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OCC / OIC

Gamma Scalping

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Gamma Scalping

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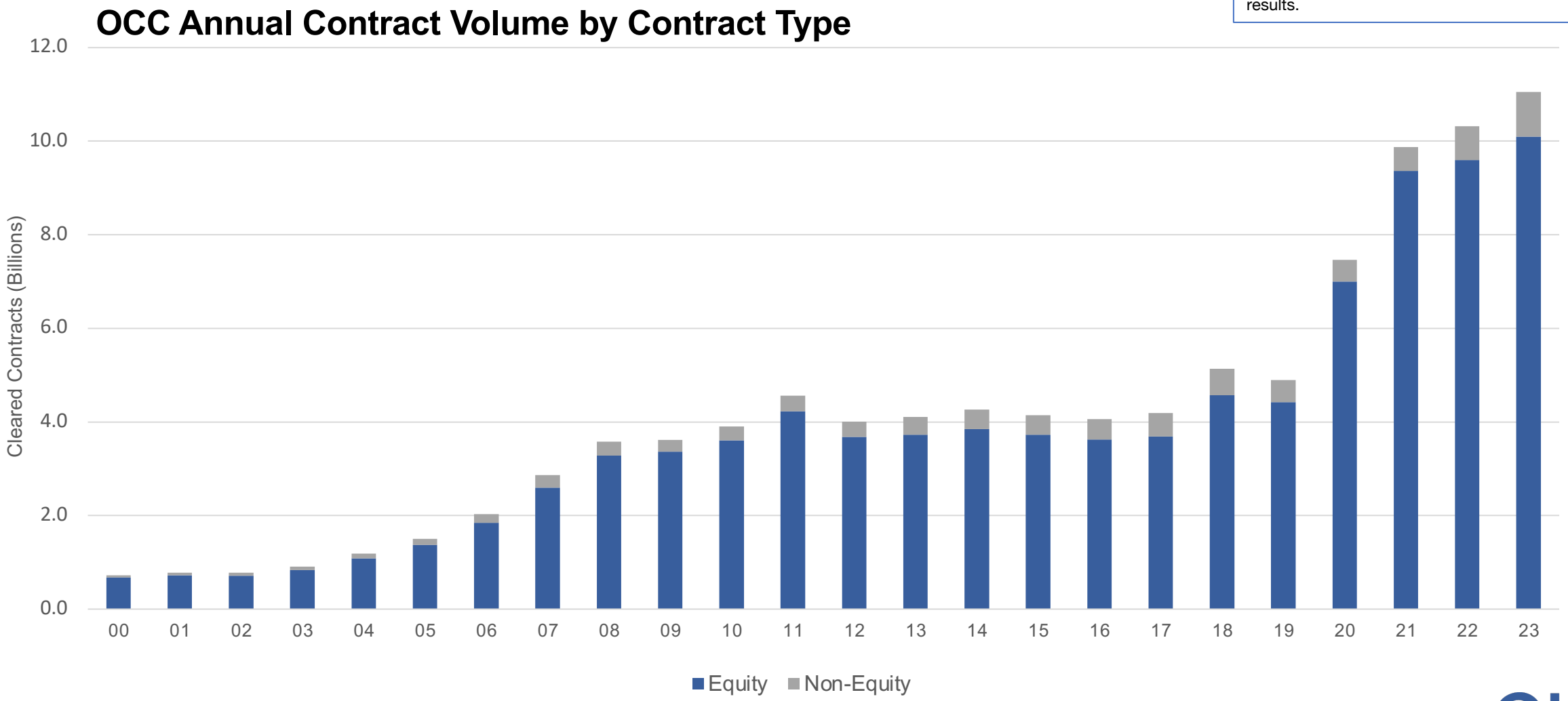


Presentation Outline

- What is Delta
- What is Gamma
- Gamma of Options over Time
- Why Scalp Gamma
- The Mechanics of Gamma Scalping
- Potential Outcomes

- Q & A

Delta of Options

Option Delta – A definition

Delta: Option Value's sensitivity to stock price

The ***expected*** change in an option's price (up or down) for each $1.00 move in underlying security price

Deep in-the-money options

- High Delta approaching 100% (or 1.00)

At-the-money options

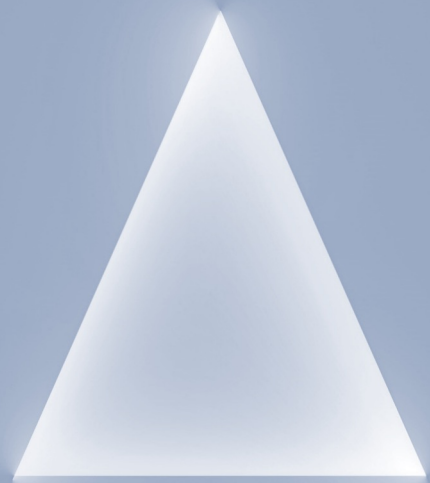
- Deltas around 50% (or .50)

Far out-of-the-money options

- Low Delta approaching 0% (or 0)

What is ‘Hard’ Delta?

