Stocks & Options

STG FW24 Week 2

Agenda

- Market Update
- Open Discussion
- Announcements
- Stocks
- Options
- Q&A

Market Update

- CPI (MoM) 0.3% Forecast -> 0.2%
- CPI (YoY) 2.5% Forecast -> 2.5%
- FOMC interest rate decision 50bps cut
- Existing Home sales (Aug) 3.86M Forecast -> 3.92M
- Retail Sales 0.1% Forecast -> -0.2%
- Initial Jobless Claims 219K <- Forecast 230K

- S&P 500 5,717 +98.8
- NASDAQ 18,026 +452.8
- DOW Jones 42,014 +510.92
- Crude Oil 71 +1.13
- Gold 2,611 +13.3
- 10-Year Yield 3.73%
- BTC 63,475.2 +1,761.11

Open Discussion

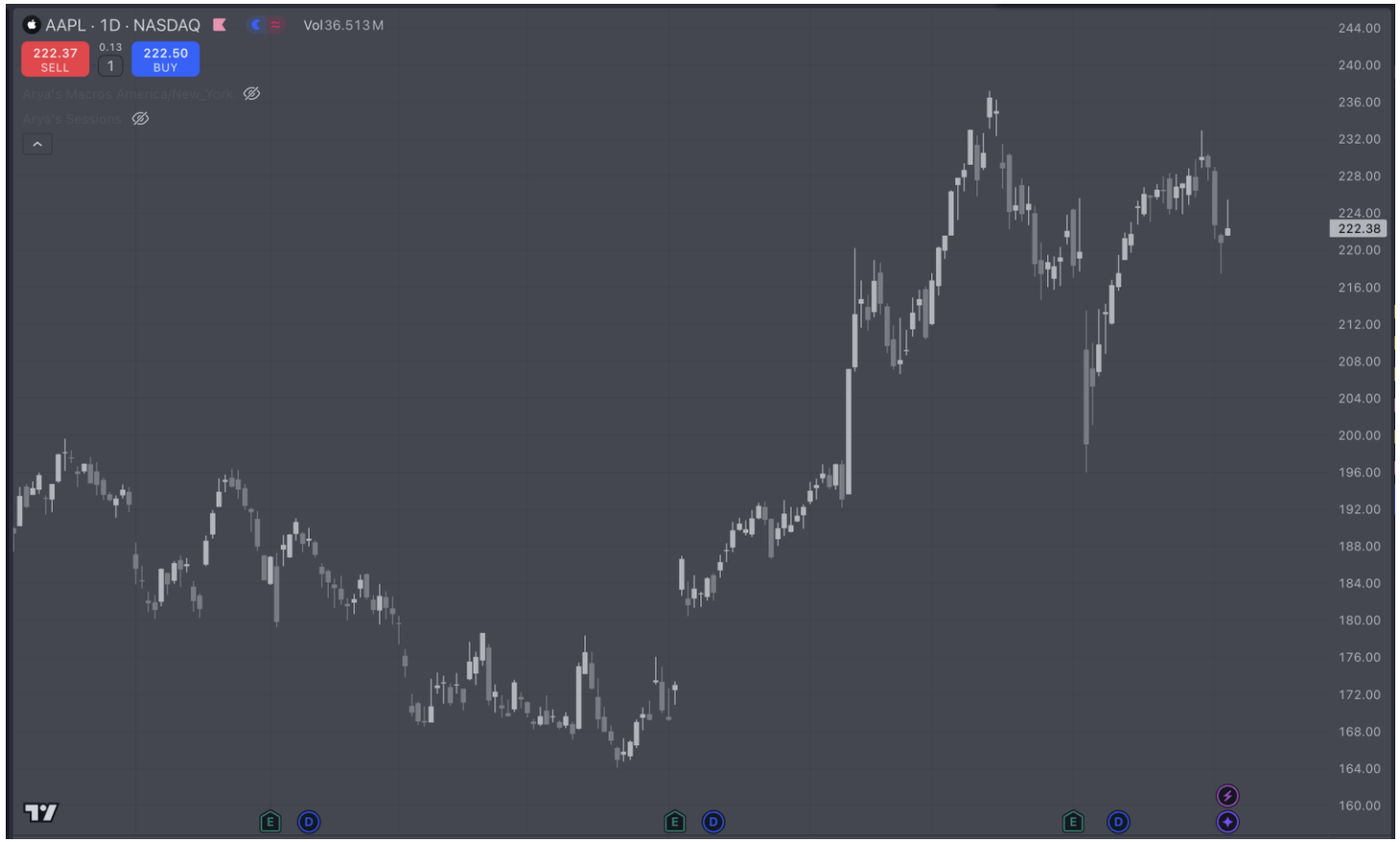
- Recent Trades?
- News?
- Predictions?
- Economic Data?
- Earnings?
- Etc.

