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Options Premium:
Intrinsic, Extrinsic and the Forces That Shape Value

Mathew Cashman
Principal, OCC & Instructor,
The Options Industry Council

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Options Premium: Intrinsic, Extrinsic and the Forces That Shape Value

Mat Cashman

Principal / Investor Education / OCC

Instructor / The Options Industry Council (OIC)

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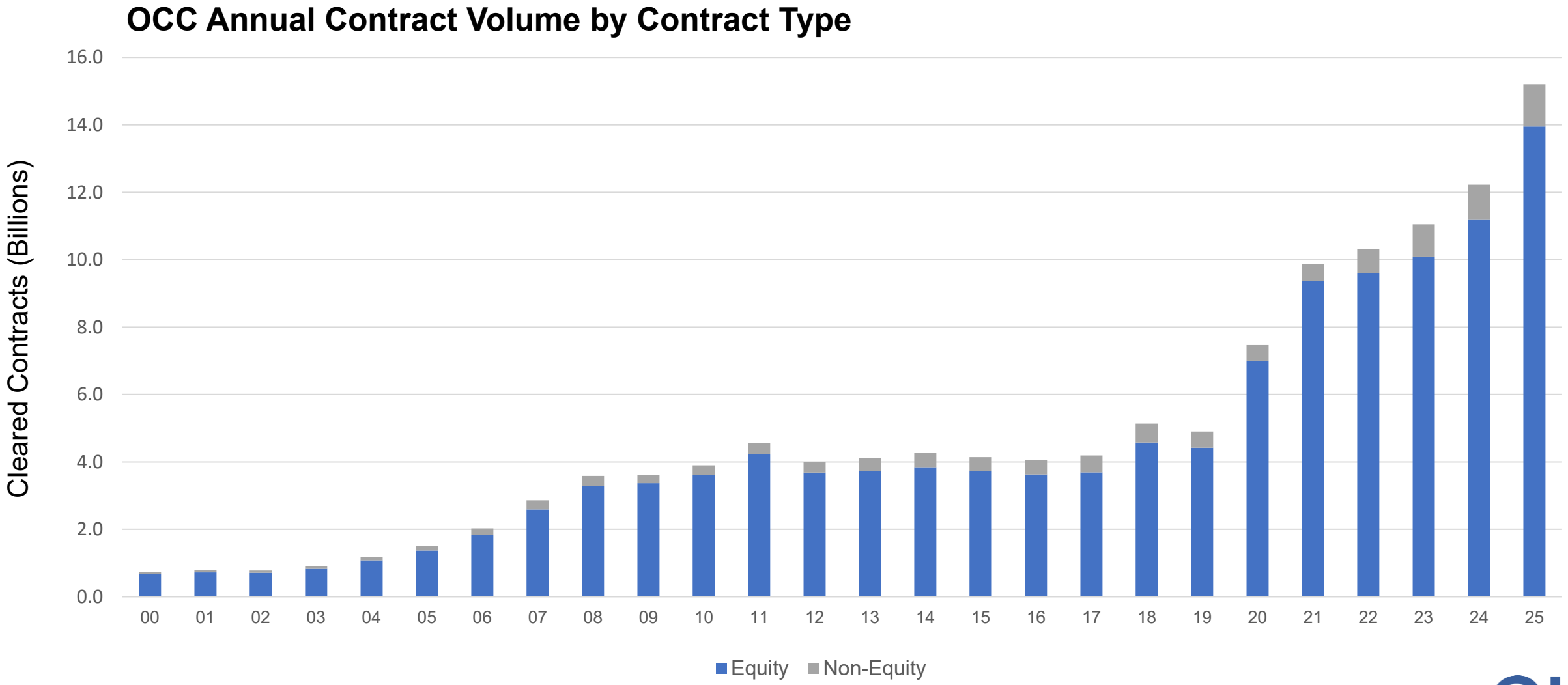
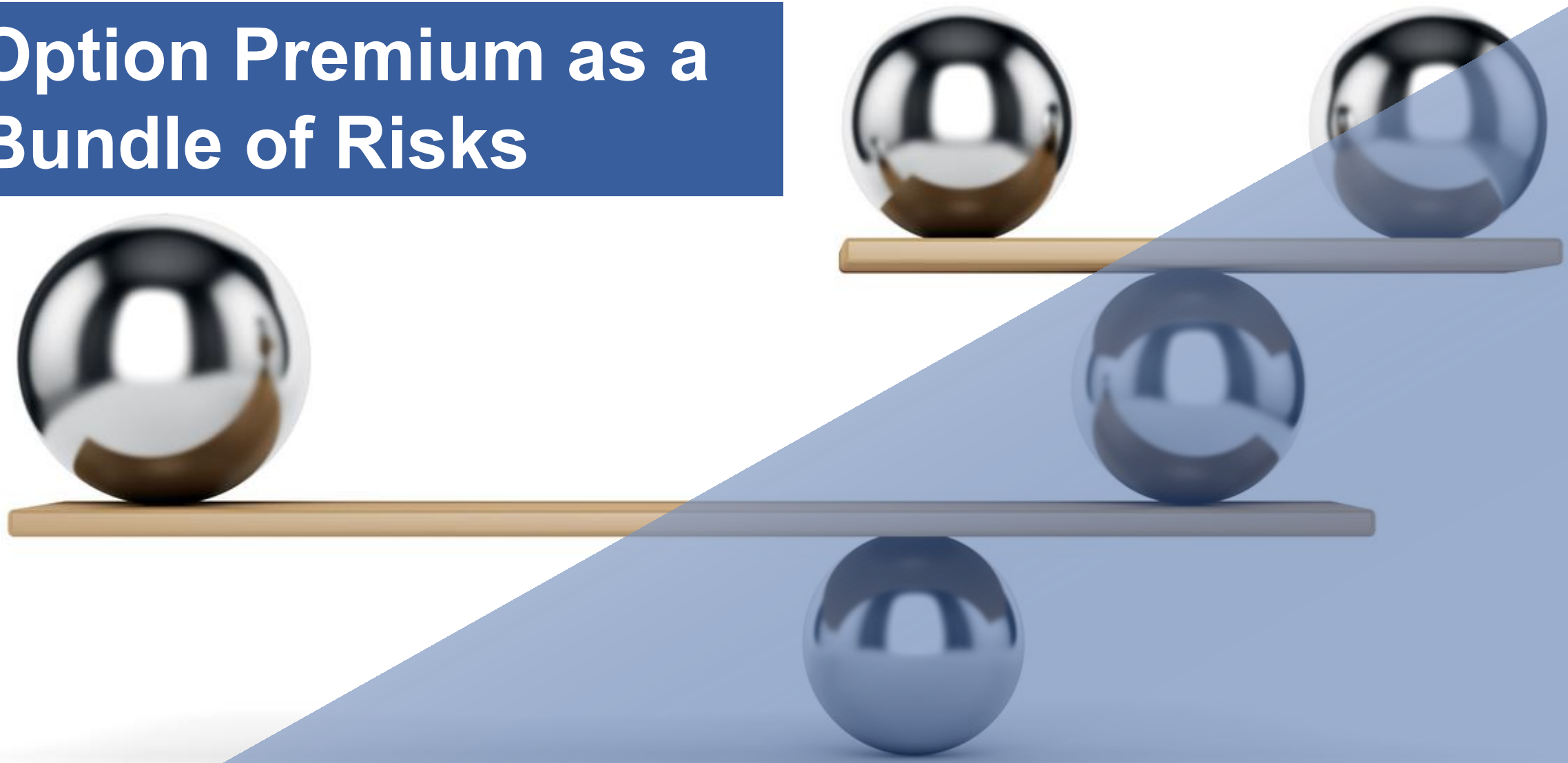
Annual Options Volume 2000-2025



