accompanied by buying a put option at a lower strike price so that the position of unlimited losses no longer exists. When we are selling call options, we must buy another call option that has a higher strike price. When we are selling a futures contract short, we must buy a high call option.

All these are risk management trades that we take, which reduces our profitability, but ensures that we survive in the market. One news does make us bankrupt. There are countless stories in the market where a trader did really well for 4-5 years taking such high risk positions but with one news the entire portfolio got wiped out. Unimaginable things keep on happening in the market and you do not want to lose your portfolio to that.



#### **For example:**

Suppose we have sold a futures contract at ₹350. The contract is leveraged 6 times. To protect ourselves from unlimited losses, we may take an opposite position here. Say we buy a call option at strike price of ₹380. So any price increase beyond ₹380 will be compensated by the call option. This way we have converted our unlimited loss position to limited loss position as the losses from short selling would be compensated by profits from the call option.

## **12.3 CONCLUSION**

As we form our own strategies and practice trading, we will understand them more deeply. One thing to be mindful of is to apply risk management tools effectively. Risk management tools and rules must be taken very seriously. They should be part of our trading discipline to ensure the survival of our portfolio for a longer period in our journey of trading.

With these things that we have learned so far, we are ready to apply this in our trading journey. However, with all this knowledge about derivatives, F&O market, option strategies, spreads we must also understand technical analysis. When used with proper analysis and risk management in place, these have the potential to be extremely rewarding. At the same time, if used carelessly, they can be loss making instruments for you. Options and Futures is best combined with technical analysis to execute different instruments in the markets.

F&O markets are very competitive and the derivatives used in this market are weapons of destruction if not used wisely. These financial instruments use leverage with them and therefore can have unlimited loss positions. All the measures of proper risk management are therefore vital for survival in trading journey. The discipline of risk management must be applied accurately. Only calculated exposures are recommended.



We cannot emphasize how important is risk management. With risk management in center, if we spend a lot of time with charts and options chains, the chances of a good outcome increase. However, be extremely careful of the risks. Two things to be kept in mind :

- 1** PRACTICE AND EXPERIMENTATION ARE THE ONLY CHOICES WHEN ENTERING THIS FIELD.
- 2** RISK MANAGEMENT AND SURVIVAL SHOULD BE ABOVE EVERYTHING ELSE.

With this, we wish you luck and extremely disciplined trading experience.



# Notes

# Notes

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