Options Fundamentals Ep 4

Demystifying the Greeks: Delta

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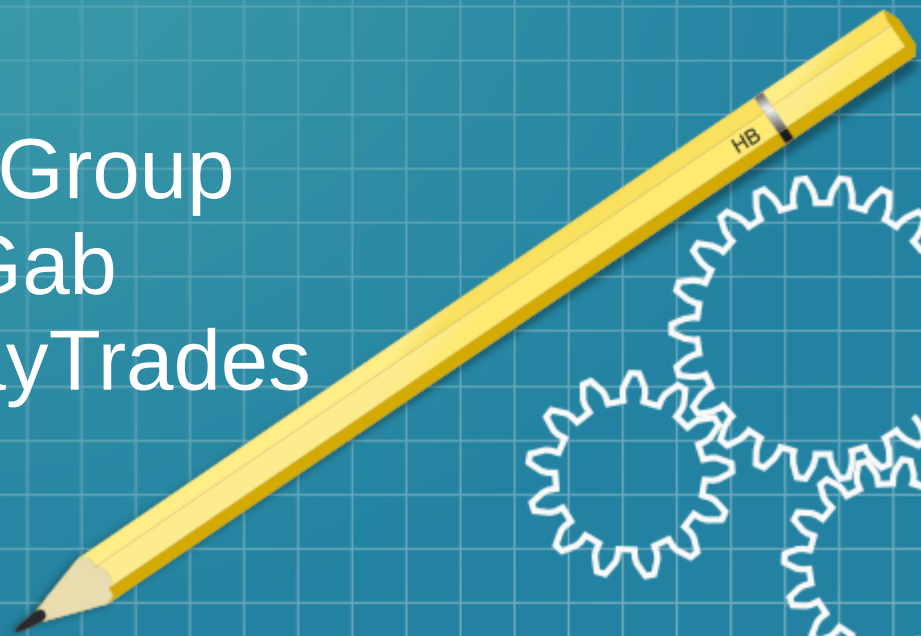

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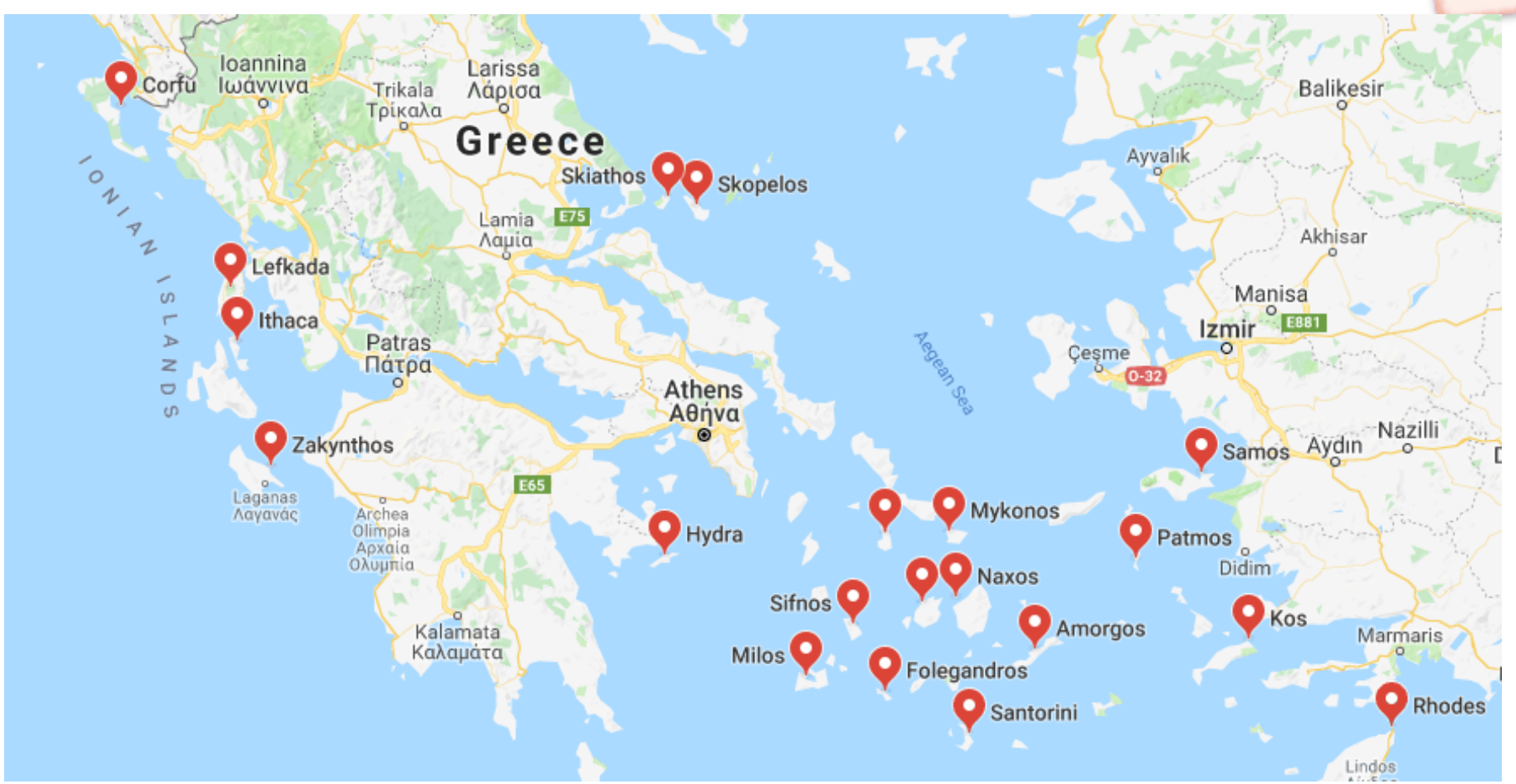
The Greeks?