Presentation Outline

- Options Premium as a Bundle of Risks
- Delta and Intrinsic / Extrinsic Value
- Hard and Soft Delta
- Calculating Intrinsic / Extrinsic Value
- Time and Decay
- Implied Volatility and how it shapes Value
- Volatility Regimes
- Q & A

Option Premium as a Bundle of Risks



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The Option Greeks as a Dashboard - A Way to Monitor that Bundle of Risks

Hear:		***Think:***
Delta	→	*Speed*
Gamma	→	*Acceleration*
Theta	→	*Decay*

Consider option Greeks to be like the dashboard of a car. They can help you to monitor risk holistically. You don't need to open the hood of your car to see if it is running. **Option Greeks give you that same ability with your option positions.**

Delta as the Bridge to Intrinsic and Extrinsic Value

Option Delta – A Technical Definition

Delta: An Option's value 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)

Delta Explained Through Metaphor

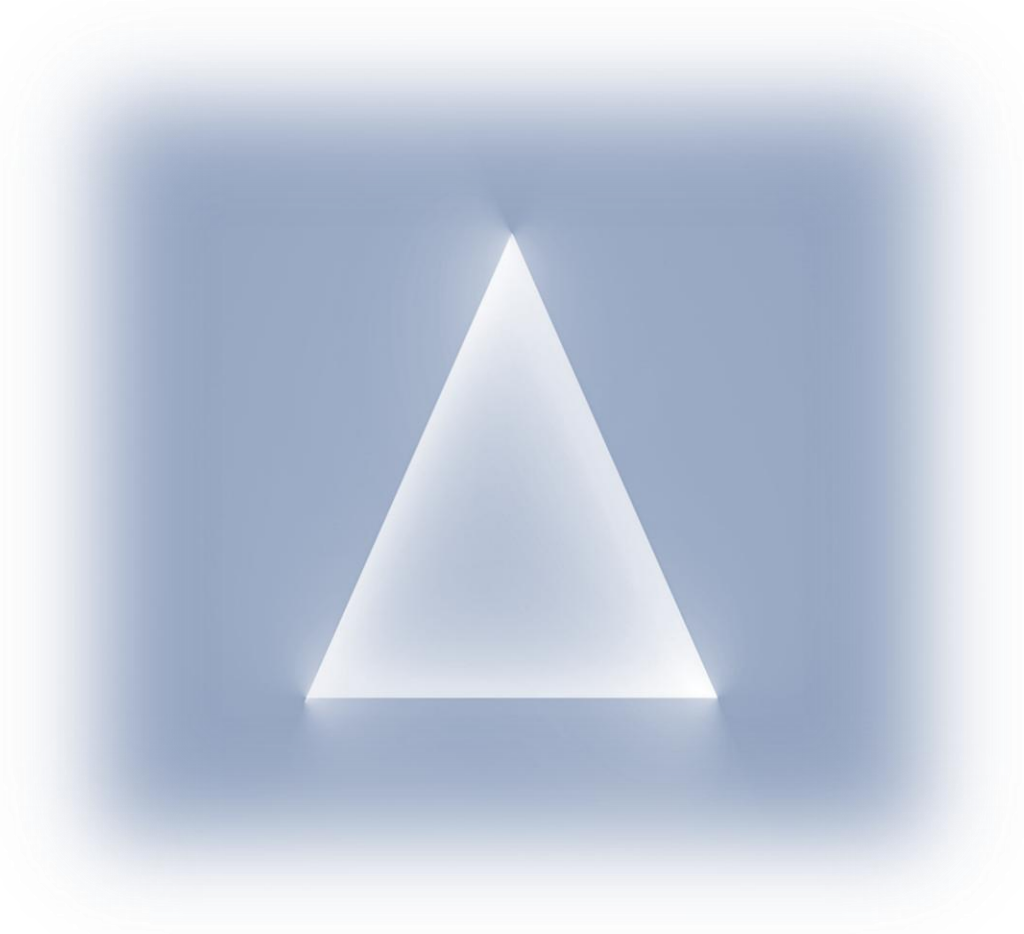
Imagine Delta like a speedometer for an options portfolio.

Just like a car's speedometer tells you how fast you're going, Delta can tell you how much an option's price should theoretically change for every one-point move in the underlying.

Hard and Soft Delta and How it Relates to Intrinsic and Extrinsic Value

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.



You can think of ‘Hard’ Delta as more correlated to an option’s Intrinsic value.

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.

You can think of ‘Soft’ Delta as more correlated to an option’s Extrinsic value.

