

BASEMETALS OPTIONS

A Primer



MCX
METAL & ENERGY
Trade with Trust

Some interesting facts about base metals...

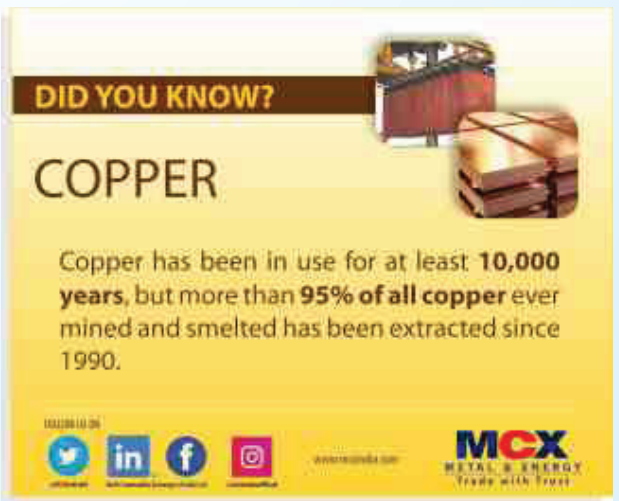












UNDERSTANDING OPTIONS

What are Options contracts?

Options are derivatives instruments which gives the buyer the right, but not the obligation, to buy or sell an underlying asset/ instrument at a specific price on or before a certain date.

What can be underlying for Options?

The underlying to an option contract can be equity, commodity, foreign exchange, futures contracts, interest rates, real estate or any other asset/ instrument. For example, Copper futures contract can be an underlying for a Copper option contract.

What are the special features of Options?

- Options give right to buyer, but no obligation, to buy or sell the underlying.
- They allow one to 'lock in' a future buy or sell price for an underlying.
- Options can be exchange-traded or Over-the-Counter (OTC)



Assume Matthew wishes to buy a commodity from Abdul after a month, but wants to lock in the price today. After negotiation, Matthew enters into an 'option' agreement with Abdul that gives him a right to buy the commodity for ₹10 lakh after end of one month. To execute this option, Matthew pays Abdul a nominal amount say, ₹10,000. After a month, either of the two situations may arise:

1. The price of the commodity goes up

As ruling prices are higher, Matthew prefers to exercise his 'option' of buying the commodity at the agreed price of ₹10 lakh with Abdul.

2. The price of the commodity goes down

It is advantageous for Matthew to buy the commodity outside the agreement since prices have fallen and thus, he would let the 'option' agreement go unexercised and buy the commodity from outside. In this scenario, the maximum loss to Matthew would be ₹10,000, which he had paid to Abdul for entering into the 'option' agreement.

Note: Matthew has the right but not the obligation to buy from Abdul. Abdul, on the other hand, is obligated to sell to Matthew, if he exercises his option.

Do you know?

Options...

- are akin to a form of price insurance and, therefore, are best suited for hedgers
- can be bought by paying only a one-time fee/ premium
- buyers don't have any daily margin calls
- buyer's maximum risk is limited to premium paid
- buyers can take advantage of any favourable price movement in underlying

UNDERSTANDING OPTIONS



CONTRACT TERMS

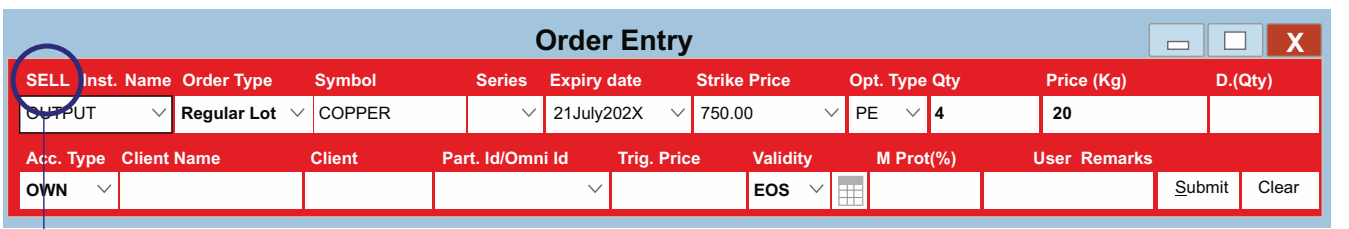


Buy/long is the buying of a commodity options contract. One who buys an option is Option buyer/ holder.

