

# *Bij Investment* *Consultants*

*Options Terminology*

# Options Contract

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- An Option is a contract that **Gives The Right, but not an obligation, to buy or sell the underlying asset** on or before a stated date/day, at a stated price, for a price.
- Taking a **Long Position** i.e. Buying the Option is called **Buyer/ Holder of the Option**.
- Taking a **Short Position** i.e. Selling the Option is called the **Seller/ Writer of the Option**.

# Options Contract

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- **The Option Buyer has The Right** but no obligation with regards to Buying or Selling the underlying asset.
- **The Option Writer has the Obligation** in the contract.
- **Option Buyer/ Holder will exercise his option only** when the situation is **Favourable to him**, but, when he decides to exercise, option writer would be legally bound to honour the contract.

# Options Contract

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## Types of Options:

● **Call Options:** which gives Buyer a **Right to Buy** the underlying asset, is called **Call option**.

● **Put Options:** which gives Buyer a **Right to Sell** the underlying asset, is called **Put option**.

# Options Terminology

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- **Index Option:** These options have index as the underlying asset. For example options on Nifty, Sensex, etc.
- **Stock Option:** These options have individual stocks as the underlying asset. For example, option on ONGC, NTPC etc.

# Options Terminology

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- **Buyer of an Option:** The buyer of an option is one who has a right but not the obligation in the contract. For owning this right, he pays a price to the seller of this right called '**Option Premium**' to the option seller.
- **Writer of an Option:** The writer of an option is one who receives the option premium and is thereby obliged to sell/buy the asset if the buyer of option exercises his right.

# Options Terminology

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- **Spot price (S):** It is the price at which the underlying asset trades in the spot market.
- **Strike price or Exercise price (X):** Strike price is the price per share for which the underlying security may be purchased or sold by the option holder.
- **Option price/Premium:** It is the price which the option buyer pays to the option seller.

# Options Terminology

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- **Lot size:** Lot size is the number of units of underlying asset in a contract.
- **Expiration Day:** The day on which a derivative contract ceases to exist. It is the last trading date/day of the contract.
- **Open Interest:** As discussed in futures section, open interest is the total number of option contracts outstanding for an underlying asset.

# Options Terminology

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- **Exercise of Options:** Options are exercised with respect to the settlement value/ closing price of the stock on the day of exercise of option.
- **Assignment of Options:** Assignment of options means the allocation of exercised options to one or more option sellers.

# Options Terminology

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- **American option:** The owner of such option can exercise his right at **any time on or before the expiry** date/day of the contract.
- **European option:** The owner of such option can exercise his right **only on the expiry** date/day of the contract. In India, Index options are European.

# Options Terminology

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- **In the money (ITM) option:** This option would give holder a positive cash flow, if it were exercised immediately.
- A **Call Option** is said to be ITM, when Spot price is Higher than Strike Price.
- A **Put Option** is said to be ITM when Spot price is Lower than Strike Price.

# Options Terminology

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● **At the money (ATM) option:** At the money option would lead to zero cash flow if it were exercised immediately.

● A **Call Option** is said to be ATM, when Strike Price is Equal to Spot Price.

● A **Put Option** is said to be ATM when Strike Price is Equal to Spot Price.

# Options Terminology

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- **Out of the money (OTM) option:** OTM is one with Strike Price worse than the Spot Price for the holder of option. It gives the holder a negative cash flow if it were exercised immediately.
- A **Call Option** is said to be OTM, when Spot Price is Lower than Strike Price.
- A **Put Option** is said to be OTM, when Spot Price is Higher than Strike Price.

# Options Terminology

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- **Intrinsic value:** For an option, intrinsic value refers to the amount by which option is in the money i.e. the amount an option buyer will realize, before adjusting for premium paid, if he exercises the option instantly.
- Only ITM options have intrinsic value.
- ATM and OTM have zero intrinsic value.
- The intrinsic value of an option can never be negative.

# Options Terminology

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## Intrinsic value:

● **For Call Option** which is in-the-money, intrinsic value is the excess of spot price ( $S$ ) over the exercise price ( $X$ ), with minimum value possible as zero.