Calculating Intrinsic and Extrinsic Value

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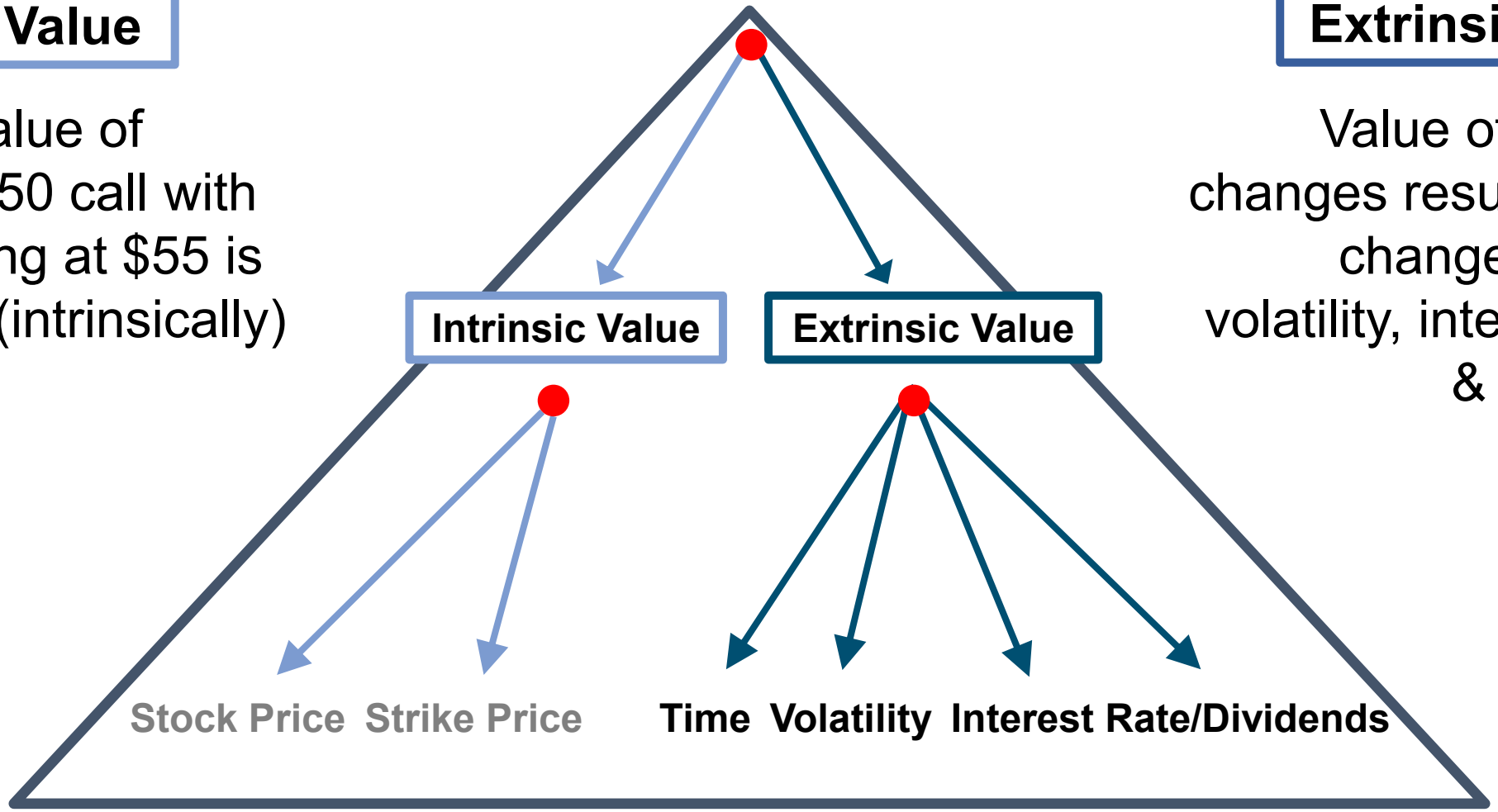
Intrinsic Value vs. Extrinsic Value

Intrinsic Value

Inherent value of option: A $50 call with stock trading at $55 is inherently (intrinsically) worth $5



Extrinsic Value

Value of potential changes resulting from changes in time, volatility, interest rates & dividends

Calculating Intrinsic and Extrinsic Value

Underlying trading: $55.00

Calls	Strike	Puts
$ 6.50	50.00	$ 1.50

In this case, with the calls being in-the-money, they have some amount of **intrinsic value** and some amount of **extrinsic value** - but how much of each?

For an in-the-money option, If you subtract the difference between the strike price and the underlying price (which represents **the intrinsic value**), what is left over is the **extrinsic value**.

($ 6.50 - $ 5.00) = $1.50 of extrinsic value in the call; the rest is intrinsic.