The last day till which the option contract is valid.

Strike price is the price at which the underlying (commodity futures contract) can be bought or sold.

Premium is the price, the option buyer pays to the option seller for purchase of an option contract.



Sell/short is the selling of a commodity options contract. One who sells an option is called Option writer/seller.

Open Interest: *The total number of open or outstanding (not closed or delivered) options contract that exists at any given point of time.*

Exercise: *The option buyer's decision to deliver/ take delivery of the underlying. Only the buyer has the right to exercise the option.*

Assignment*: When an option holder exercises the option, a seller is assigned, who is obligated to buy/sell the underlying at the strike price.*

CLASSIFYING OPTIONS

A. BASED ON RIGHT OF HOLDER

CALL OPTION

A call option, gives the buyer (holder) of the option the right to buy the underlying (for example a commodity futures contract), at a pre-determined price on or before the expiration date.

Example: **Buying call option – hedge against risk of rising prices**

- On August 30, a company buys an MCX Zinc call 'option on futures'
- Underlying: MCX Zinc September futures contract
- Option Expiration Date: 22nd September
- Strike Price: ₹200
- Option Contract: Right to buy underlying MCX Zinc futures at a price of ₹200 per Kg at option expiry

When will this right become valuable to exercise?

- When underlying Zinc futures prices are above ₹200 per Kg at option expiry
- If the Zinc futures price moves below ₹200 per Kg at option expiry, the call option buyer may let his option expire worthless as he is not obligated to buy the underlying Zinc futures contract

PUT OPTION

A put option gives the buyer (holder) of the option the right to sell the underlying (for example a commodity futures contract), at a fixed price on or before the expiration date.

Example: **Buying put option – hedge against risk of falling prices**

- On June 26, a Copper miner buys an MCX Copper put 'option on futures'
- Underlying: MCX Copper July futures contract
- Option Expiry Date: 21st July
- Strike Price: ₹760
- Option Contract: Right to sell underlying Copper futures at a price of ₹760 per Kg on expiration of the option contract

When will this right become valuable to exercise?

- Only if underlying Copper futures price goes below ₹760 per Kg.
- If the Copper futures prices rise above ₹760 per Kg, the put option buyer is not obligated to sell the underlying and may let his option expire worthless.

B. BASED ON EXERCISE

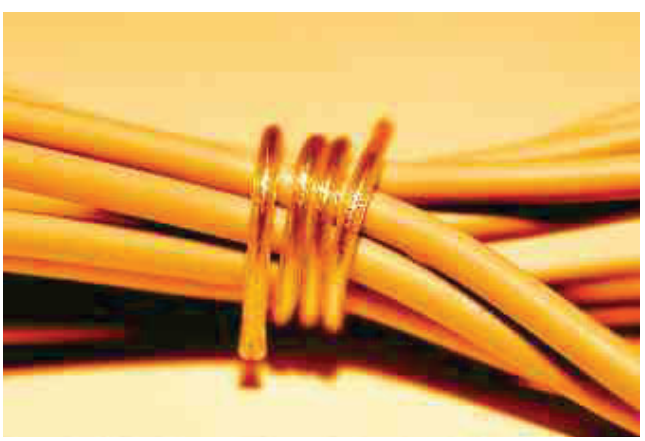
- **American:** In an American Style option contract, the buyer of the option can choose to exercise his option at any time between the purchase date and the expiry date of the option contract.

  As it provides a greater degree of flexibility to the investor, the premium can sometimes be higher than the European Style option.

- **European:** In a European Style option contract, the buyer of the option can choose to exercise his option only on the date of expiration of the contract.

  It does not provide the same degree of flexibility to the investor as an American Style option.

As per SEBI circular on **Options on Commodity Futures - Product Design and Risk Management Framework**, dated June 13, 2017, commodity options would be European Style to begin with.