Corfu
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Ιωάννινα
Trikala
Τρίκαλα
Larissa
Λάρισα
Greece
Skiathos
Skopelos
Lamia
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E75
IONIAN ISLANDS
Lefkada
Ithaca
Patras
Πάτρα
Athens
Αθήνα
Zakynthos
Laganas
Λαγανάς
Archea Olimpia
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E65
Hydra
Kalamata
Καλαμάτα
Aegean Sea
Balikesir
Ayvalık
Akhisar
Manisa
Izmir
E881
Çeşme
O-32
Nazilli
Aydın
Samos
Mykonos
Patmos
Didim
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Folegandros
Santorini
Rhodes
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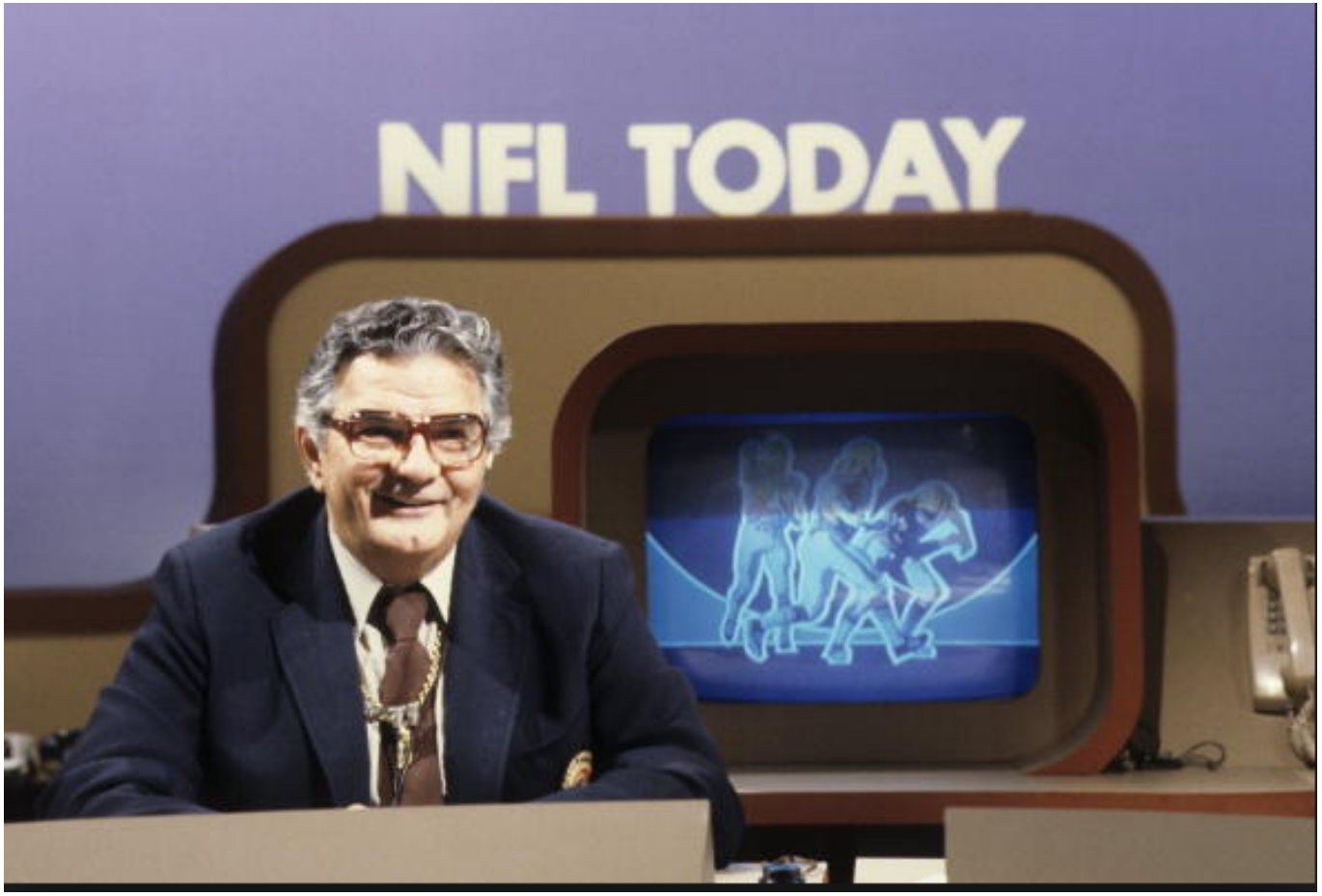
The Greeks?

