Financial Risk Assessment

OSEON LEARNING PROJECT 1

BY AMOABENG YEBOAH

AGENDA

- DATA DESCRIPTION
- STATISTICAL SUMMARY
- DATA TREND PATTERNS
- VOLATILITIES
- RELATIONSHIP BETWEEN THE CHANGES IN STOCK PRICES
- CAPITAL ASSET PRICING MODEL
- RISK ASSESSMENT
- MODEL VISUALIZATION

DATA DESCRIPTION

- Source of Data: Extracted live data from Yahoo Finance.
- Time Period: Covers 5 years of stock data from 2018 to 2023.
- Frequency: Daily stock values for detailed trend analysis.
- Companies Analyzed:
  - Microsoft (MSFT)
  - Apple (AAPL)
  - Tesla (TSLA)
- Market Index: S&P 500 values are included as a market benchmark.

DATA DESCRIPTION CON'T

- Percentage Change Variable:
  - Calculated daily percentage change for individual stocks.

  Represented as :
  - MS%chng for Microsoft
  - App%chng for Apple
  - Tesl%chng for Tesla.
- S&P 500 Index:
  - Denoted as SP%chng, used to track the overall market performance.

STATISTICAL SUMMARY

- Tesla shows the highest volatility with the largest standard deviation, followed by MSFT, Apple, and the S&P 500.

- MSFT has the highest average stock price, followed by Tesla and then Apple.

- Based on skewness and kurtosis:
- MSFT and Apple show a more stable price range with fewer extreme values
- While Tesla exhibits more variability and potential for extreme values.

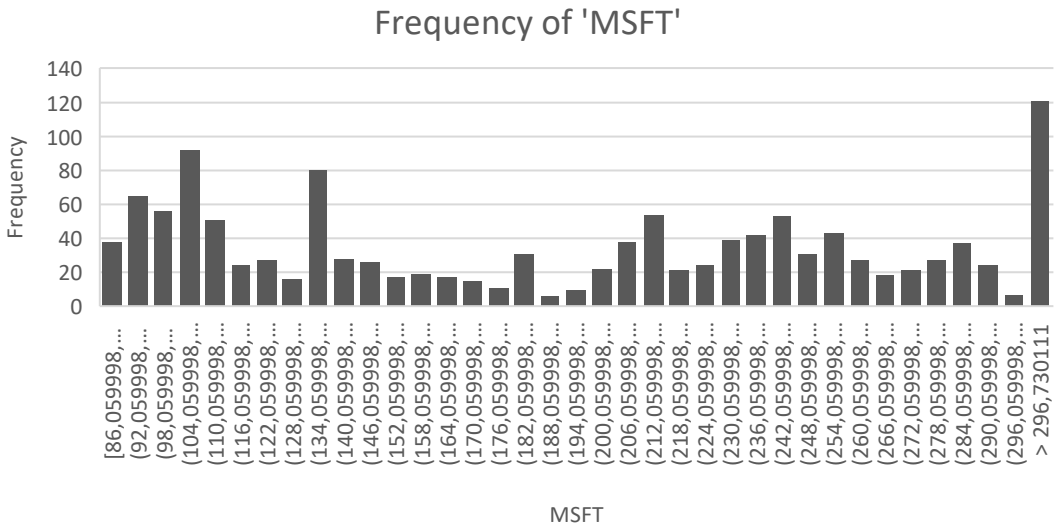
	MSFT	*Tesla*	*Apple*	*SP500*
Mean	194,4708998	131,8952112	98,57410424	3457,034092
Standard Error	2,076481441	3,27746698	1,29167174	18,64546377
Median	203,580002	96,573334	95,0874975	3294,67
Mode	95,139999	24	127,82	2832,41
Standard Deviation	74,23239641	117,1665796	46,17613562	666,5590312
Sample Variance	5510,448676	13728,00737	2132,235501	444300,9421
Kurtosis	-1,287957663	-1,257261138	-1,582037477	-1,297242885
Skewness	0,149832436	0,470592085	0,121834092	0,333240031
Range	258,559997	399,396668	146,635006	2513,8
Minimum	86,059998	12,073333	35,994999	2290,71
Maximum	344,619995	411,470001	182,630005	4804,51
Sum	248533,81	168562,0799	125977,7052	4418089,57
Count	1278	1278	1278	1278

MSFT (Microsoft Corporation)

Positive skewness (0.14) suggests the distribution tails off to the right
There are a number of unusually high values.