- **‘Hard’ Delta Δ**
  - Options with Higher Deltas are generally more likely to correlate their price movement with underlying movement.
  - As expiration approaches, In-the-money options tend toward the upper bound of 100 Delta and Out-of-the-money options tend toward the lower bound of zero Delta.
  - Thus, options closer to expiration, and with higher deltas become more ‘Hard’ deltas – hedging these deltas with underlying assets can ***reduce*** variance as the options begin to correlate more closely with underlying price movement.



What is ‘Soft’ Delta?

- **‘Soft’ Delta Δ**
  - Options with Lower Deltas are generally less likely to correlate their price movement with underlying movement.
  - As expiration approaches, In-the-money options tend toward the upper bound of 100 Delta and Out-of-the-money options tend toward the lower bound of zero Delta.
  - Thus, options with lower Deltas or longer duration are considered more ‘Soft’ Delta – hedging these deltas with underlying assets can ***increase*** overall variance as the options’ Delta or duration profile can potentially keep them from correlating directly with underlying price movement.

Some Examples of ‘Hard’ and ‘Soft’ Delta

XYZ Stock trading $65.00 USD

- **Potential examples of ‘Hard’ Delta**
  - The Stock itself – this is the purest form of ‘Hard’ Delta – each share of stock held can be thought of as hard Delta.
  - ***In – the-money*** options close to expiration
    - 50.00 Strike Call with 10 DTE (95 Delta option)
    - 80.00 Strike Put with 10 DTE (96 Delta option)
- **Potential examples of ‘Soft’ Delta**
  - ***Out-of-the-money*** options
    - 80.00 Strike Call with 30 DTE (10 Delta option)
    - 55.00 Strike Put with 90 DTE (29 Delta option)

What is Gamma?

Option Gamma – A definition

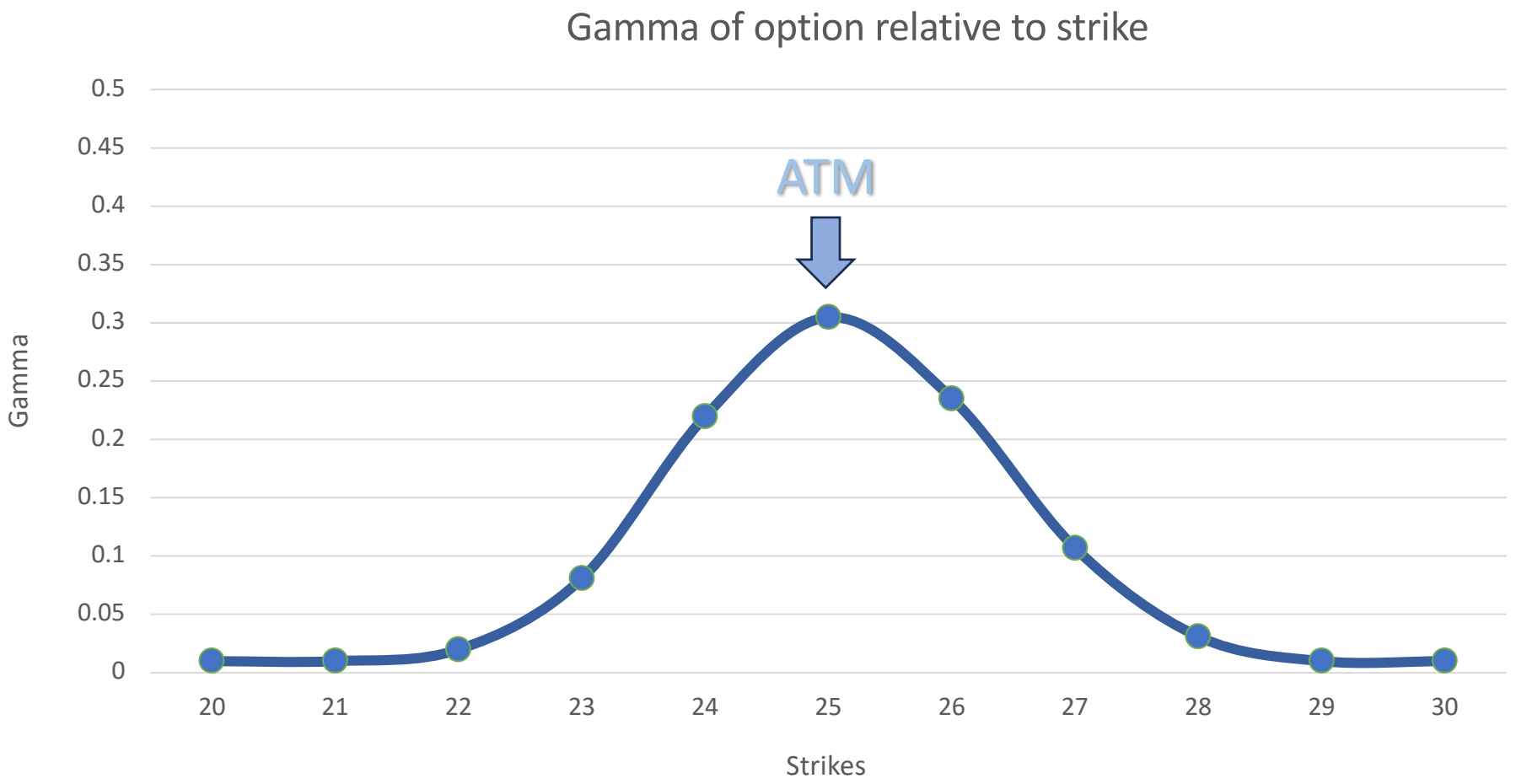
Gamma: Delta's sensitivity to stock price