PARTICIPANTS AND THEIR PAY-OFFS IN OPTIONS MARKET

PARTICIPANT	PROFIT *(UPSIDE POTENTIAL)*	LOSS *(DOWNSIDE POTENTIAL)*
Call holder/ buyer	Unlimited *(to the extent of increase in price above strike price)*	Limited *(to the extent of premium paid)*
Put holder/ buyer	Practically unlimited *(to the extent of price of underlying becoming zero)*	Limited *(to the extent of premium paid)*
Call writer/ seller	Limited *(to the extent of premium received)*	Unlimited *(to the extent of increase in price above strike price)*
Put writer/ seller	Limited *(to the extent of premium received)*	Practically unlimited *(to the extent of price of underlying becoming zero)*

Unlike an **option holder** who has a limited risk *(the loss of the option premium)* but practically unlimited potential for gains; an **option writer** is exposed to practically unlimited risk with limited gains *(to the extent of option premium).*

WHY USE OPTIONS?

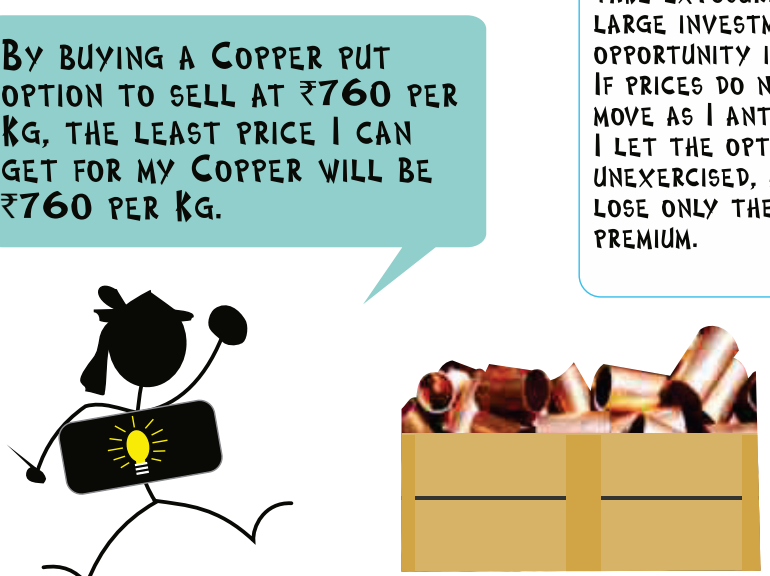
Hedging: An option allows its holder to 'lock-in' a price of the underlying with no obligations and thus avoid the risk arising from unfavourable prices.

It functions just as an insurance policy and can be used to insure against adverse price movement by paying a premium.

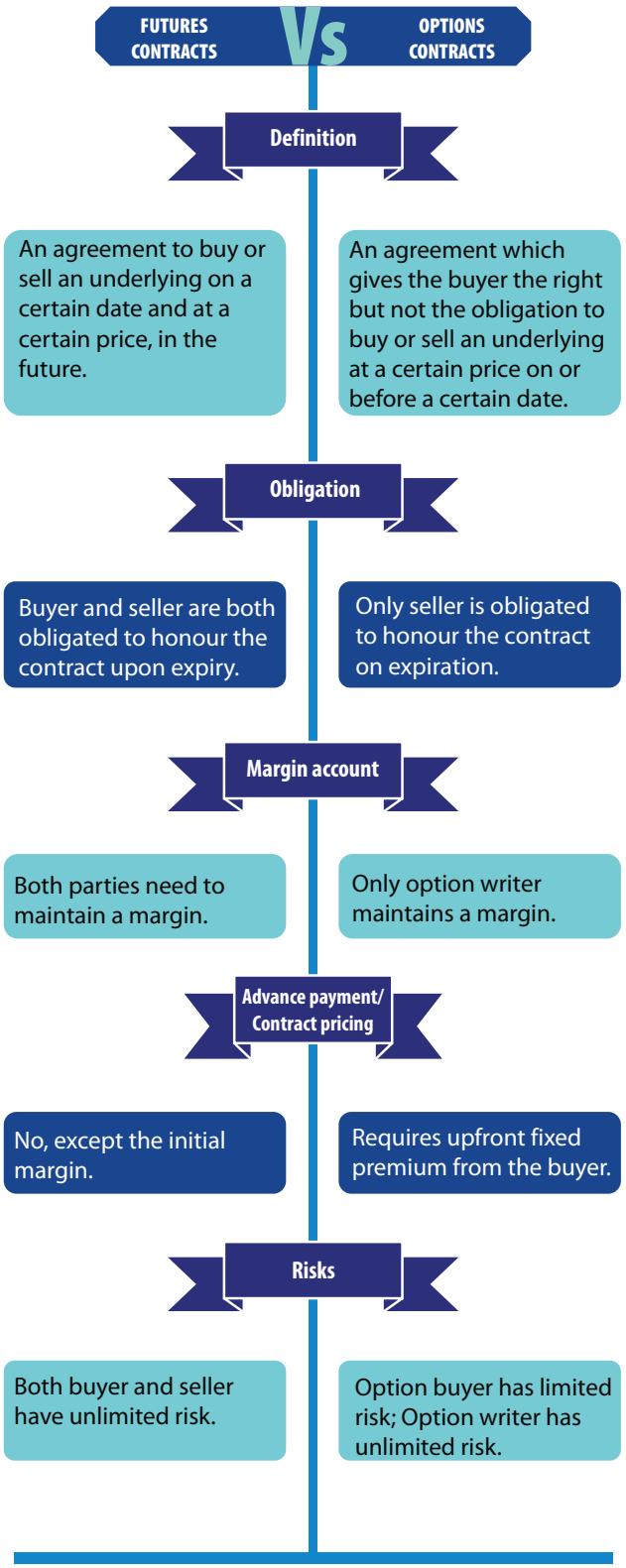
A Copper miner can safeguard against possible fall in price by buying an option, i.e. a 'Put Option' contract. This will give him the right to sell his output at a certain pre-decided price. It is his right to sell at that price, not his obligation.