Negative kurtosis (-1.28) suggests fewer extreme outliers than a normal distribution.

Platykurtic curve

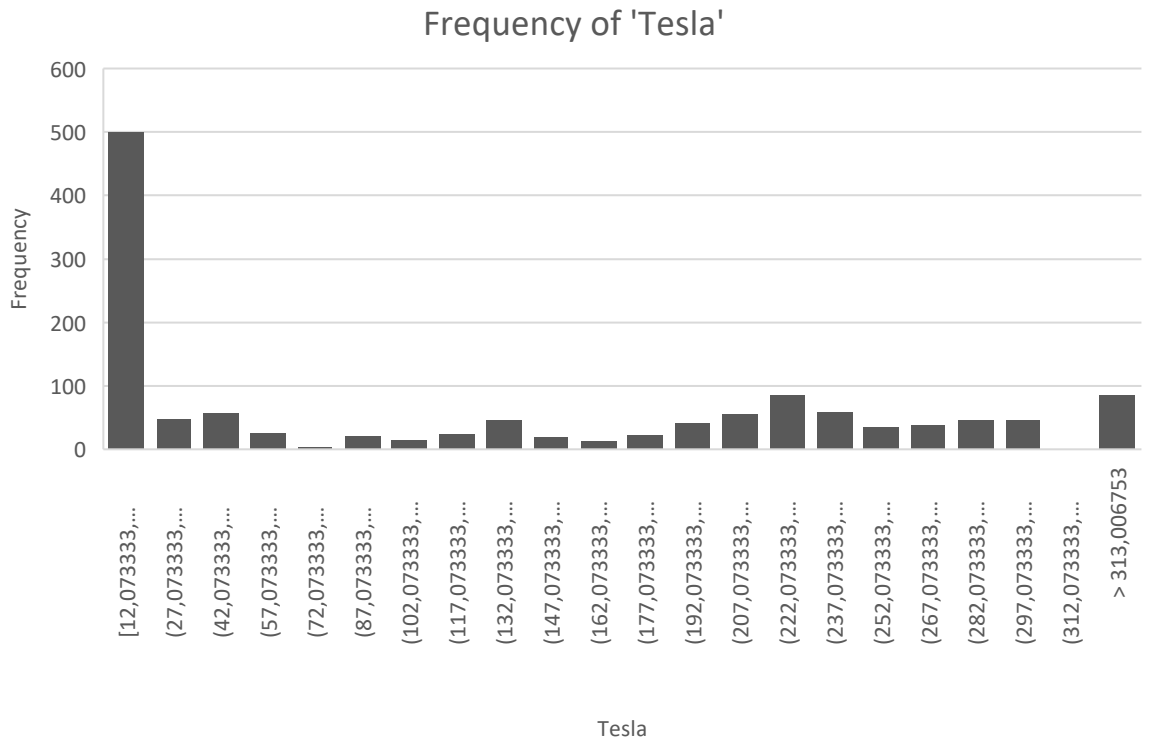


Tesla

Skewness: Positive (0.47) shows a right tail, similar to MSFT but more pronounced.