The anticipated change in the Delta value for a $1.00 move in the underlying security

- All other pricing factors constant
- In decimal form (e.g., .002)
- **Adjustment to Delta**

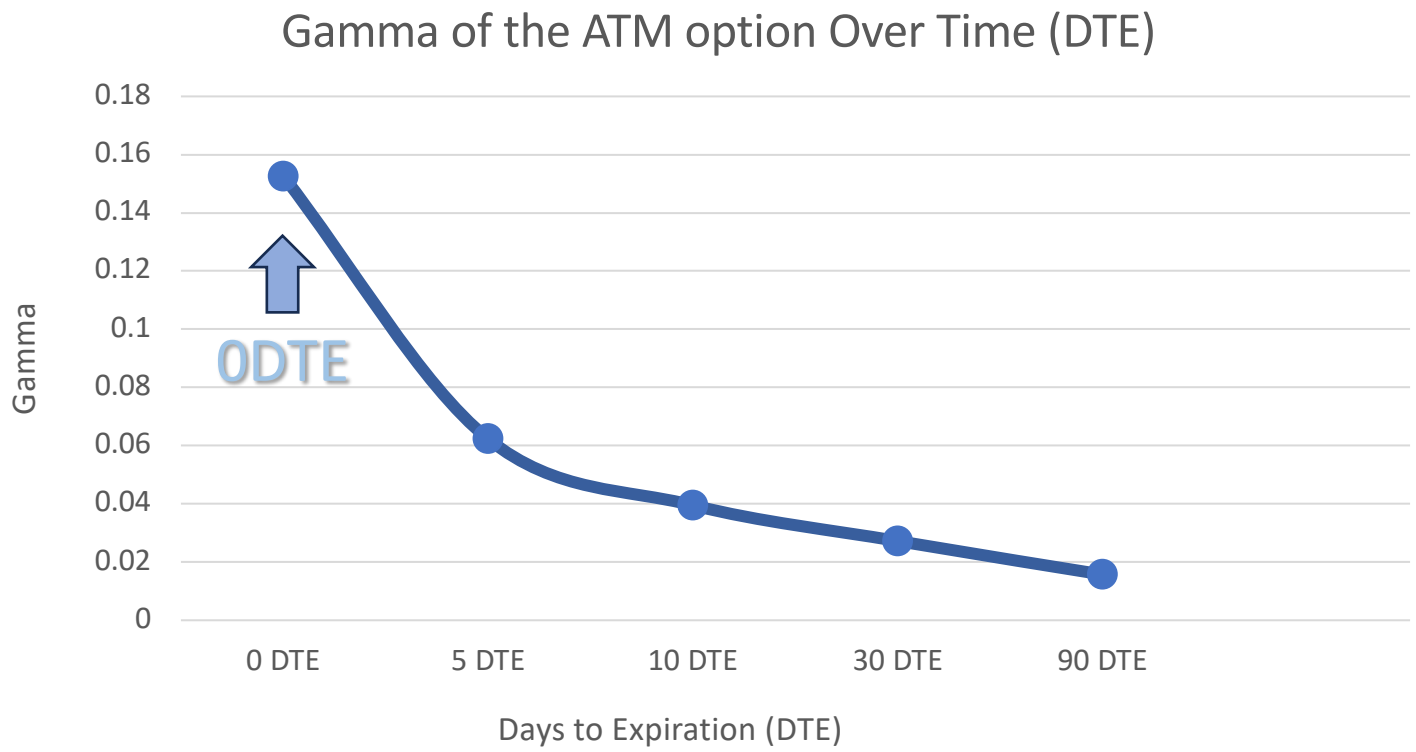
Only options have Gamma

Gamma of Options Across Strikes

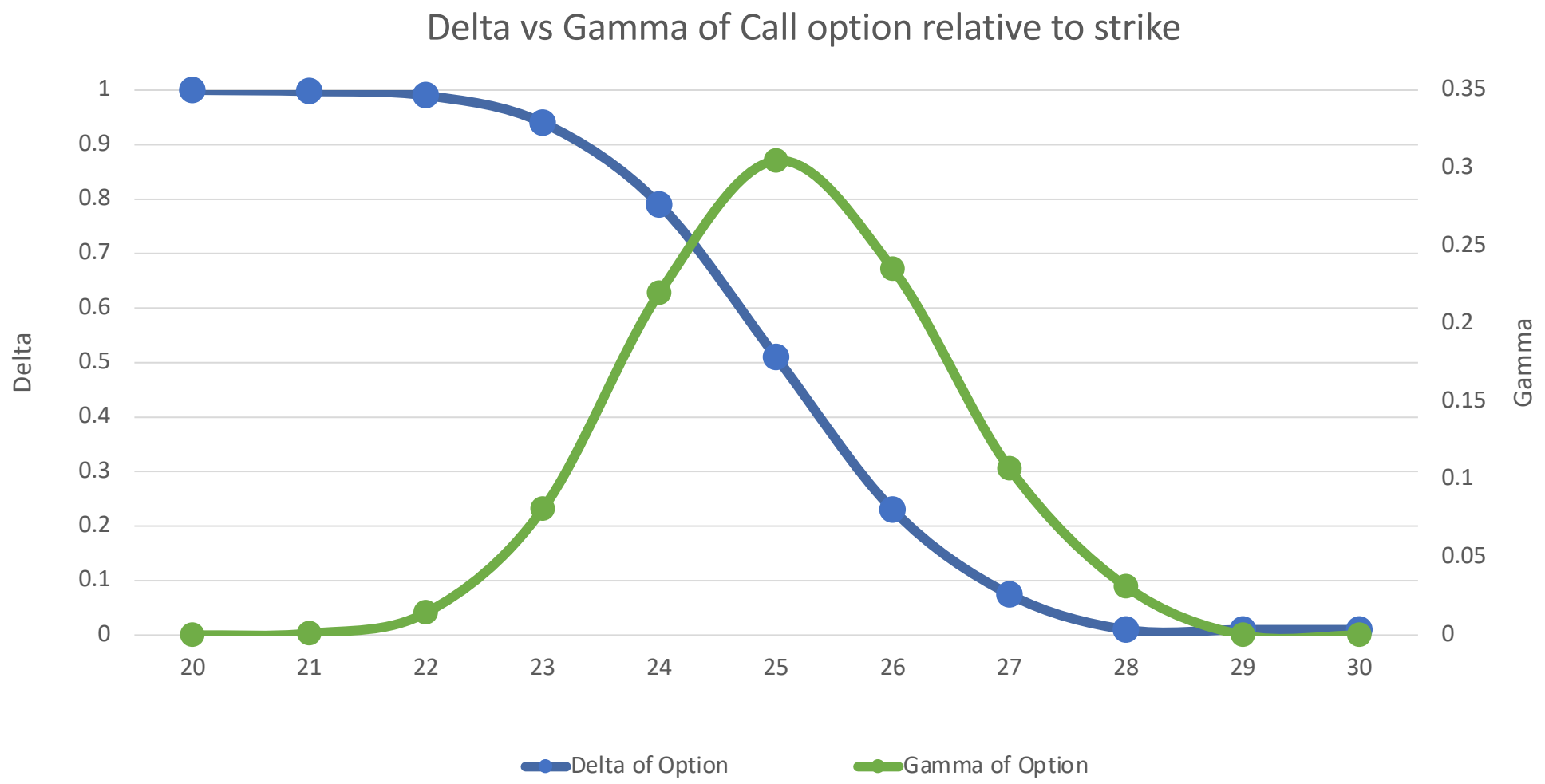


Gamma as a function of Time (Days to Expiration)

	0 DTE	5 DTE	10 DTE	30 DTE	90 DTE
Gamma of the ATM option	.1526	.0623	.0395	.0272	.0157



Delta vs Gamma as a function of strike



Delta Neutral Gamma Hedging

- Mostly employed by professional traders who keep their positions “Delta neutral”
- Process by which traders buy/sell shares of stock to maintain position neutrality as shares increase or decrease in price
- As stock prices change, so does the delta of the option due to gamma
- Changes in deltas can require additional shares to be bought/sold as stock prices fluctuate
- Profit/loss from additional shares is the result of the ‘scalp’
- Don’t forget about time decay!

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The Mechanics of Gamma Scalping

