

Option Greeks

EXPLORE - UNDERSTAND - EXECUTE

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Market Experience : 26 Years

- Technical Market Strategist : Share khan
- Asia Pacific Equity Research : Citi Global Markets
- Technical Market Strategist : Centrum Broking
- Product Head : Ignite – Sharekhan Education
- Sr VP : Motilal Oswal : Head School Of Trading & Investing
- Head Education : Fin Learn Academy
- Media Appearance : CNBC & NDTV Profit

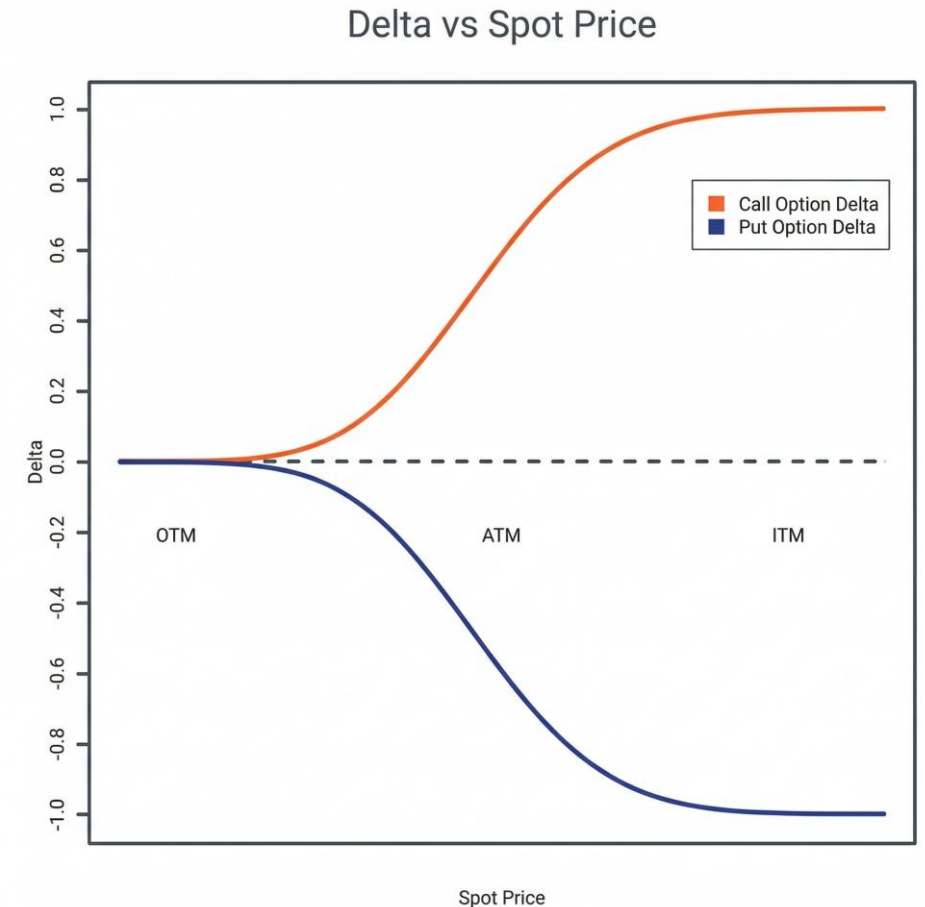
- "Greeks" is a term used in the options market to describe the various dimensions of risk involved in taking an options position.
- These variables are called Greeks because they are typically associated with Greek symbols.
- Options Greeks, and the natural demand supply situation of the markets influence each other.
- Though all these factors work independently, yet they are all intertwined with one another.

Option Greeks

Delta	Δ	<ul style="list-style-type: none">Delta : Measures the change of options premium based on the directional movement of the underlying
Gamma	γ	<ul style="list-style-type: none">Gamma : Rate of change of delta itself
Theta	θ	<ul style="list-style-type: none">Theta : Time value decay . Measures the impact on premium based on time left for expiry
Vega	v	<ul style="list-style-type: none">Vega : Rate of change of premium based on change in volatility
Rho	ρ	<ul style="list-style-type: none">Rho : Measures how much an option's price will change for a 1% move in interest rates

