



Webinar Presentation

Options Greeks Demystified

BROKERAGE: OPTIONS





Agenda



Get to Know the Greeks

Greeks: What are they?

In simplest terms, Greeks give traders a theoretical way to judge exposure to various options pricing inputs.



Delta



Gamma



Vega



Theta



Rho

Greeks: What do they tell you?

In simplest terms, Greeks give traders a theoretical way to judge exposure to various options pricing inputs.



Delta

A measure of the rate of change in an option's theoretical value for a one-unit change in the price of the underlying security.



Gamma

A measure of the rate of change in an option's delta for a one-unit change in the price of the underlying.



Vega

A measure of the rate of change in an option's theoretical value for a one-unit change in implied volatility.



Theta

A measure of the rate of change in an option's theoretical value for a one-unit change in time to the option's expiration date.



Rho

A measure of an option's theoretical sensitivity to changes in the risk-free interest rate.

Extrinsic Value



Options Greeks affect only extrinsic value (time value) of an option

Strike	Bid	Ask	Intrinsic Value	Time Value
64	10.75	11.00	10.72	0.155
64.5	10.25	10.50	10.22	0.155
65	9.75	10.00	9.72	0.155
65.5	9.30	9.50	9.22	0.18
66	8.80	9.05	8.72	0.205
66.5	8.35	8.55	8.22	0.23
67	7.85	8.10	7.72	0.255
67.5	7.40	7.60	7.22	0.28
68	6.95	7.15	6.72	0.33
68.5	6.50	6.70	6.22	0.38
69	6.05	6.25	5.72	0.43
69.5	5.60	5.75	5.22	0.455
70	5.25	5.30	4.72	0.53
70.5	4.80	4.90	4.22	0.605
71	4.40	4.45	3.72	0.705
71.5	4.05	4.10	3.22	0.855
72	3.65	3.75	2.72	0.98
72.5	3.30	3.40	2.22	1.13
73.5	2.70	2.72	1.22	1.49
74	2.42	2.43	0.72	1.705
74.5	2.15	2.16	0.22	1.935
75	1.90	1.91	0.00	1.905
76	1.46	1.48	0.00	1.475
77.5	0.96	0.97	0.00	0.965
80	0.44	0.46	0.00	0.445
82.5	0.20	0.21	0.00	0.205
85	0.10	0.11	0.00	0.105
90	0.02	0.03	0.00	0.025



Delta



Delta can be used to tell you how much your option contract's price will change based on a dollar move in the underlying. It can also give you share equivalency or an approximation of the probability that the option contract will expire in or out of the money.

Example

A long call with a delta of 50; should move approximately \$0.50 with a \$1.00 move in the underlying.

This is the equivalent of being long 50 shares of the underlying and has a 50% chance of being in or out of the money at expiration.

Gamma



Gamma tells you how much the delta should change based on a \$1 move in the underlying. All other Greeks are measured in dollars—but **gamma is measured in delta.**



Example

If your at-the-money call contract has a delta of 50 and a gamma of 10, and the stock moves up \$1 (all else being equal), your option should now have a delta of 60 and a lower gamma of ~7.

The gamma will decrease in this example, because now the Gamma doesn't have to work as hard to get delta to 0 or 100 at expiration.

Vega



Vega tells you how much the options contract's value should change based on a one-percentage-point change in **Implied Volatility (IV)**.

Example

If you have a vega of 0.05, your option's price should gain or lose \$0.05 for a one-percentage-point change in IV, all else being equal.

IV is the "X factor" in options pricing. If there is more demand for an option, IV should increase, and therefore so will the option's prices. If there is less demand for an option, IV should decrease, and thus the option's prices should decrease as well. Again, remember that a change in IV should directly affect the option's price, but it will also affect all the Greeks.

Theta



Theta tells you how much the options contract's value should change based on one day's **passage of time**.

Example

If you have a theta of 0.05, your option's price will theoretically lose ~\$0.05 for one day's time passage, all else being equal.

Greeks are not static! A \$0.05 loss today could be significantly different the next day/week/month. At-the-money options experience nonlinear time decay, and the decay accelerates around the last 30–45 days of the contract's life.

Rho



Rho tells you how much the options contract's value should change based on a one-percentage-point-change in **Interest Rates**.

Example

If you have a rho of 0.10, your option's price should gain or lose \$0.10 for a one-percentage-point change in interest rates, all else being equal.