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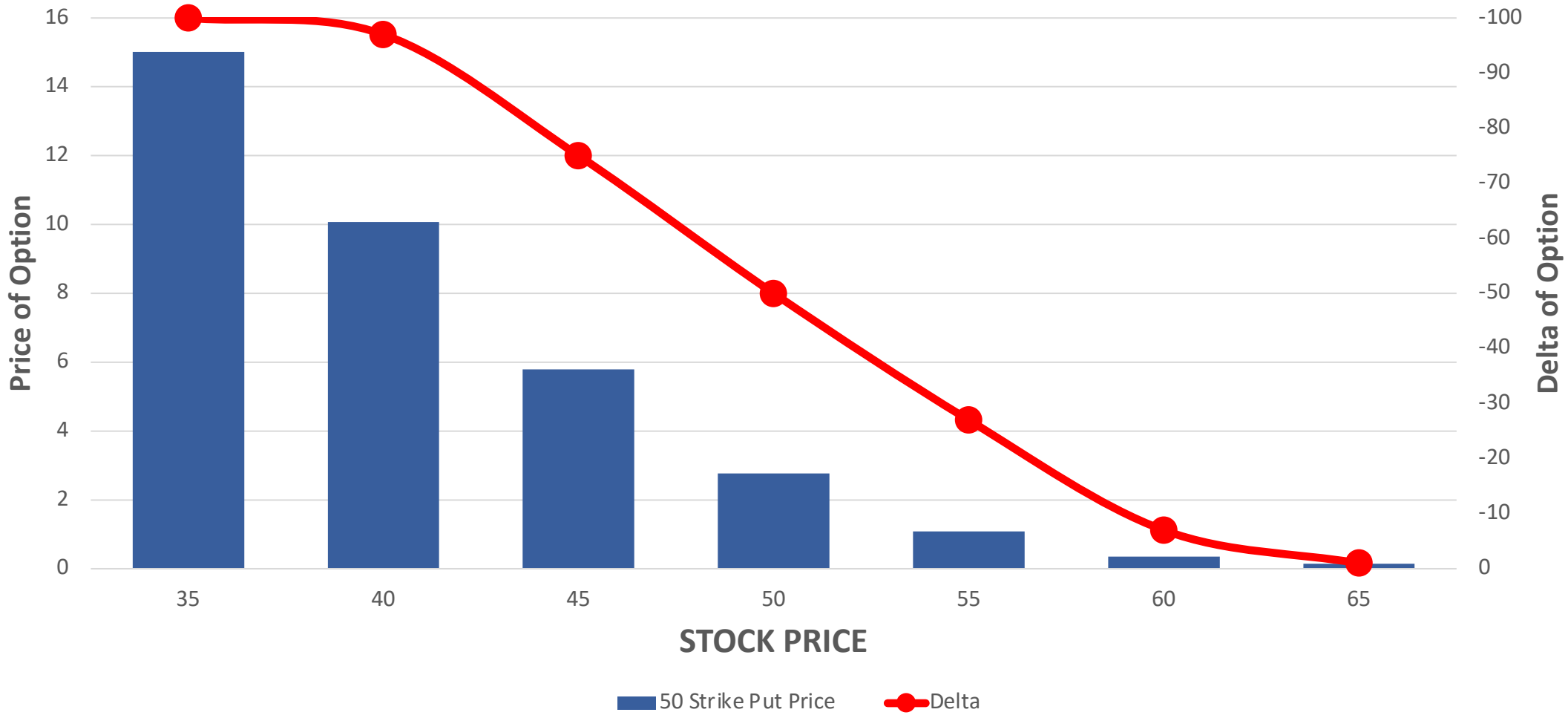