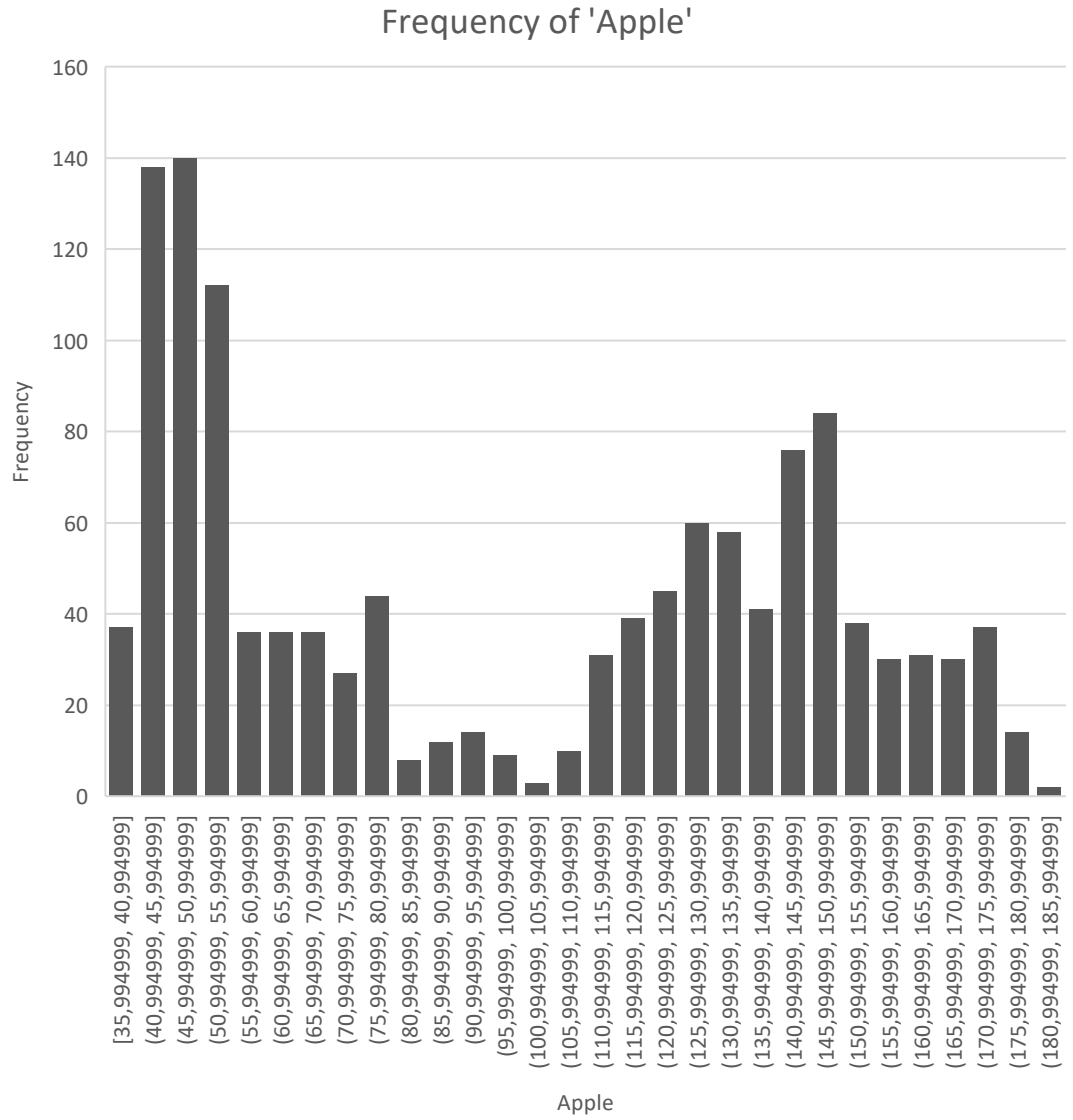
Kurtosis: Negative (-1.25) implies less likelihood of extreme outliers.