Announcements

- Trade Pitch applications pushed back 1 week (9/26 at midnight), interviews the following week
  - An email with initial questions and interview time requests will be sent after the meeting

- Trading Competition also pushed back to 9/23 (Monday), links will be sent via email

Stocks


AAPL · 1D · NASDAQ
Vol36.513M
222.37
SELL
0.13
1
222.50
BUY
Arya's Macros America/New_York
Arya's Sessions
244.00
240.00
236.00
232.00
228.00
224.00
222.38
220.00
216.00
212.00
208.00
204.00
200.00
196.00
192.00
188.00
184.00
180.00
176.00
172.00
168.00
164.00
160.00

What is a Stock?

One sector of the financial market is the stock market.

A stock represents **share** of ownership in a company and constitutes a claim of part of the company's assets and earnings.

Purchasing shares is like owning a small piece of a company. If the company does well, the shares will be worth more, making you a profit.

Terminology

- Share- Unit of ownership in a company
- Ticker- Abbreviated name (AAPL, SPY)
- Shares Outstanding- Total number of shares for a given company
- Market Cap- Total value companies shares (Share price * shares outstanding)
- Volatility- How much/fast price moves
- 52 Week Range- Lowest to highest share price within the last year
- Ask Price- Lowest price someone is willing to sell at
- Bid Price- Highest price someone is willing to buy at
- Bid-Ask Spread- Difference between bid and ask price
- Volume- Number of shares traded over a period

Sectors

- Technology
- Communication
- Financials
- Healthcare
- Industrials
- Food/Beverage
- Energy
- Real Estate
- Utilities
- Defense
- Materials
- Etc.

Screening

Qualitative Analysis

- Sector
- Products
- Deals
- Cycles
- Leadership

Quantitative Analysis

- PE Ratio
- Price Levels
- Market Cap
- Volume
- Beta (β)

Finviz is a great place for stock screening, can filter based on most quantitative features, and can further filter by some qualitative details to narrow down your search results

Valuation Methodologies

Discounted Cash Flows Analysis

Comparable Companies Analysis

Precedent Transaction Analysis

Stock Example

A trader buys 3 shares of XYZ for $100 and sells them at the end of the day for a 3% gain.

What is the trader's profit?

3 * (100 * .03) = $9 profit

Stock Problem 1

A trader buys 3 shares of XYZ for $100 and sells at $105.

What is the trader's profit?

Difference = 105 - 100 = 5

Total = 3 * 5 = 15

Profit = $15

Stock Problem 2

A trader places a 2-day trade on 1 share of XYZ at an initial price of $50. On the first day the share price drops 3%. On the second day the share price rises 10%.

What is the trader's final profit?

Day 1: shares = 0.97 * 50 = $48.5

Day 2: shares = 1.10 * 48.5 = $53.35

Profit = Final Price – Initial Price

Profit = **$3.35**

Options

Derivatives

A derivative is a class of financial instruments in which its value is derived from the 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.

This meeting we will dive into options.

Options

An option is a contract that gives the owner the **right**, but not the **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 both potential gains and potential losses.

Calls & Puts

Call: An option that provides the buyer with the right, but not the obligation, to **buy** assets at an agreed upon price on or before a particular date

Put: An option that provides the buyer with the right, but not the obligation, to **sell** assets at an agreed upon price on or before a particular date

Option Notation

$S_0 = Current\ Stock\ Price$

$S_t = Stock\ price\ at\ maturity$

$K = Strike\ Price$

$T = Time\ to\ Expiration$

$D = Dividends\ paid\ during\ life\ of\ option$

$r = Risk\ free\ rate\ for\ T$

$\sigma = Volatility\ of\ stock\ price$

Options Terminology

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

Exercised: Action is taken on the trade, if profitable for the buyer

Call- If strike price is lower than market price, shares will be bought at strike price

i.e., K = \$100, S_t = \$105 ∴ Shares are bought at \$100 (\$5 less than S_t)

Put- If strike price is higher than market price, shares will be sold at strike price

i.e., K = \$100, S_t = \$95 ∴ Shares are sold at \$100 (\$5 more than S_t)

In the Money (ITM): Option **can** currently be exercised

Out the Money (OTM): Option **cannot** currently be exercised

Options Terminology

Expiration Date: Date in which the option contract expires

Days to Expiration (DTE): Number of days left before option expires

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 option contract

Implied Volatility (IV): percentage that measures the market's expectations for how much a stock's price will fluctuate in the future

i.e., an IV of 10% means the market predicts an Annualized SD of +/- 10%

Options Terminology

Intrinsic Value: How much the contract is "in the money" (ITM)

Ex: a call with a strike at $100 when the underlying is at $101 has $1 of intrinsic value

Extrinsic Value: Factors like DTE and volatility that contribute to the options premium

Ex: option with higher IV and more DTE has more extrinsic value than option with lower IV/less DTE

Out of the Money: How far an option has to move to gain intrinsic value

Ex: a call with a strike of $100 when the underlying is at $99 is out of the money by $1