Investment: Investors enter into an option trade by anticipating the movement in prices of the underlying. Options provide a source of leverage as they are cheaper to purchase in comparison to the actual underlying.

The one-time upfront price paid to buy an option helps the buyer measure their potential downside in advance.



HOW ARE OPTIONS DIFFERENT FROM FUTURES?



WHAT IS 'MONEY-NESS' IN OPTIONS TRADING?

Moneyness tells option buyers whether exercising will lead to a profit.

IN-THE-MONEY (ITM): *(Profit)*
Call option - underlying price is higher than the strike price.
Put option - underlying price is lower than the strike price.

OUT OF THE MONEY (OTM): *(Loss)*
Call option - underlying price is lower than the strike price.
Put option - underlying price is higher than the strike price.

AT THE MONEY (ATM): *(No profit - no loss)*
The underlying price is equivalent to strike price. As per SEBI guidelines, Commodity Option series having strike price closest to the Daily Settlement Price (DSP) of underlying Commodity Futures are ATM option series.

CLOSE TO THE MONEY (CTM)
The ATM option series along with 2 option series with strike prices immediately above and below ATM are 'Close to the money' (CTM) option series, as per SEBI guidelines.

If DSP is midway between 2 strike prices, immediate 2 option series having strike prices just above DSP and immediate 2 option series having strike prices just below DSP are CTM series.

Alchemists burned Zinc in air to form what they called "Philosopher's Wool"

HOW ARE OPTIONS PRICED?

How are Options on futures priced?

Options are priced using several models. The most popular model to price a commodity option on futures is the Black-76 model.

The Black 76 model states:

$$Call = e^{-rt}\,[F*N(d1) - K*N(d2)]$$
$$Put = e^{-rt}\,[K*N(-d2) - F*N(-d1)]$$
$$d1 = \frac{\ln\left(\frac{F}{K}\right) + \left(\frac{\sigma^2}{2}\right)t}{\sigma\sqrt{t}} \qquad d2 = d1 - \sigma\sqrt{t}$$

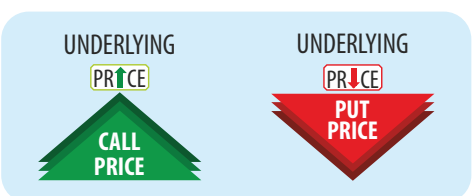
Where,
F = Current underlying futures price
K = Strike price of the option
t = Time in years until the expiration of the option
r = risk free interest rate
σ = volatility of the underlying futures contract
N(.)=Standard normal cumulative distribution function

Options prices have two components:

Intrinsic Value:
It is the In-the money portion of the option premium. For a Call Option it is excess of underlying futures prices over the strike price and for Put Option it is excess of strike price over underlying futures prices.