Platykurtic curve



Apple

- Skewness: Slightly positive (0.12), showing a gentle right tail.
- Kurtosis: Negative (-1.58), implying a flatter distribution with fewer outliers.
- Platykurtic curve

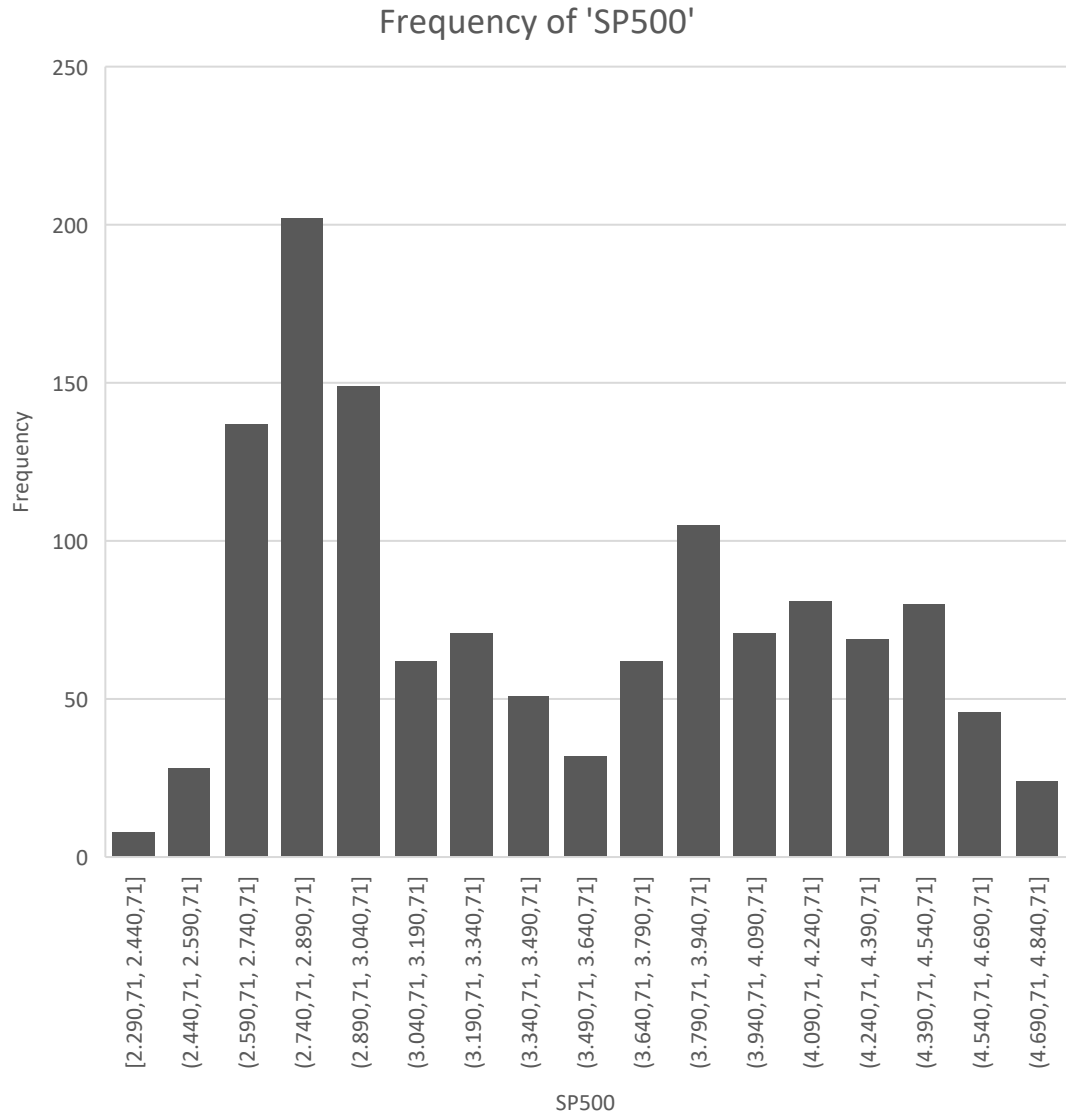


S&P 500 (SP500)

Skewness: Positive (0.33), indicating a longer right tail.