It is not a coincidence that the out-of-the-money put is also worth **$1.50,** even though all of the put's value is **extrinsic.** Put-Call parity relationships keep those values - the **extrinsic value** in both the out-of-the-money options and the in-the-money options aligned.

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Calculating Intrinsic and Extrinsic Value

Underlying trading: $45.00

Calls	Strike	Puts
$ 0.85	50.00	$ 5.85

In this case, with the puts being in-the-money, they have some amount of **intrinsic value** and some amount of **extrinsic value** - but how much of each?

For an in-the-money option, If you subtract the difference between the strike price and the underlying price (which represents **the intrinsic value**), what is left over is the **extrinsic value**.

($ 5.85 - $ 5.00) = $0.85 of Extrinsic Value in the Put - the rest is Intrinsic

It is not a coincidence that the out-of-the-money call is also worth **$0.85,** even though all of the call's value is **extrinsic.** Put-Call parity relationships keep those values - the **extrinsic value** in both the out-of-the-money options and the in-the-money options aligned.

Time and Extrinsic Value Decay

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Option Theta (Time Decay) – A Definition

Theta: An option's value sensitivity to time

Expected time decay in option value

- With the passage of 1 day
- Expressed in decimal form (-.080)
- Decay is per **calendar day**, not per trading day
- Represents cash amount per option
- All other pricing factors constant

Calls and puts both have negative Theta amounts

Theta Explained Through Metaphor

Theta is the theoretical decay of an option's value over the course of one day.

Consider Theta like the sand in an hourglass, constantly moving from one side of the hourglass to the other.

As time passes, and at any given moment, there is less sand in the upper part of the hourglass, and more sand in the bottom part of the hourglass. You can think of this like options decay.

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Implied Volatility as part of Extrinsic Value

Implied Volatility (IV): Definition

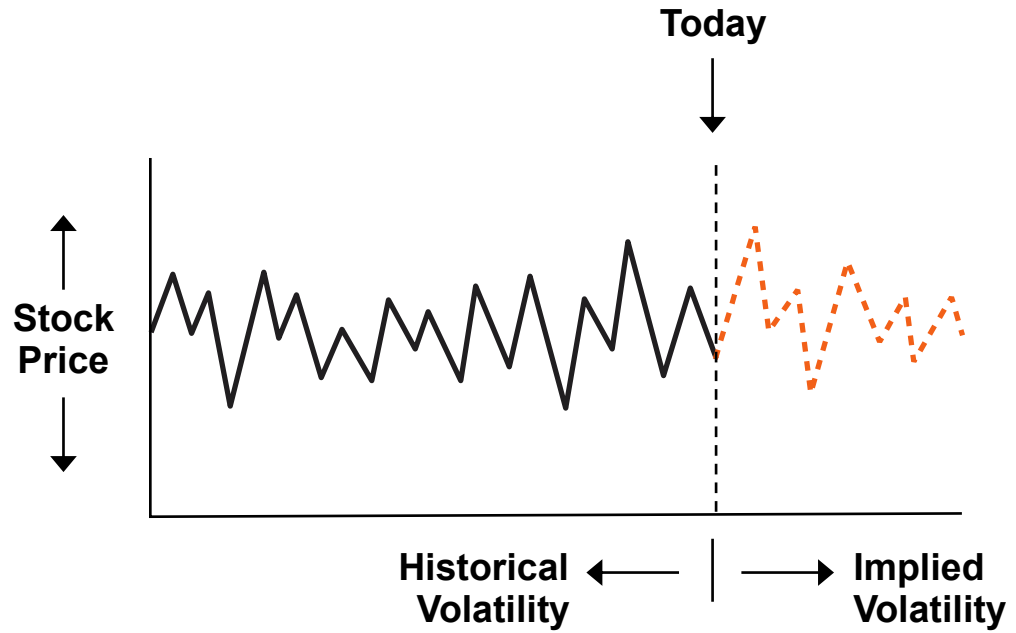
Option implied volatility

- volatility assumption at which option is currently priced in market
- can be determined via option pricing model
- volatility input resulting in value same as current market price
- reflects underlying stock's volatility expected by marketplace
- consensus of all market participants

Who ultimately determines option market prices?