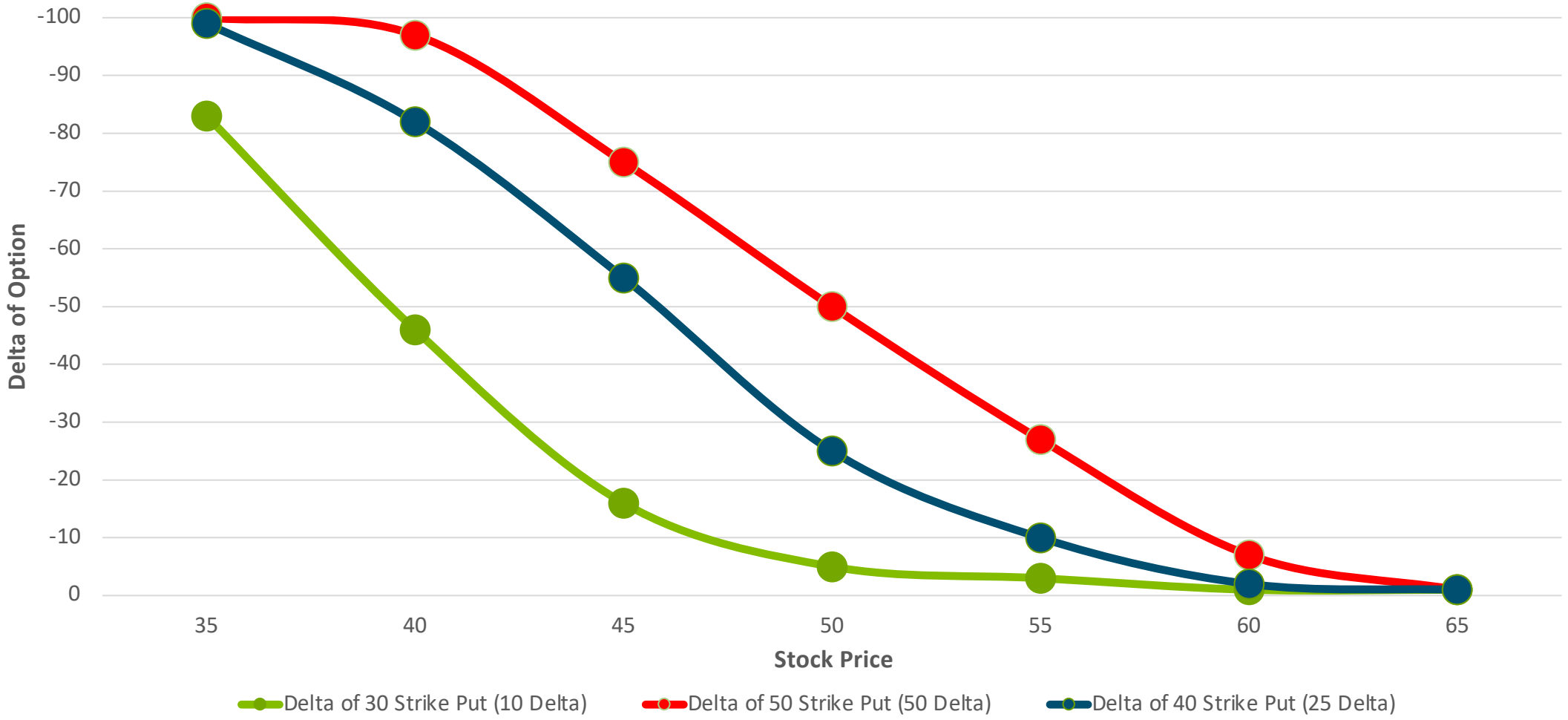
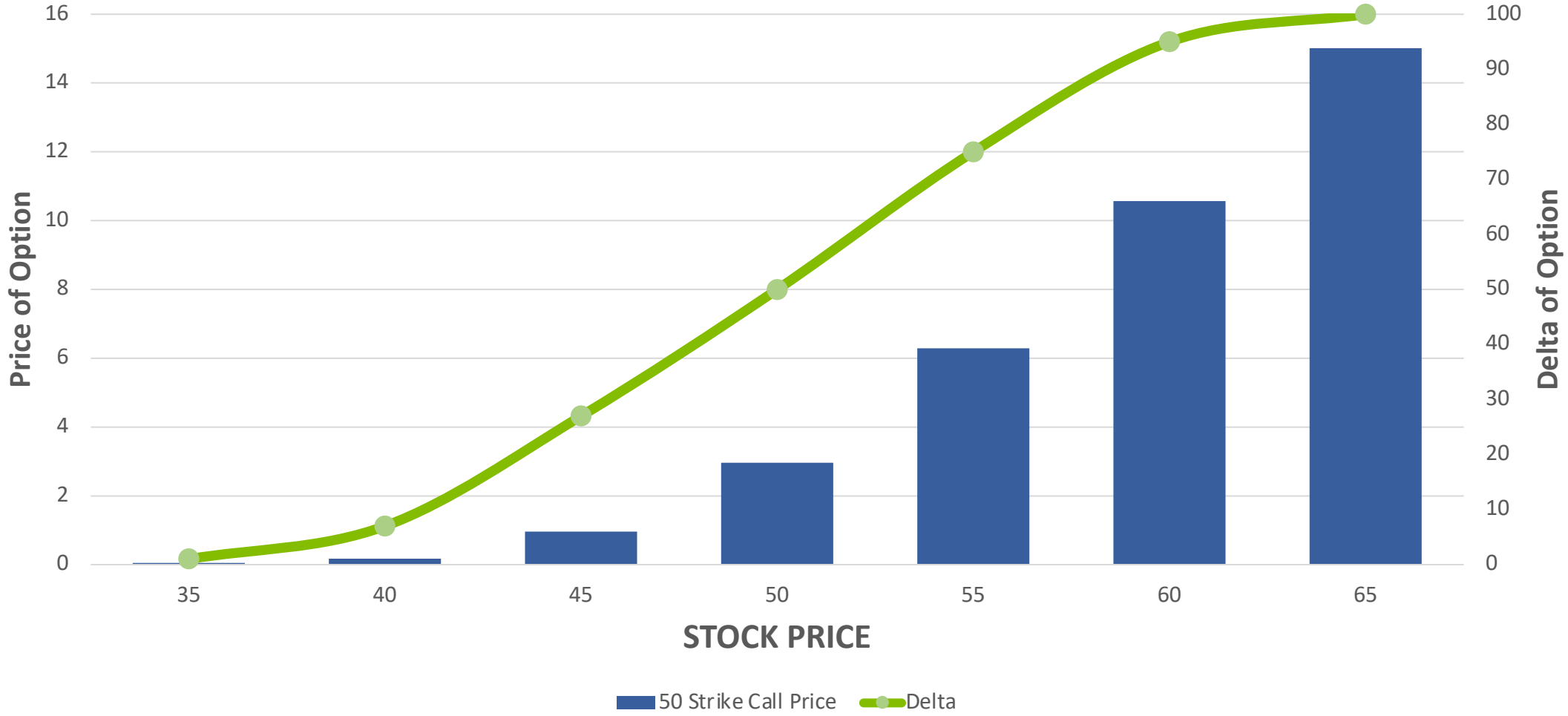
Value and Delta of the At-the-Money Put