The Greeks?



The Greeks!

- The Greeks are parameters in theoretical options pricing models
- These parameters are named after Greek letters (most real, one fake)
- Real prices are set by buyers and sellers in the market place
- Pricing models give us an idea of how the price of an option should move in theory given factors like:
  - The price of the underlying
  - Volatility
  - Time Decay
  - Cost to Carry
- **These pricing models help traders understand the risks being taken by a trade at a given time and over the life of the trade.**

Delta: Formal Definition

- Delta measures how much the price of an option should move if the underlying moves 1 point.
- It is expressed as a decimal value from 0 – 1
  - This makes sense as an option is a derivative of the underlying stock. It should never move more than the stock otherwise why buy the stock?
  - The more an option is ITM, the higher the delta should be

Delta: Informal Definition

- Traders also view delta as the probability that an option contract will expire ITM
- This makes sense because:
  - Probability is also expressed as a decimal value between 0 and 1
  - The value gets higher as the option goes further ITM

Delta Exercise

- Stock XYZ is trading at $60
- I buy a $60 call 60 days out for $2.00
- After I buy it, the stock moves to $61
- Considering only delta, where should my option be priced?
- A) $2.00
- B) $2.25
- C) $2.50
- D) $3.00

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Delta Exercise

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- After I buy it, the stock moves to $61
- Considering only delta, where should my option be priced?
- C) $2.50
- Why?
  - If an option is exactly ATM, then the probability of expiring ITM is 50% (or .50). That should be the delta
  - Therefore, if the underlying moves up $1, the option should move up $.50
- It works for the opposite direction too
  - If XYZ moves to $59, delta would price my call option at $1.50

How Delta Moves

- Delta doesn’t necessarily move in a straight line.
- The probability definition of delta explains this
  - As the underlying moves more ITM, the price probability gets higher and the price of the underlying goes higher

