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How Volatility Influences your Option Value

What is Volatility?

- Statistical measure of price fluctuations
- Used to quantify the level of risk or uncertainty

How is Volatility Measured?

- Annualized standard deviation of the underlying daily value changes
- High volatility
  - Fluctuations in a wide range
- Low volatility
  - Fluctuations in a narrow range

Interpreting Volatility

- XYZ is trading at $50.00 and has a volatility of 35%
  - One standard deviation = range +/- $17.50
- XYZ is trading at $50.00 and has a volatility of 20%
  - One standard deviation = range +/- $10.00

Historical Volatility

- Measure of past movements of an underlying asset over a specific period of time

- Standard deviation of an underlying price distribution

Implied Volatility

- Measure of market expectations of future movements in an underlying asset

- Each option contract has a unique implied volatility, which can be influenced by the demand for a specific expiration month or strike price

Implied Volatility

- Implied volatility takes into account:
  - Upcoming earnings announcements
  - Potential mergers and acquisitions
  - Any pending news or unique events
  - Increased volatility of the broader markets

Historical vs Implied Volatility

- A comparison between historical and implied volatility will help determine if the option price is cheap or expensive.
  - If implied volatility is too low, the option price is said to be undervalued.
  - If implied volatility is too high, the options price is said to be overvalued
- A discrepancy does not necessarily mean that the option is not properly priced.

Option Greeks - Vega

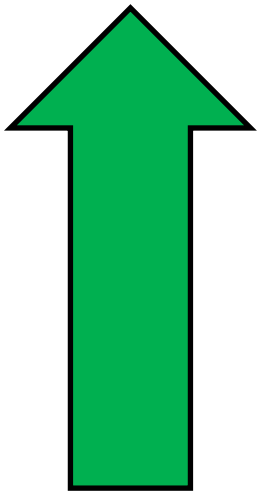
- Measure of change in an option price relative to a percentage change in implied volatility.

High Implied Volatility

- During periods of market uncertainty, the market will fluctuate in a wide range.
- Implied volatility will increase to reflect higher risk and uncertainty.
- Option prices will increase.

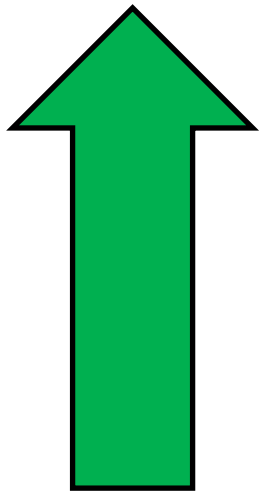
Call & Put Options

Implied Volatility



Option Price

Increase at rate of Vega



Vega Example

Stock Price	$50.00
Strike Price	$50.00
Time	30 days
Option Price	$2.06
Implied Volatility	35%
Vega	0.057

Implied Volatility	↑	36%
Option Price	↑	$2.12

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Low Implied Volatility

- During periods of calm, the market will fluctuate in a narrow range.
- Implied volatility will decrease to reflect lower risk and uncertainty.
- Option prices will decrease.

Call & Put Options

Implied Volatility

Option Price

Decrease at rate of Vega

Vega Example

Stock Price	$50.00
Strike Price	$50.00
Time	30 days
Option Price	$2.06
Implied Volatility	35%
Vega	0.057

Implied Volatility	↓	34%
Option Price	↓	$2.00

The Importance of Vega

- If you are right about direction and wrong about volatility, your trade may not be profitable.

The Importance of Vega

- XYZ is trading at $62.00

- One-month, $70.00-strike call is trading at $2.05.
  - Implied volatility is 70%
  - Delta is 0.304
  - Vega is 0.06

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The Importance of Vega

- Three days later, XYZ is trading at $66.00.
- Implied volatility drops to 40%
- Delta: option gains $1.21 (0.304 X 4)
- Vega: option losses $1.80 (0.06 X 30)
- Net change $0.59 ($1.21 – $1.80)
- Call option price $1.46 ($2.05 - $0.59)

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