

Student Trading Group Options 101

February 8, 2024



Agenda

- Announcements
- Market update
- Open Discussion
- Options 101
- MW Investing Competition
- Q&A

Announcements

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Market Update

- United Parcel Service to cut over 12,000 employees. ▼ -15.61 (-9.91%) past week.
- Cedar Fair Entertainment (NYSE:FUN) to buyout/merge with Six Flags Corporation (NYSE:SIX).
- PYPL beats expected earnings and revenue, shares fall ~7%
- S&P 500 touched 5000\$ but failed to close above
- Disney shares rocket due to partnership with Epic Games
- Pepsico earning Friday morning

Open Discussion

- Recent Trades?
- News?
- Predictions?
- Economic Data?
- Etc.

Derivatives

- A derivative is a class of financial instrument in which its value is derived from an underlying asset.
- A derivative is formed when 2 parties (a buyer and a seller) compose a contract in agreement to take action in the future if certain conditions are met.
- Derivatives come in many forms including options, futures, forwards, and swaps.

Options

- An option is a contract that gives the owner the right, but not obligation, to buy or sell a security at an agreed upon price before an agreed upon future date.
- Each option contract represents 100 shares of the underlying security. This makes options highly leveraged which increases in both potential gains and losses.

Options Terminology

Strike price: Predetermined price in which the security may be purchased (call) or sold (put)

Expiration date: Date in which the contract expires

- DTE: Days to expiration (number of days left before expiration date)

Premium: Cost to buy an option contract

Will be shown as a **per share** cost

i.e. a premium of \$1.00 will cost \$100 for a single contract

Options Terminology

In the Money (ITM)/ Out of the Money (OTM):

- **ITM:** Stock price is currently above (call) or below (put) the strike price
- **OTM:** Stock price is currently below (call) or above (put) the strike price

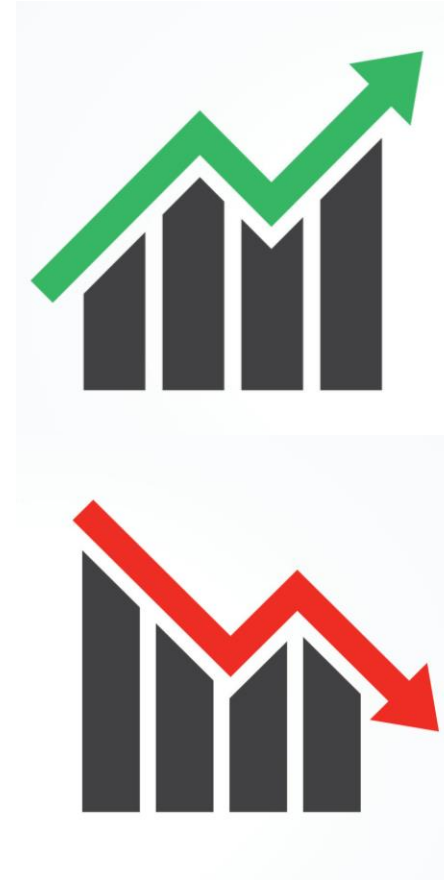
Implied Volatility (IV): A mathematical metric used to capture the market's view on the likelihood of movements in a securities price

Returns: Percentage change in investment value

$$\frac{\text{Ending Value} - \text{Beginning Value}}{\text{Beginning Value}} \times 100$$

Calls Vs. Puts

- **Call** options
 - Give holders the right to buy a security
 - Profit as security price rises
 - Bullish
- **Put** options
 - Give holders the right to sell a security
 - Profit as security price
 - Bearish



Call Option Example

An example of a **call** would be if the writer(seller) of a contract and the buyer of a contract agree to exchange 100 shares of a stock for \$100 per share, as long as the share price is **above** \$100 by the expiration date of February 25th.

If the stock closes at \$105 on Feb. 25th, the buyer will profit \$500 minus the cost of the option.

- $(105 - 100) * 100 = 500$

Call Option Problem

A trader buys 20, 14DTE Calls on TSLA with a strike price of \$183 for a premium of \$2.00 per share.

If TSLA closes at \$186.5 on the expiration date, what will the traders profit be?