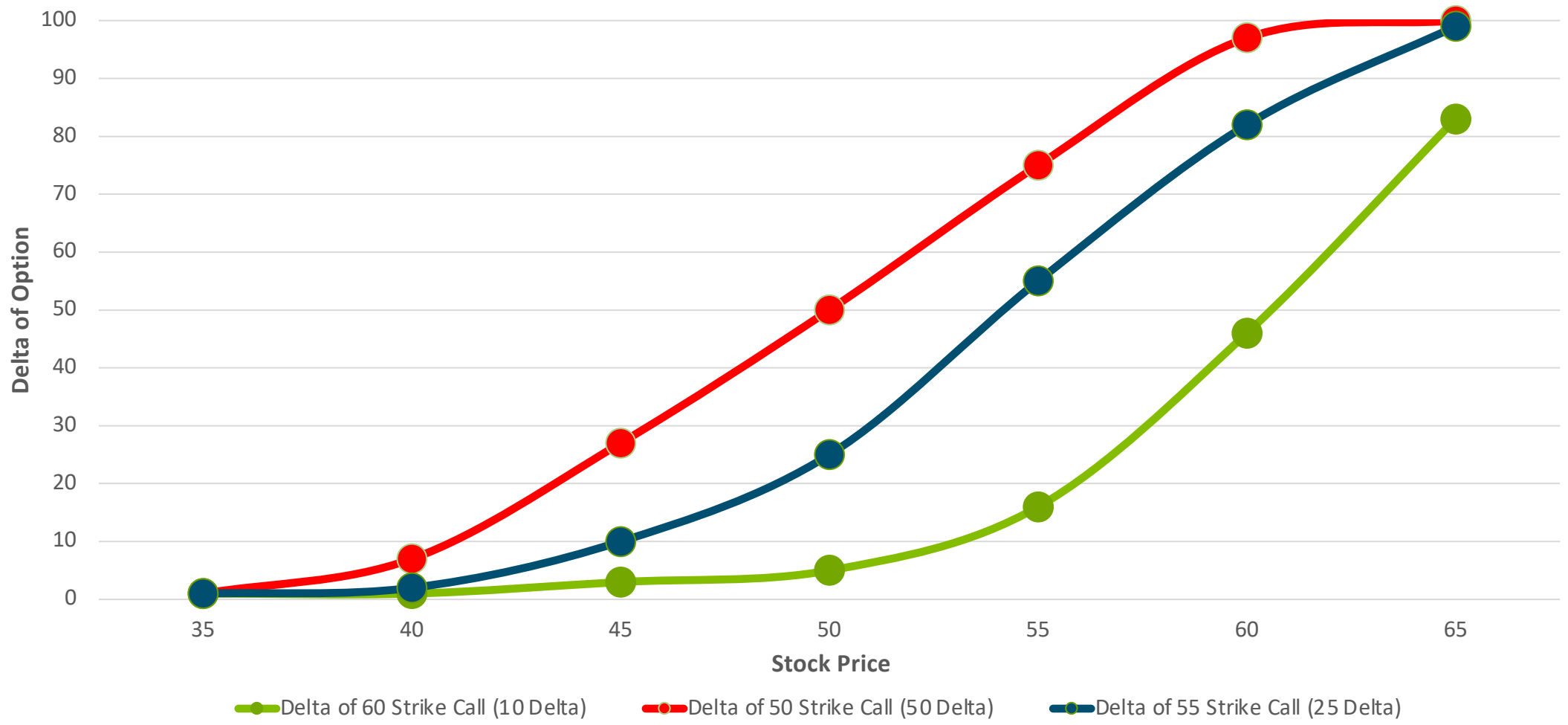
Delta of Various Puts Over a Move



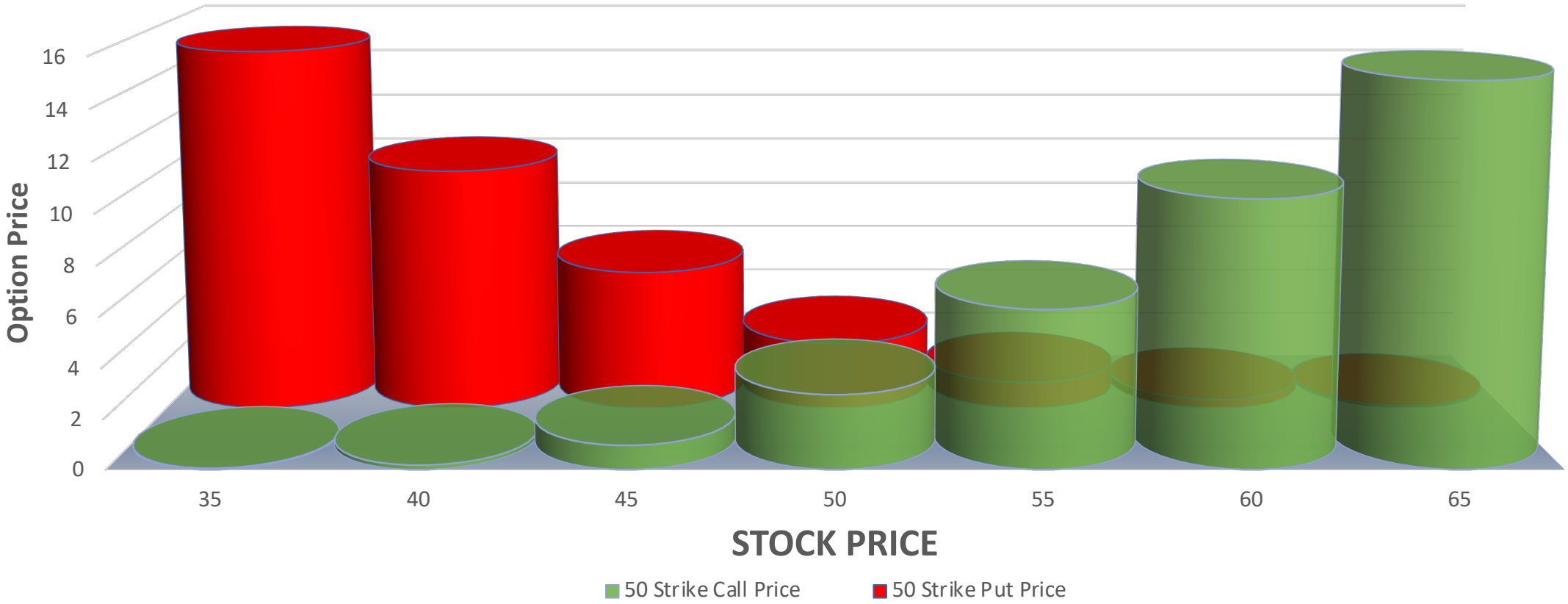
Value and Delta of the At-the-Money Call



Delta of Various Calls Over a Move



At-the-Money Put and Call Together (The Straddle Components)



Potential Outcomes

Potential Outcomes (Assuming Delta Neutral)

Beginning of Day 1

10DTE 50 Delta Call
Underlying $100
Implied Vol: 50%
Call Price: $3.53

Option Delta +50
Stock Position -50
Net Position Delta = 0

+ Stock up $5.00 to $105

Beginning of Day 2

10DTE 50 Delta Call
Underlying $105
Implied Vol: 50%
Call Price: $6.55

Option Delta +74
Stock Position -74
Net Position Delta = 0

- Stock down $5.00 to $100

End of Day 1 Gamma Hedging:

New Call Price: $6.55
New Call Delta: 74 Delta
Option Delta +74
Stock Position -74 (Sold 24 shares)

Net Position Delta = 0

End of Day 2 Gamma Hedging:

New Call Price: $3.33
New Call Delta: 50 Delta
Option Delta +50
Stock Position -50 (Bought 24 Shares)

Net Position Delta = 0

Potential Outcomes (Assuming Delta Neutral)

Beginning of Day 3

8DTE 50 Delta Call
Underlying $100
Implied Vol: 55%
Call Price: $3.33

Option Delta +50
Stock Position -50
Net Position Delta = 0

- Stock down $5.00 to $95

End of Day 1 Gamma Hedging:

New Call Price: $1.30
New Call Delta: 28 Delta
Option Delta +28
Stock Position -28 (Bought 22 Shares)

Net Position Delta = 0

Beginning of Day 4

7DTE 28 Delta Call
Underlying $95
Implied Vol: 58%
Call Price: $1.30

Option Delta +28
Stock Position -28
Net Position Delta = 0

+ Stock up $5.00 to $100

End of Day 2 Gamma Hedging:

New Call Price: $3.23
New Call Delta: 50 Delta
Option Delta +50