Time Value:
It is the difference between the Option premium and the intrinsic value of the option.

FACTORS	INCREASE		DECREASE	
	CALL PRICES WILL	PUT PRICES WILL	CALL PRICES WILL	PUT PRICES WILL
Underlying Price	↑	↓	↓	↑
Time until Expiration	↑	↑	↓	↓
Volatility	↑	↑	↓	↓
Interest Rates	↓	↓	↑	↑
Strike Price	↓	↑	↑	↓



FACTORS INFLUENCING OPTIONS PRICES (Black -76 model)

Factors influencing underlying commodity futures prices

Prices of the underlying, that is, commodity futures, are influenced by several factors. Some of such factors include:

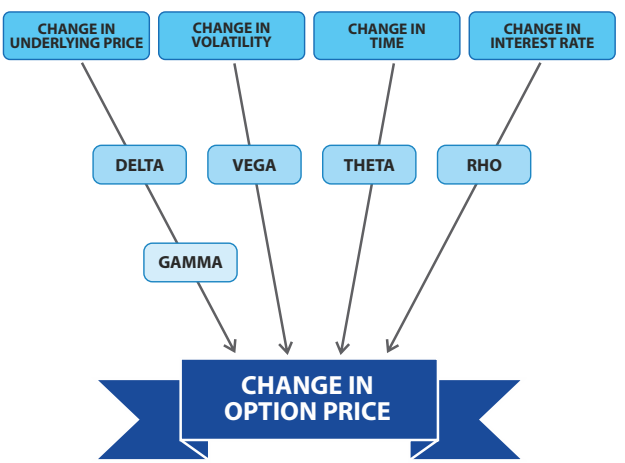
- supply demand balances
- global factors
- policy interventions
- industrial growth
- global data releases, viz.
  - rate changes by U.S. Federal Reserve
  - U.S. jobs reports
  - China's growth numbers

WHAT ARE GREEKS?

Greeks
The Greeks primarily measure the sensitivity of option prices in relation to four factors:

1) Change in the prices of the Underlying (Futures Contract), also commonly referred to as **Delta (δ)**
2) Change in the Time period also commonly referred to as **Theta (θ)**
3) Change in the Volatility also commonly referred to as **Vega (ν)**
4) Change in the interest rates also commonly referred to as **Rho (ρ)**

Delta's sensitivity to changes in the price of the underlying asset is referred to as **Gamma (γ).**



COMMODITY OPTION PAY-OFF

Call Options

Anshika is expecting an upward movement in copper prices within the next two months.

To hedge against the risk of possible price rise, she buys a 3 months expiry copper call option on futures at a strike price of Rs. 750 per Kg for a premium of Rs. 25 per Kg from Tulika.

Two scenarios are possible:

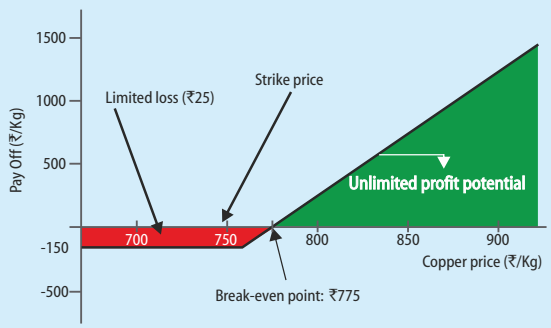
1) **Copper price falls below ₹750:**
   Anshika will not exercise her option and hence only suffer a loss to the extent of premium paid of Rs. 25 (red part of the graph). This will be Tulika's gain.

2) **Copper price moves above ₹750:**
   Anshika will be In-the-money when prices move upward of Rs. 750 and will be in net profit above Rs. 775 (strike price + premium).

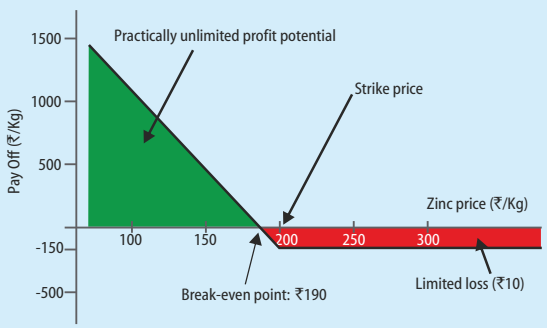
   As Option buyer, her profit potential is unlimited (green part of the graph).