Delta Example: Calls

AAPL | APPLE INC COM | 152.70 | -1.22 -0.79% | B: 152.37 A: 152.60 | ETB | NASDAQ

Underlying

Last X	Net Chng	Bid X	Ask X	Size
152.70 Q	-1.22	152.37 Q	152.60 P	1 x 25

Trade Grid

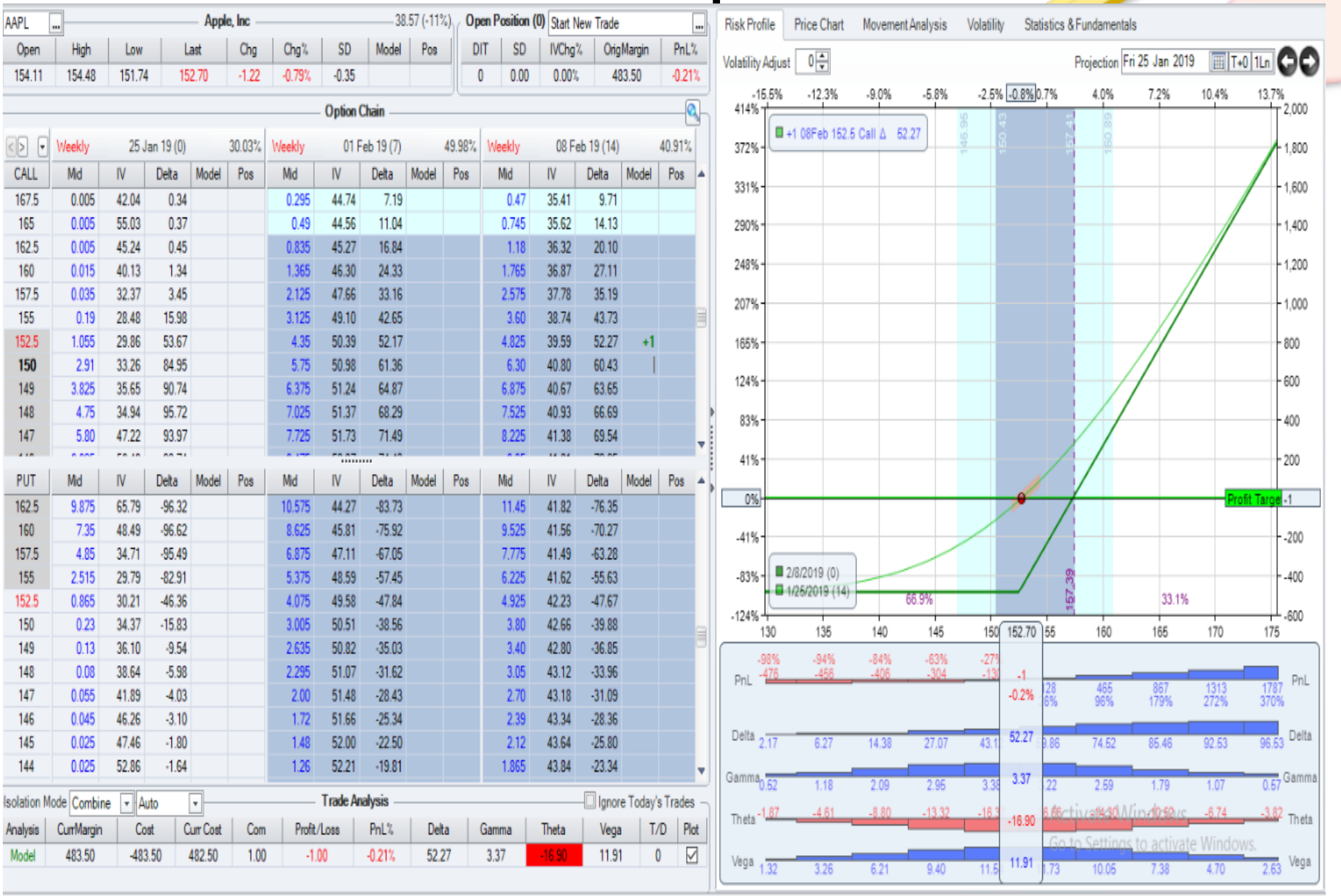
Option Chain | Filter: **Off** | Spread: **Single** | Layout: **Last X, Net Change, Impl Vol, Delta**

