Options Greeks at a glance

Delta | Gamma | Theta | Vega | Rho

Price, curvature and time

How does an option value respond when price, time, IV or rates change?

Delta

MEASURES

How much the option price moves when the underlying price changes.

UNIT

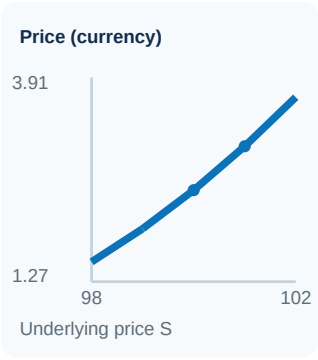
Option price per +1 underlying price unit; a local estimate.

CALL / PUT · LONG / SHORT

Long call: positive; long put: negative. Short reverses the sign.

NUMERIC EXAMPLE

Call: Delta = 0.534. At +1, model value moves from 2.451 to 3.020 (+0.569; Delta is a local estimate).



Gamma

MEASURES

How much Delta changes as the underlying price moves.

UNIT

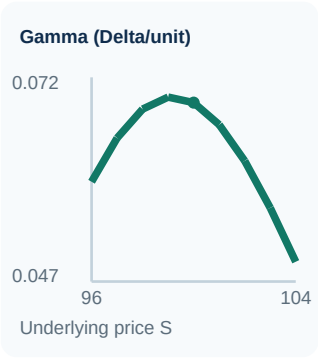
Delta change per +1 underlying price unit.

CALL / PUT · LONG / SHORT

Long calls and puts: positive Gamma; short calls and puts: negative.

NUMERIC EXAMPLE

Gamma = 0.0693. At +1, call Delta moves from 0.534 to about 0.602 (repriced exactly).



Theta

MEASURES

How the option value changes as time passes.

UNIT

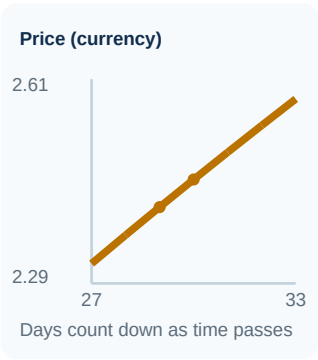
Option price per calendar day (365 days/year), other inputs held constant.

CALL / PUT · LONG / SHORT

Long Theta is often negative, but can be positive for some options and inputs; short is the reverse.

NUMERIC EXAMPLE

Call Theta = -0.0436/day. After one day, model value falls from 2.451 to 2.407 (-0.0439).



Worked example and assumptions

Black–Scholes model: European vanilla option, S = K = 100, 30 days to expiry, IV 20% p.a., continuously compounded risk-free rate 4% p.a., dividend yield q = 0. Prices use the same currency as S and K, for one option unit with no contract multiplier. Charts show quantitatively scaled model values. Inputs change one at a time; market prices can differ.

Options Greeks at a glance

Delta | Gamma | Theta | Vega | Rho

Volatility, rates and comparison

How does an option value respond when price, time, IV or rates change?

Vega

MEASURES

How strongly option value responds to a change in implied volatility.

UNIT

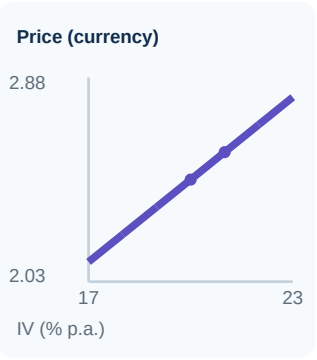
Option price per +1 IV percentage point (e.g. 20% to 21%); IV is annualized.

CALL / PUT · LONG / SHORT

Long standard calls and puts: positive Vega; short: negative.

NUMERIC EXAMPLE

Vega = 0.1140 per IV point. From 20% to 21%, the call rises from 2.451 to 2.565 (+0.114).



Rho

MEASURES

How strongly option value responds to a change in the risk-free interest rate.

UNIT

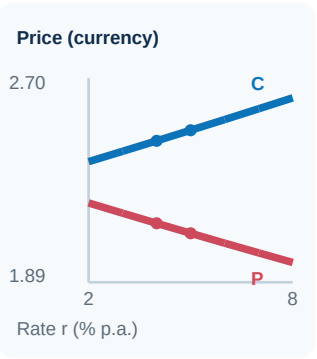
Option price per +1 percentage point in the annualized rate (4% to 5%).

CALL / PUT · LONG / SHORT

With q = 0: long call Rho is positive, long put Rho negative; short reverses both.

NUMERIC EXAMPLE

Call Rho = +0.0419. From 4% to 5%, the call rises from 2.451 to 2.493 (+0.042).



What moves option value?

Local effect for a long option under the assumptions above. Short positions reverse the effects.

Input change	Long call	Long put	Condition / reading
Underlying +1	**usually +**	**usually -**	Direction follows Delta; size depends on moneyness, time and other inputs.
1 calendar day passes	**often -**	**often -**	Sign follows Theta; rates, dividends and time to expiry can change it.
IV +1 percentage point	**+**	**+**	Long vanilla options have positive Vega; higher IV raises model value.
Rate +1 percentage point	**+**	**-**	Rho with q = 0; expiry, strike and rate level affect the size.

Greeks measure isolated, local sensitivities. Large or simultaneous changes can produce a different price move. Gamma changes Delta; volatility, time and rates act together.