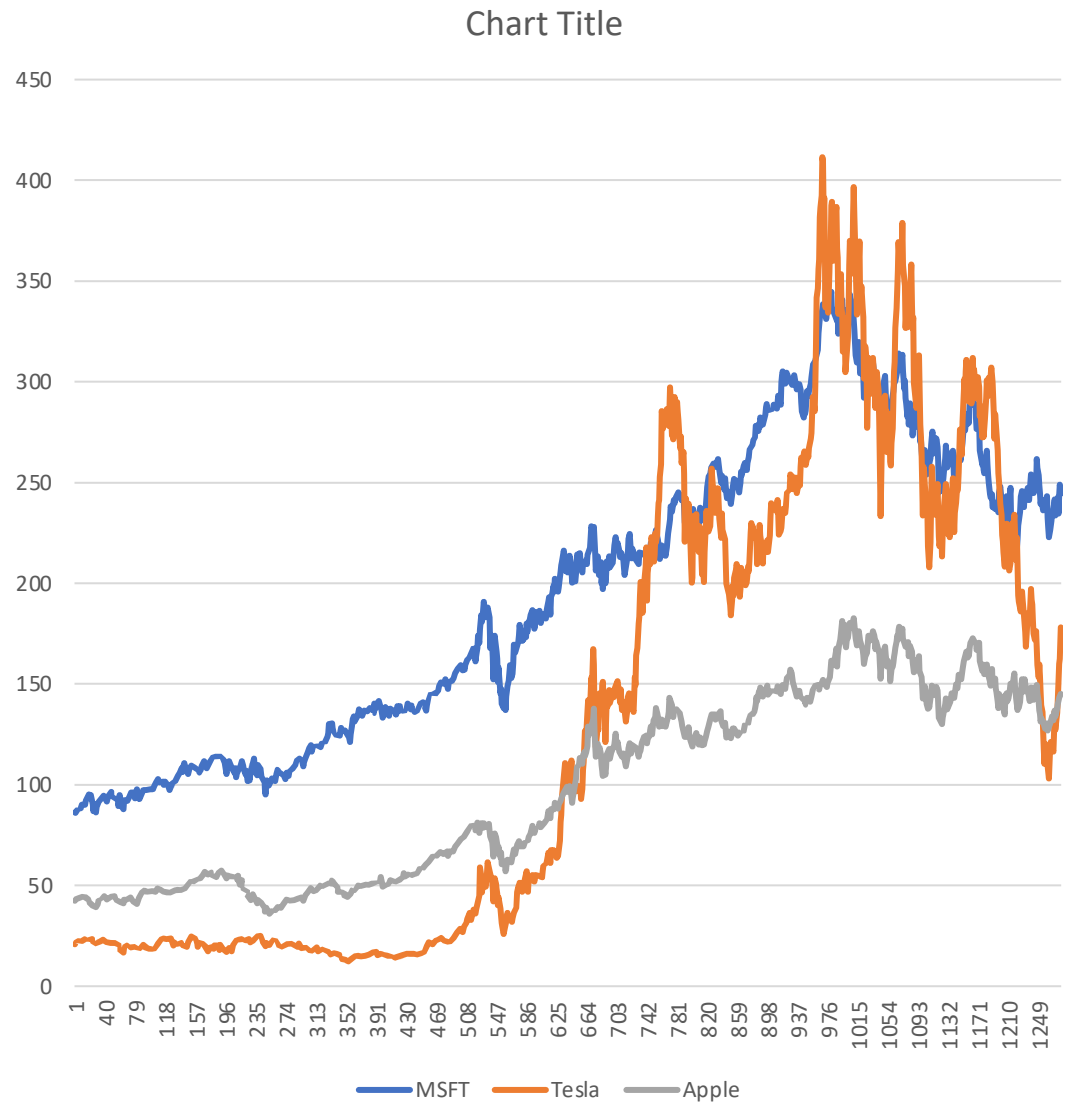
Kurtosis: Negative (-1.29), suggesting the index has a flatter peak compared to the normal distribution.