Strikes: 30

CALLS

Last X	Net Chng	Impl Vol	Delta	Bid X	Ask X	Exp	Strike
25 JAN 19 (1) 100 **(Weeklys)**							
1 FEB 19 (8) 100 **(Weeklys)**							
8 FEB 19 (15) 100 **(Weeklys)**							
16.80 H	0	44.48%	.89	16.30 Z	16.55 Z	8 FEB 19	137
16.08 X	0	43.46%	.87	15.40 Z	15.60 X	8 FEB 19	138
15.30 Q	+.98	43.05%	.86	14.50 Z	14.75 Z	8 FEB 19	139
13.58 I	-1.14	42.78%	.84	13.65 Z	13.90 Z	8 FEB 19	140
15.40 E	0	41.98%	.83	12.80 Z	13.00 Z	8 FEB 19	141
11.70 A	-2.90	41.61%	.81	11.95 Z	12.20 Z	8 FEB 19	142
11.55 Q	-.40	41.02%	.79	11.15 Z	11.35 Z	8 FEB 19	143
9.90 C	-.40	40.76%	.76	10.40 Z	10.55 Z	8 FEB 19	144
9.55 C	-.25	40.03%	.74	9.60 Z	9.75 N	8 FEB 19	145
10.67 C	0	39.81%	.72	8.85 Z	9.05 Z	8 FEB 19	146
8.10 H	-1.20	39.34%	.69	8.15 Z	8.30 Z	8 FEB 19	147
7.20 H	-.50	38.87%	.66	7.45 Z	7.60 N	8 FEB 19	148
6.65 P	-1.04	38.58%	.63	6.80 Z	6.95 N	8 FEB 19	149
6.00 Z	-.95	38.66%	.60	6.25 Z	6.35 Z	8 FEB 19	150
4.85 A	-.80	37.44%	.52	4.75 Z	4.90 Z	8 FEB 19	152.5
3.60 Z	-.75	36.58%	.43	3.55 Z	3.65 Z	8 FEB 19	155
2.60 P	-.60	35.63%	.35	2.54 Z	2.61 N	8 FEB 19	157.5
1.79 X	-.56	34.74%	.27	1.74 Z	1.79 Z	8 FEB 19	160
1.17 C	-.36	34.19%	.20	1.15 Z	1.21 Z	8 FEB 19	162.5
.74 P	-.28	33.51%	.14	.73 Z	.76 Q	8 FEB 19	165
.45 A	-.17	33.29%	.10	.44 Z	.50 I	8 FEB 19	167.5
.30 Z	-.14	33.43%	.07	.28 C	.32 N	8 FEB 19	170
.20 P	-.06	33.48%	.04	.16 M	.21 N	8 FEB 19	172.5
.14 P	-.04	34.41%	.03	.11 Q	.15 I	8 FEB 19	175
.09 Z	-.03	34.91%	.02	.06 I	.11 X	8 FEB 19	177.5
.06 C	-.02	36.56%	.02	.05 Z	.09 M	8 FEB 19	180
.04 E	0	36.91%	.01	.02 A	.07 C	8 FEB 19	182.5
.04 M	-.02	39.87%	.01	.03 Z	.07 M	8 FEB 19	185
.08 Q	0	41.08%	.01	.03 Z	.05 X	8 FEB 19	187.5
.02 C	-.03	41.90%	.01	0 T	.06 M	8 FEB 19	190