- everybody who makes a bid/ask price and trades an option
- professionals and individual investors alike

Implied Volatility Represents the Future



Option implied volatility reflects current expectations of **future underlying volatility** (forward looking)

Greeks as Risk Signals

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 Explained Through Metaphor

Think of Gamma as the potential change in an option's Delta.

Gamma measures how quickly the Delta of an option can change.

When Gamma is high, an option's Delta can accelerate or decelerate quickly in response to changes in the stock price.

Volatility Regimes: What the Market is Charging for Uncertainty

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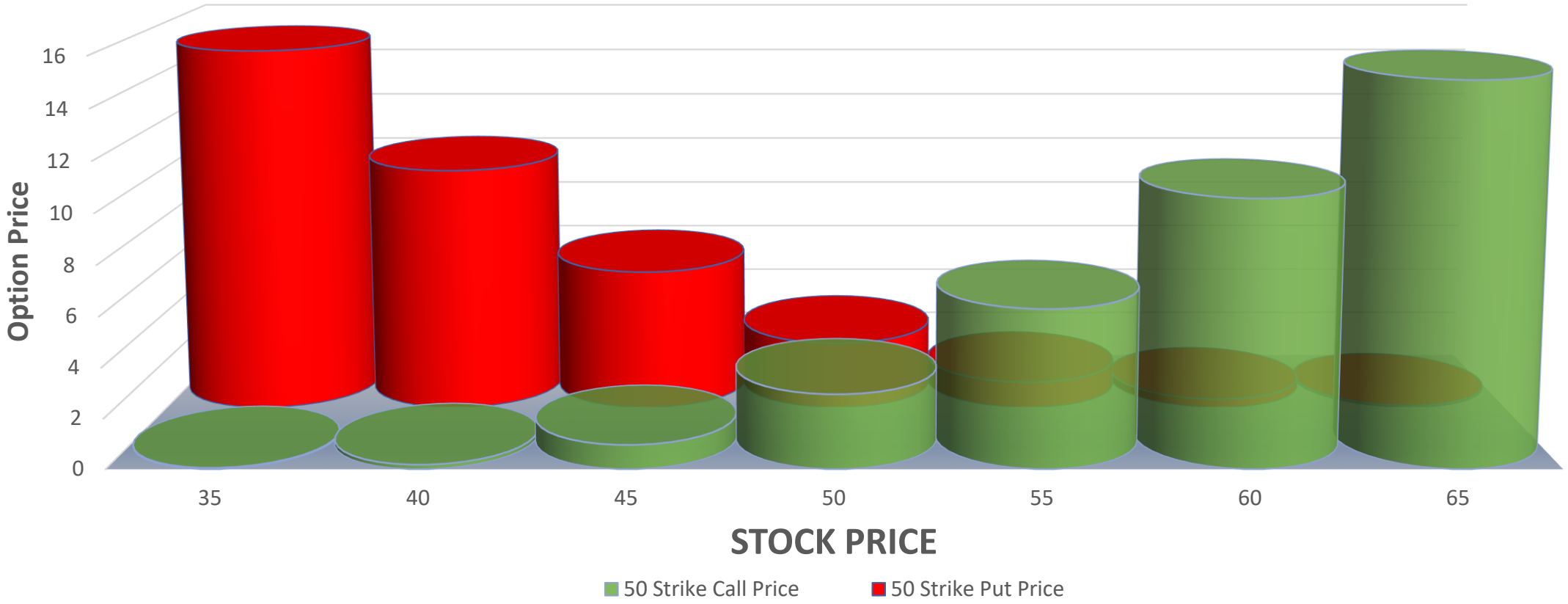
At-the-Money Put and Call Together (The Straddle Components)



Key Takeaways

- **Options premium is a bundle of risks**, not a single bet on direction. Price reflects exposure to movement, time, and uncertainty.
- **Delta bridges intrinsic and extrinsic value.** As Delta becomes "harder," option prices behave more like the underlying; as Delta stays "soft," extrinsic forces dominate.
- **Extrinsic value is shaped primarily by time and volatility.** Theta steadily erodes value, while implied volatility expands or contracts it based on market expectations.
- **Options can move differently than the stock because assumptions change.** Even without price movement, time decay or shifts in implied volatility can materially affect premium.
- **Volatility regimes reflect what the market is charging for uncertainty.** The price of the at-the-money straddle provides a clear window into how expensive or cheap uncertainty is at a given moment.

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