Delta

- Measures how much the **option price changes when the underlying asset moves by ₹1.**
- Call options have **positive Delta** (0 to +1)
- Put options have **negative Delta** (0 to -1)
- Higher Delta means the option moves **more closely with the stock**
- Used to estimate **probability of the option finishing in-the-money.**



Moneyness - Delta

Call Option

	OTM 4
	OTM 3
	OTM 2
	OTM 1
Above	_____
	CMP = ATM
Below	_____
	ITM 1
	ITM 2
	ITM 3
	ITM 4

Nifty Strike Interval = 50 points

		Delta
	OTM 4 24500	0.10
	OTM 3 24450	0.20
	OTM 2 24400	0.30
	OTM 1 24350	0.40

	Nifty CMP = 24292= ATM = 24300	0.50

	ITM 1 24250	0.60
	ITM 2 24200	0.70
	ITM 3 24150	0.80
	ITM 4 24100	0.90
	ITM 5 24050	1.00

Moneyness - Delta

Put Option

	ITM 1
	ITM 2
	ITM 3
	ITM 4
Above	_____
	CMP = ATM
Below	_____
	OTM 4
	OTM 3
	OTM 2
	OTM 1

Nifty Strike Interval = 50 points

			Delta
	ITM 4	24500	0,90
	ITM 3	24450	0.80
	ITM 2	24400	0.70
	ITM 1	24350	0.60
Nifty CMP = 24292= ATM = 24300			0,50
	OTM 1	24250	0,40
	OTM 2	24200	0.30
	OTM 3	24150	0.20
	OTM 4	24100	0.10

- Gamma measures the rate of change of Delta with respect to the price movement of the underlying asset
- It shows how fast Delta will move when the underlying price changes
- Higher Gamma = Delta changes quickly; Lower Gamma = Delta changes slowly
- At-the-money (ATM) options have the highest Gamma
- Deep in-the-money (ITM) and deep out-of-the-money (OTM) options have low Gamma
- Gamma is called the 2nd order derivative of the premium
- As an analogy to physics, the delta of an option is its "speed," while the gamma of an option is its "acceleration".
- **Gamma is highest when the option is close to expiry.**

Gamma : Example

SPOT = 24163

Strike 24150

Nifty : 24158

ATM 24150 CE : 56

Delta : 0.50

Gamma : 0.0029

Nifty -50

New Delta CE 24150 ?