Options Chain

Impl Vol	Mid	% Change	Last	Ask	Bid	Strike	Bid	Ask	Last	% Change	Mid	Impl Vol
17 Sep 24 (W) 100						0 D						
18 Sep 24 (W) 100						1 D						
19 Sep 24 (W) 100						2 D						
20 Sep 24 100						3 D						
23 Sep 24 (W) 100					↗ Calls	6 D	Puts ↘					
16.37%	7.35	+25.91%	7.24	7.41	7.29	560	3.07	3.09	3.15	-21.25%	3.08	16.39%
16.17%	6.63	+28.68%	6.55	6.65	6.61	561	3.40	3.42	3.40	-22.20%	3.41	16.18%
15.95%	5.98	+31.79%	5.97	5.99	5.96	562	3.77	3.79	3.78	-22.22%	3.78	15.97%
15.75%	5.32	+34.35%	5.28	5.34	5.31	563	4.17	4.18	4.24	-18.77%	4.18	15.75%
15.52%	4.72	+39.24%	4.79	4.73	4.71	564	4.60	4.62	4.61	-21.20%	4.61	15.51%
SPY: 564.56 +1.72 +0.31%												
15.28%	4.14	+43.60%	4.15	4.15	4.12	565	5.07	5.09	5.06	-20.94%	5.08	15.28%
15.04%	3.58	+48.15%	3.60	3.60	3.57	566	5.59	5.61	5.63	-19.34%	5.60	15.04%
14.79%	3.10	+52.45%	3.11	3.11	3.09	567	6.07	6.19	6.00	-19.57%	6.13	14.77%
14.53%	2.64	+41.85%	2.61	2.65	2.63	568	6.65	6.76	6.60	-16.24%	6.70	14.52%
14.26%	2.20	+65.67%	2.22	2.21	2.20	569	7.27	7.39	7.37	-20.41%	7.33	14.26%

Option Problem #1 (Call)

A trader buys 10, 7DTE calls on SPY with a strike price of $560, for a premium of $2.00 per share.

If SPY closes at $570 at expiration, what is the traders profit?

Option Problem #1 (Call)

A trader buys **10**, 7DTE calls on SPY with a strike price of **$560**, for a premium of **$2.00** per share.

If SPY closes at **$570** at expiration, what is the traders profit?

Total Revenue = (570-560) * 100 * 10 = $10,000

Total Cost = 10(2.00 * 100) = $2,000

Profit = Revenue - Cost

Profit = $10,000 - $2,000 = $8,000

The trader will profit $8,000.

Option Problem #2 (Put)

A trader buys 5, 14DTE puts on SPY with a strike price of $540, for a premium of $3.25 per share.

If SPY closes at $525 at expiration, what is the traders profit?

Option Problem #2 (Put)

A trader buys **5**, 14DTE puts on SPY with a strike price of **$540**, for a premium of **$3.25** per share.

If SPY closes at **$525** at expiration, what is the traders profit?

Total Revenue = (540-525) * 100 * 5 = $7,500

Total Cost = 5(3.25 * 100) = $1,625

Profit = Revenue - Cost

Profit = $7,500 - $1,625 = $5,875

The trader will profit $5,875.

Option Problem #3 (Call)

A trader buys 7, 21DTE calls on SPY with a strike price of $555, for a premium of $1.75 per share.

If SPY closes at $545 at expiration, what is the traders profit?

Option Problem #3 (Call)

A trader buys **7**, 21DTE calls on SPY with a strike price of **$555**, for a premium of **$1.75** per share.

If SPY closes at **$545** at expiration, what is the traders profit?

Since $S_t < K$, This option will not be exercised (no revenue)

Total Cost = 7(1.75 * 100) = $1,225

Profit = Revenue - Cost

Profit = $0 - $1,225 = -$1,225

The trader will profit -$1,225 (lose $1,225).

Greeks

Delta Δ

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

Theta Θ

- 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 Γ

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

Vega ν

- 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

Greeks Formulas

Let V refer to the value of a put or call option,

Delta

$$\Delta = \frac{\partial V}{\partial S}$$

Gamma

$$\Gamma = \frac{\partial^2 V}{\partial S^2}$$

Rho

$$\rho = \frac{\partial V}{\partial r}$$

Theta

$$\Theta = \frac{\partial V}{\partial t}$$

Vega

$$\upsilon = \frac{\partial V}{\partial \sigma}$$

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,

$$d_1 = \frac{\ln\left(\frac{S}{X}\right) + \left(r + \frac{\sigma^2}{2}\right)(T-t)}{\sigma\sqrt{T-t}} \qquad d_2 = \frac{\ln\left(\frac{S}{X}\right) + \left(r - \frac{\sigma^2}{2}\right)(T-t)}{\sigma\sqrt{T-t}}$$

S: Current stock price

N: Cumulative standard normal density function

X: Exercise or strike price

r: Risk-free interest rate (annualized)

t: Current time

T: Expiration time

σ: Annualized standard deviations of log return

Q & A