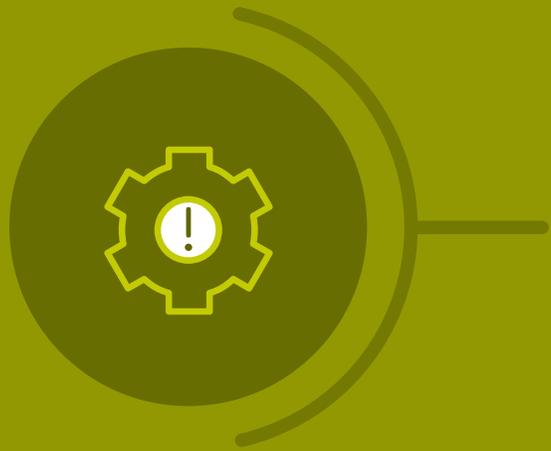
Interest rates can move gradually (e.g., 0.25 percentage points per quarter, meaning that it would take a full year of 0.25-percentage-point rises to equal 1%). This is why LEAP options traders are generally the most concerned with rho.

Greeks



Greeks do not work in a vacuum. A change in one can affect **all** the other Greeks.

Delta	Gamma	Vega	Theta	Rho
CALLS				
0.9563	0.0397	0.0003	-0.0089	0.0001
0.8847	0.1045	0.0007	-0.013	0.0002
0.7833	0.2344	0.0012	-0.0132	0.0002
0.5828	0.6081	0.0016	-0.0092	0.0003
0.3734	0.4477	0.0016	-0.0108	0.0002
0.2936	0.3274	0.0014	-0.0119	0.0002
0.2387	0.264	0.0013	-0.0119	0.0001
0.2213	0.2226	0.0012	-0.0128	0.0001



Understand How to Plan Options Trades

Greeks



How can the Greeks help you **plan** a trade?

The Greeks give you a way to measure the theoretical exposure of an option or options strategy to the various risks it is exposed to. Not only do Greeks help you understand these risks but they can help you tailor a trade to your outlook.

Consider this

You want to minimize your exposure to **directional movement**.

What do you do?

Greeks

How can the Greeks help you **plan** a trade?

- You may consider using the Greek delta to plan a trade with as close to zero delta as possible.
- It can be very difficult, or even impossible, to completely neutralize some exposures, but the Greeks can help you measure how much theoretical exposure you will have.

Strategy	Theo P/L	Qty	Bid	Ask	Eval Price	Delta
▼ Straddle: Jun 17 2016 30/30	-0.81 <small>SIM</small>		1.12	1.18	1.14	4.478
Jun 17 2016 30 Call	-2.026	-1	0.51	0.54	0.52	-47.933
Jun 17 2016 30 Put	1.221	-1	0.61	0.64	0.62	52.41
Summary	-0.81					4.478



Understand How to Manage Options Trades

Greeks

How can the Greeks help you **manage** a trade?

- You can use the Greeks to help assess your theoretical exposure.
- By looking at what our delta has become over time, we can see how directional exposure has changed.
- We can use that information to determine whether you want to adjust the trade (and therefore the delta) or leave it alone.

Greeks

How can the Greeks help you **manage** a trade?

Original Delta Exposure:

Strategy	Theo P/L	Qty	Bid	Ask	Eval Price	Delta
▼ Straddle: Jun 17 2016 30/30	-0.81		1.12	1.18	1.14	4.478
Jun 17 2016 30 Call	-2.026	-1	0.51	0.54	0.52	-47.933
Jun 17 2016 30 Put	1.221	-1	0.61	0.64	0.62	52.41
Summary	-0.81					4.478

You started with **positive 4.478** delta, and now you are at **negative 51.922** delta.

New Delta Exposure:

Strategy	Theo P/L	Qty	Bid	Ask	Eval Price	Delta
▼ Straddle: Jun 17 2016 30/30	77.28		1.12	1.18	1.14	-51.922
Jun 17 2016 30 Call	20.912	-1	0.51	0.54	0.52	-76.496
Jun 17 2016 30 Put	56.369	-1	0.61	0.64	0.62	24.573
Summary	77.28					-51.922

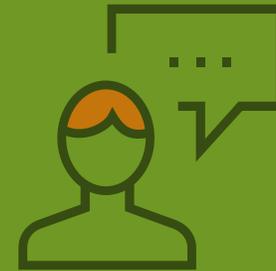
Is this still a trade you want to be in?

Greeks

In Summary

- Greeks can help you examine your exposure to various option-centric risks.
- Greeks are dynamic and constantly changing.
- Greeks can help you plan your trades to take advantage of, or avoid/minimize, the effects of these risks.
- Greeks can help you manage your trades by showing how the trade's various exposures have changed regarding:
 - Time (Theta)
 - Price (Delta/Gamma)
 - Volatility (Vega)
 - Interest Rates (Rho)

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