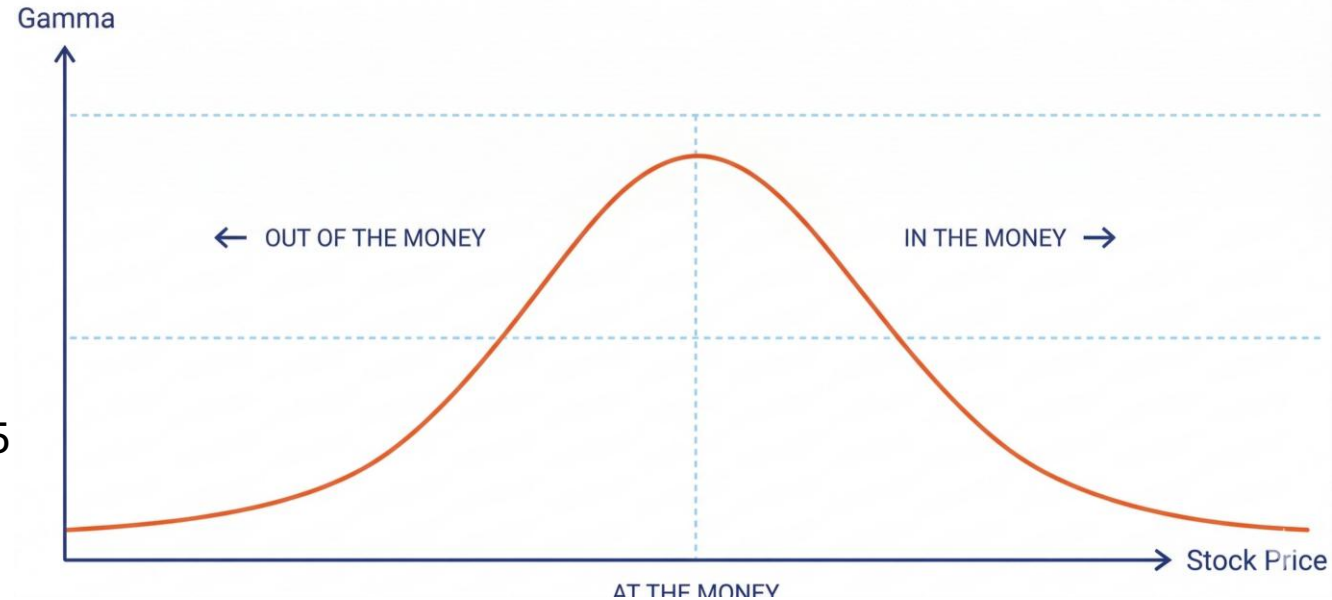
ATM CE : 0.50

Change in premium = $50 * 0.50 = 25$

New premium = $50 - 25 = 25$

New Gamma = $25 * 0.0029 = 0.0725$

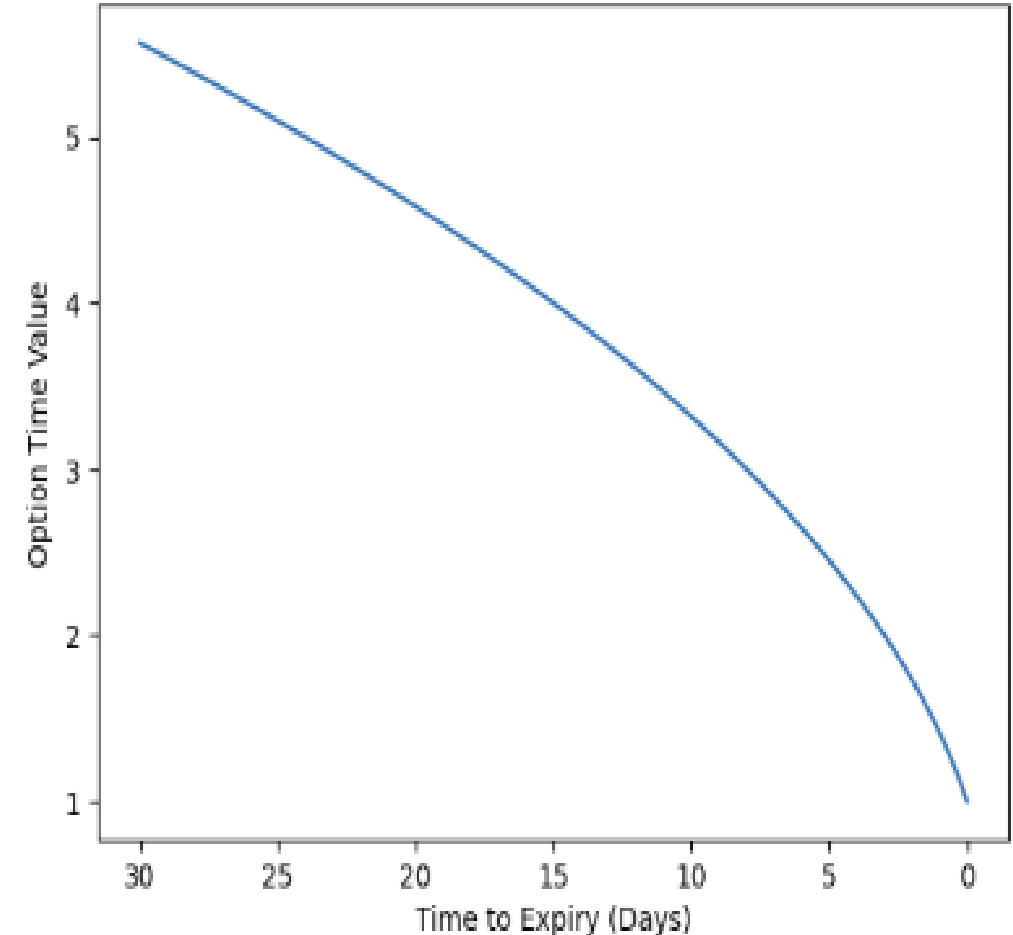
New Delta = $0.50 - 0.0725 = 0.42$



Theta

- Theta measures time decay in an option's price.
- It shows how much an option's value decreases with the passage of one day, assuming other factors remain constant.
- Theta is usually negative for option buyers, meaning the option loses value over time
- Theta is positive for option sellers, because they benefit from time decay
- At-the-money (ATM) options have the highest Theta decay
- Time decay accelerates as the option approaches expiry
- Out-of-the-money (OTM) options lose value quickly near expiry if the price does not move favorably.
- Short-term options experience faster Theta decay than long-term options