Delta Example: Calls



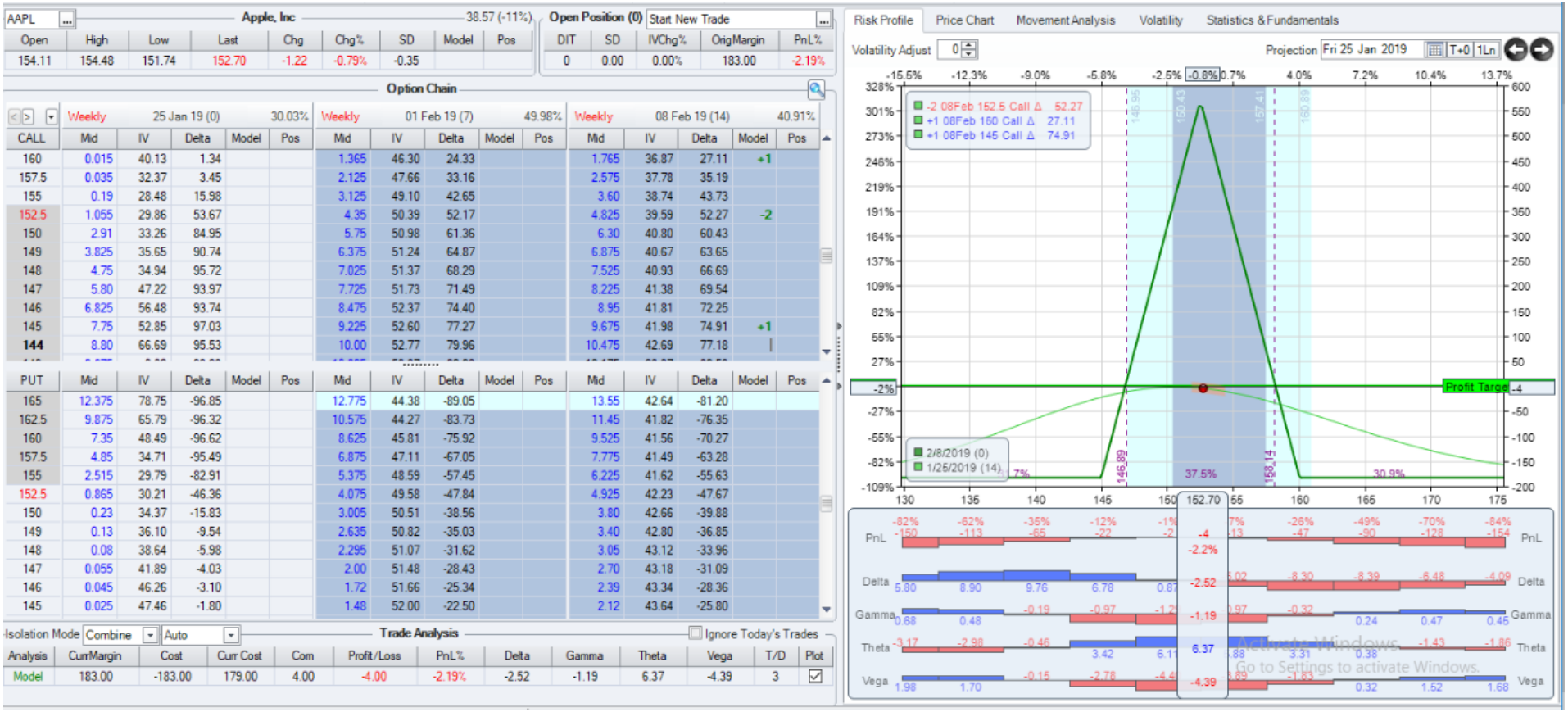
Put Delta

- Call options are always expressed as a positive value
- Put options are always expressed as a negative value
  - This makes sense since a put gets more valuable as the underlying goes lower
  - It is common to speak about delta in terms of absolute value

Using Delta to Measure Risk

- The delta of an option tells us important information about the risk of that option
  - It tells us how much my position will be affected by the movement of the underlying
  - It tells us the probability of my option finishing ITM
  - In complex trades, positional delta tells me the overall risk of my entire trade

Positional Delta



Summary

- Greeks are parameters in options pricing models
- Option pricing models give us a theoretical prediction of how an option position will behave
- Greeks help traders quantify the risk of a position
- Delta is a parameter that measures how a price move in the underlying affects the price of an option.
- Delta also gives a probability of an option expiring ITM
- Position Delta is important to understand, especially for complex positions

Thank you for your time. Let’s keep talking!
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