Total cost = $20 * (\$2.00 * 100) = \4000

Total revenue = $(\$186.5 - \$183) * 100 * 20 = \$7000$

Profit = revenue - cost = $\$7000 - \$4000 = \$3000$

Put Option Example

- An example of a **put** would be if the writer(seller) of a contract and the buyer of a contract agree to exchange 100 shares of a stock for \$100 per share, as long as the share price is **below** \$100 by the expiration date of February 25th.
- If the stock closes at \$95 on Feb. 25th, the buyer will profit \$500 minus the cost of the option.
- $(100 - 95) * 100 = 500$

Put Option Problem

A trader buys 5, 21DTE Puts on SPY with a strike price of \$496 for a premium of \$2.75 per share.

If SPY closes at \$491 on the expiration date, what will the traders profit be?

Total cost = $5 * (\$2.75 * 100) = \1375

Total revenue = $(\$496 - \$491) * 100 * 5 = \$2500$

Profit = revenue - cost = $\$2500 - \$1375 = \textbf{\$1125}$

Extra Option Problem

A trader buys 7, 21DTE Puts on SPY with a strike price of \$496 for a premium of \$3.25 per share.

If SPY closes at \$499 on the expiration date, what will the traders profit be?

Total cost = $7 * (\$3.25 * 100) = \2275

This contract **did not** expire in the money, it expires worthless

Total profit = **\$-2275**

Black-Scholes Model

Call option:

$$C(S, t) = SN(d_1) - Xe^{-r(T-t)}N(d_2)$$

Put option:

$$P(S, t) = Xe^{-r(T-t)}N(-d_2) - SN(-d_1)$$

where

$$d_1 = \frac{\ln\left(\frac{S}{X}\right) + \left(r + \frac{\sigma^2}{2}\right)(T-t)}{\sigma\sqrt{T-t}}$$

$$d_2 = \frac{\ln\left(\frac{S}{X}\right) + \left(r - \frac{\sigma^2}{2}\right)(T-t)}{\sigma\sqrt{T-t}}$$

S : Current stock price

N : Cumulative standard normal density function

X : Exercise or strike price

r : the risk-free interest rate (annualized)

t : Current time

T : Expiration time

σ : the annualized standard deviations of log return

Greeks

Delta

- Change in an option's price resulting from a change in the underlying
- Higher delta \Rightarrow High risk

Theta

- Measures the rate of time decay in an options value
- How much the value of an option will decrease each day due to the depreciating nature of options

Gamma

- Rate of change in delta over time.
- Does not change with the movement of the underlying asset

Vega

- Risk of changes in implied volatility or the forward-looking expected volatility of the underlying
- How much an option price will increase or decrease given an increase or decrease in the level of implied volatility

Careers that utilize derivatives

- Sales & Trading – The “market makers” for big investors.
- Hedge Funds – A group of people that pool funds to invest and make a return greater than the S&P 500.
- Quant Firms – A group of people who invest with company funds to make a return greater than the S&P 500.
- Prop Shops – A company giving funds to certified traders.

How do Institutional Traders vs. Retail Traders Utilize options?

Institutional Traders:

- **Sophisticated Strategies:** Institutional traders often employ more complex options strategies due to their expertise and access to resources. These strategies may involve combinations of calls, puts, spreads, and other derivatives.
- **Risk Management:** Institutions use options to hedge their portfolios against adverse price movements. Examples of such could be protective puts or collars.
- **Income Generation:** Institutions can sell covered calls on stocks they hold to generate additional income.

Retail Traders:

- **Leverage:** Options allow retail traders to control a larger position with less capital. By paying a smaller premium, they can gain exposure to the asset's price movement.
- **Earnings play:** Retail traders may buy call options or put options (vice versa) ahead of earnings announcements or annual general meetings, hoping to profit from significant price swings or increased shareholder momentum.
- **Protective Puts:** Retail Traders can also use put options to protect their portfolios during market downturns or bearish markets.

Don't feel discouraged

Understanding options in the stock market can take a while to fully understand and grasp.

Don't expect to know everything all in one day.

It takes a lot of studying and practice with options to get a solid foundational understanding on what options are and especially on how to use options to your benefit.

Student Trading Group Website

msustg.org

MarketWatch Investing Competition

- <https://www.marketwatch.com/games/msu-stg-ss24>
- ID: MSU STG SS24
- Password: msustg

Q & A