● **For Put Option** which is in-the-money, intrinsic value is the excess of exercise price ( $X$ ) over the spot price ( $S$ ), with minimum value possible as zero.

# Options Terminology

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- **Time value:** It is the difference between premium and intrinsic value.
- ATM and OTM options will have only time value because the intrinsic value of such options is zero.

# Application Of Options

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## Call Options

- Bullish View: Buy Call Option
- Bearish View : Short Call Option

## Put Options

- Bullish View: Short Put Option
- Bearish View : Buy Put Option

# Options Pricing

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Five fundamental parameters on which the option price depends:

- Spot price of the underlying asset
- Strike price of the option
- Volatility of the underlying asset's price
- Time to expiration
- Interest rates

# Options Pricing

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## Options Pricing Models

- The Binomial Pricing Model
- The Black & Scholes Model

# Options Pricing

## The Black & Scholes Model formula:

$$OP = SN(d_1) - Xe^{rt}N(d_2)$$

Where,

$$D1 = [\ln(s/n) + (r + (v^2/2)t)] / v\sqrt{t}$$

$$D2 = d1 - v\sqrt{t}$$

And the variables are

S = stock price

X = strike price

t = time remaining until expiration, expressed in years

r = current continuously compounded risk-free interest rate

v = annual volatility of stock price (the standard deviation of the short-term returns over one year)

ln = natural logarithm

N(x) = standard normal cumulative distribution function

e = the exponential function

# Option Greeks

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## Delta ( $\delta$ or $\Delta$ )

- **Delta** = Change in option premium/ Unit change in price of the underlying asset.
- The most important of the ‘Greeks’ is the option’s “Delta”.
- This measures the sensitivity of the option value to a given small change in the price of the underlying asset.

# Options Pricing

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## Delta ( $\delta$ or $\Delta$ )

- Delta for **Call Option Buyer** is positive. This means that the value of the contract increases as the share price rises.
- Delta for **Call Option Seller** will be same in magnitude but with the opposite sign (negative).

# Options Pricing

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## Delta ( $\delta$ or $\Delta$ )

- Delta for **Put Option Buyer** is negative. The value of the contract increases as the share price falls. This is similar to a short or 'bear' position in the underlying asset.
- Delta for **Put Option Seller** will be same in magnitude but with the opposite sign (positive).

# Options Pricing

## Gamma ( $\gamma$ )

- **Gamma** = Change in an option delta/ Unit change in price of underlying asset
- It measures change in delta with respect to change in price of the underlying asset.
- It is calculated as the ratio of change in delta for a unit change in market price of the underlying asset.

# Options Pricing

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## Gamma ( $\gamma$ )

- Gamma works as an acceleration of the delta, i.e. it signifies the speed with which an option will go either in-the-money or out-of-the-money due to a change in price of the underlying asset.

# Options Pricing

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## Theta ( $\theta$ )

- **Theta = Change in an option premium/ Change in time to expiry**
- It is a measure of an option's sensitivity to time decay.
- Theta is the change in option price given a one-day decrease in time to expiration.

# Options Pricing

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## Theta ( $\theta$ )

- Theta is generally used to gain an idea of how time decay is affecting your option positions.
- theta is negative for a long option, whether it is a call or a put. Other things being equal, options tend to lose time value each day throughout their life. This is due to the fact that the uncertainty element in the price decreases.

# Options Pricing

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## Vega (v)

- Vega = Change in an option premium / Change in volatility
- This is a measure of the sensitivity of an option price to changes in market volatility.
- It is the change of an option premium for a given change (typically 1%) in the underlying volatility.

# Options Pricing

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## Vega ( $v$ )

- Vega is Positive for a Long Call and a Long Put.
- Vega is Negative for a Short Call and a Long Put
- An increase in the assumed volatility of the underlying increases the expected payout from a buy option, whether it is a call or a put.

# Options Pricing

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## Rho ( $\rho$ )

- Rho = Change in an option premium / Change in cost of funding the underlying
- Rho is the change in option price given a one percentage point change in the risk-free interest rate.
- Rho measures the change in an option's price per unit increase in the cost of funding the underlying.

# Options Trading Strategies

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- Option spreads
- Straddle
- Strangle
- Covered call
- Protective Put
- Butterfly Spread

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**Thank You**