Stock Position -50 (Sold 22 Shares)

Net Position Delta = 0

Potential Outcomes (Assuming Delta Neutral)

Recap of Day 1-2

Option Price Change:
$3.53 - $3.33 = -$.20 or
$20.00
Stock Hedges: $5.00 on 24 shares = $120.00

Net P&L = $100.00
(includes theoretical decay and Gamma Scalp P & L)

Recap of Day 3-4

Option Price Change:
$3.33 – $3.23 = -$.10 or
$10.00
Stock Hedges: $5.00 on 22 shares = $110.00

Net P&L = $100.00
(includes theoretical decay and Gamma Scalp P & L)

*These Profit and Loss metrics are based on a hypothetical outcome, and should not be construed as an expected outcome

Potential Outcomes (Risks and Benefits)

- **As Stock Fluctuates in Price**
  - Shares can be bought/sold against the changes in the Delta of the options held.
    - These changes in Delta are a function of the Gamma of that option.
    - Two-sided movement of underlying is optimal in this case, as Delta changes generated by the Gamma of the option allow for hedging opportunities on the buy-side and the sell-side of the underlying market.

HOWEVER

- **Theta of Options**
  - Theta theoretically continues to erode the value of the option as a function of time, irrespective of movement.
    - The underlying movement, if it creates enough Delta change can overwhelm the decay of the option, in price terms, if the move is large enough.

Investors must weigh both the forces of theta (decay) of the option over time vs. expected underlying movement and gauge whether those forces are balanced, or if one side of that equation presents a compelling value that aligns with their market view.

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