Conceptual Theta Decay (Time Value Decreases Faster Near Expiry)



- Vega measures the sensitivity of an option's price to changes in implied volatility (IV).
- It shows how much the option premium will change when implied volatility changes by 1%.
- Higher Vega means the option price is more affected by volatility changes.
- Lower Vega means volatility has less impact on the option price.
- Long options (buying calls or puts) have positive Vega, meaning they benefit when volatility increases.
- Short options (selling calls or puts) have negative Vega, meaning they benefit when volatility decreases.

Vega : Example

Option premium = ₹120

Vega = ₹1.5

If Implied Volatility rises by 2%:

New premium change = ₹1.5 × 2 = ₹3

New option price ≈ ₹123

If Implied Volatility falls by 2%:

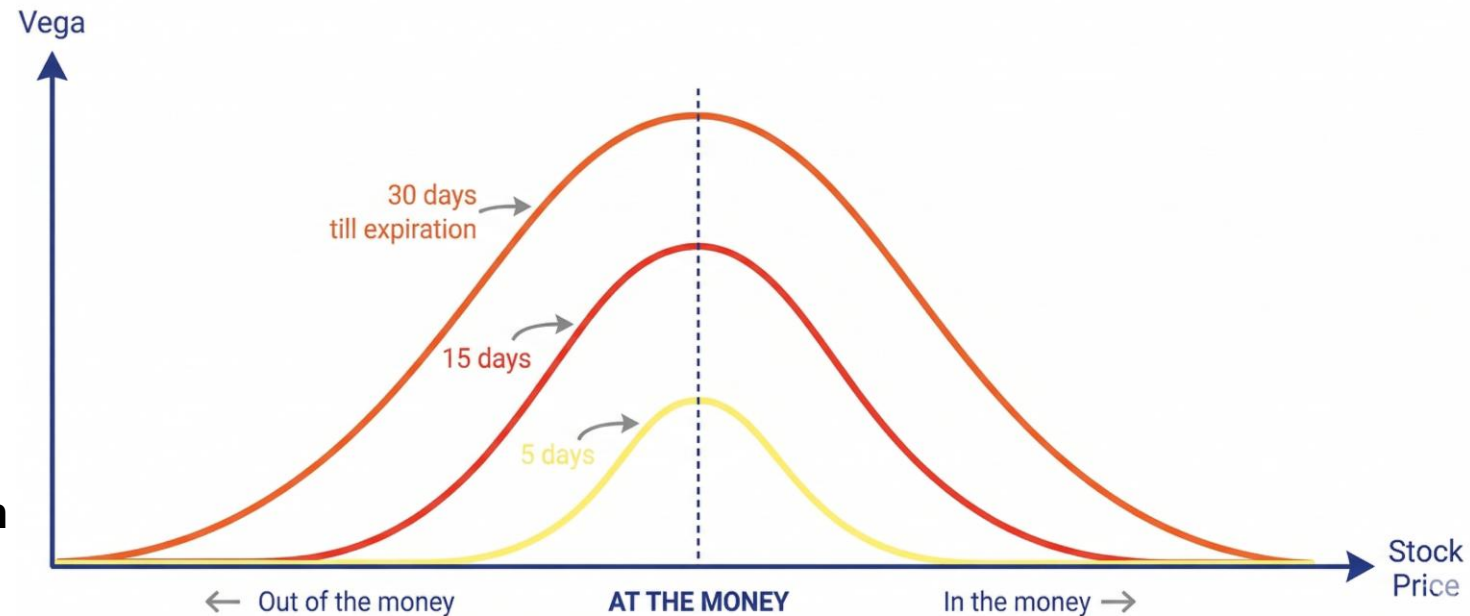
Option price ≈ ₹117

Simple Formula

Change in Option Price = Vega × Change in Implied Volatility

Example:

₹1.2 × 3% IV change = ₹3.6 change in option premium



Q&A

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