On the other hand, Tulika starts incurring losses; higher the price above Rs. 750, higher is her loss.

CALL OPTION BUYER'S - PAY OFF



PUT OPTION BUYER'S - PAY OFF



Put Options

Tanmay holds stock of zinc and fears a price fall within the next two months. To manage this risk, he buys from Suresh a zinc put option on future at a strike price of Rs.200 per Kg for a premium of Rs. 10 per Kg.

Two scenarios are possible:

1) **Zinc price falls below ₹200.**
   Tanmay will enjoy a rise in payoffs for the put option till zinc price becomes zero (green part of the graph).

Thus the maximum profit that he can have is Rs. 190 per Kg (Strike price, less option premium). Suresh's losses, on the other hand, keep rising till zinc price becomes zero.

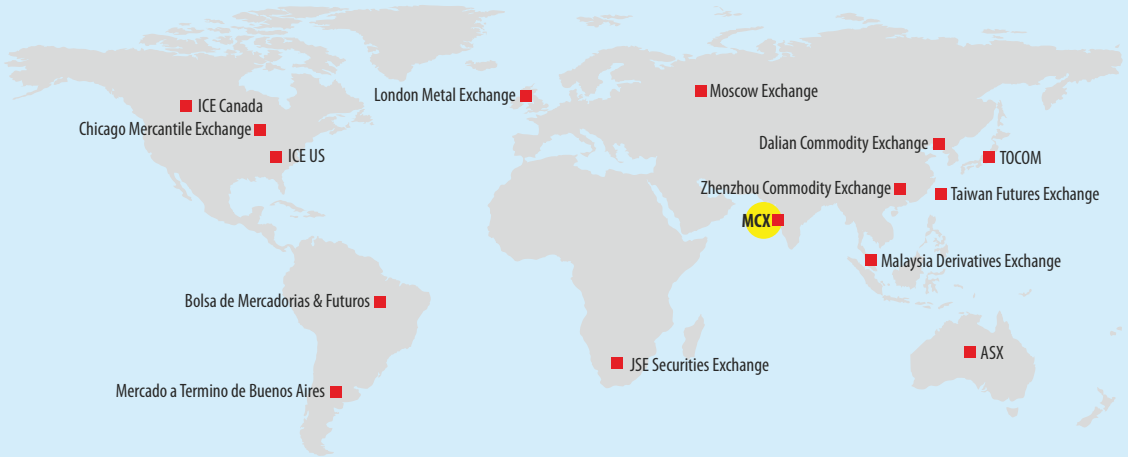
2) **Zinc price moves above ₹200.**
   Tanmay will not exercise the option and his maximum loss is the premium paid, i.e. Rs. 10 (red part of the graph). This will be Suresh's gain.

Thus, from both these examples, it is clear that the option buyer has a potentially large upside, but limited downside. The option seller, however, encounters the opposite: they have limited upside but potentially a large downside from price movements of the underlying.

(Trading costs related to brokerage, taxes etc are ignored in the examples cited above.)

Copper has been in use at least 10,000 years, but more than 95% of all copper ever mined and smelted has been extracted since 1900.

A FEW PROMINENT GLOBAL EXCHANGES WITH COMMODITY OPTIONS TRADING



A FEW POPULAR OPTIONS TRADING STRATEGIES

STRADDLE:

- Simultaneously buying of a put and a call of the same underlying, strike price and expiration date.
- Used when anticipating a price swing but direction of swing not known.

BULL CALL SPREAD:

- Buying a call option at a particular strike price and simultaneously selling a call option at higher strike price of the same underlying and expiration month.
- Used when one is moderately bullish.

STRANGLE:

- Simultaneous buying of out-of-the-money put and out-of-the-money call of the same underlying and expiration date.
- Works best when underlying price moves sharply in either direction.

BEAR PUT SPREAD:

- Buying a put option at a particular strike price and simultaneously selling a put option at lower strike price of the same underlying and expiration month.
- Used when one is moderately bearish.

Some interesting facts about base metals...













FLEXIBILITY JUST ENTERED THE MARKET



OPTIONS ARE HERE

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