Platykurtic curve



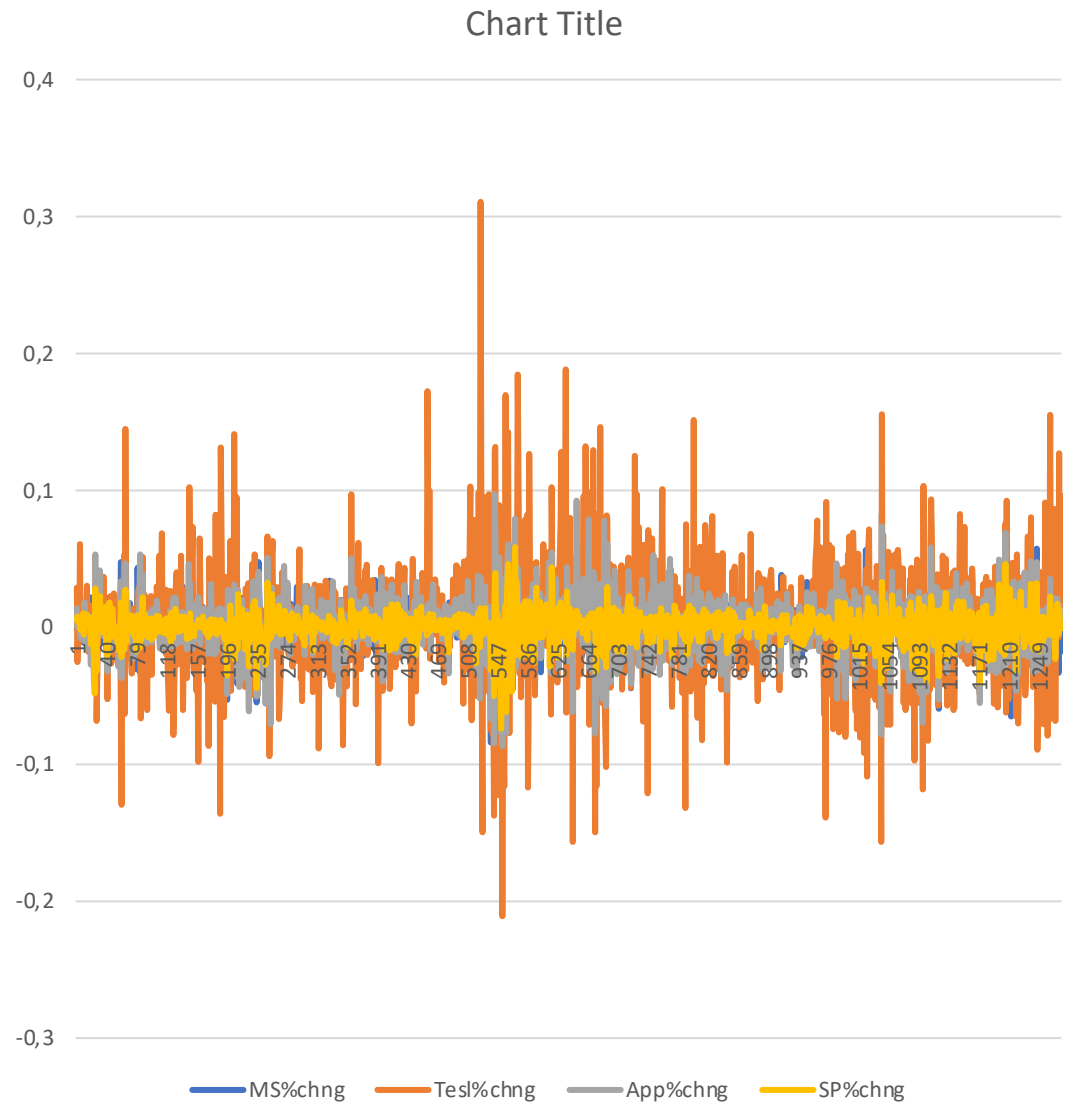
DATA TREND

- Tesla (orange line): Displays significant volatility
- Microsoft (MSFT - blue line) and Apple (gray line): Show growth with less volatility compared to Tesla.



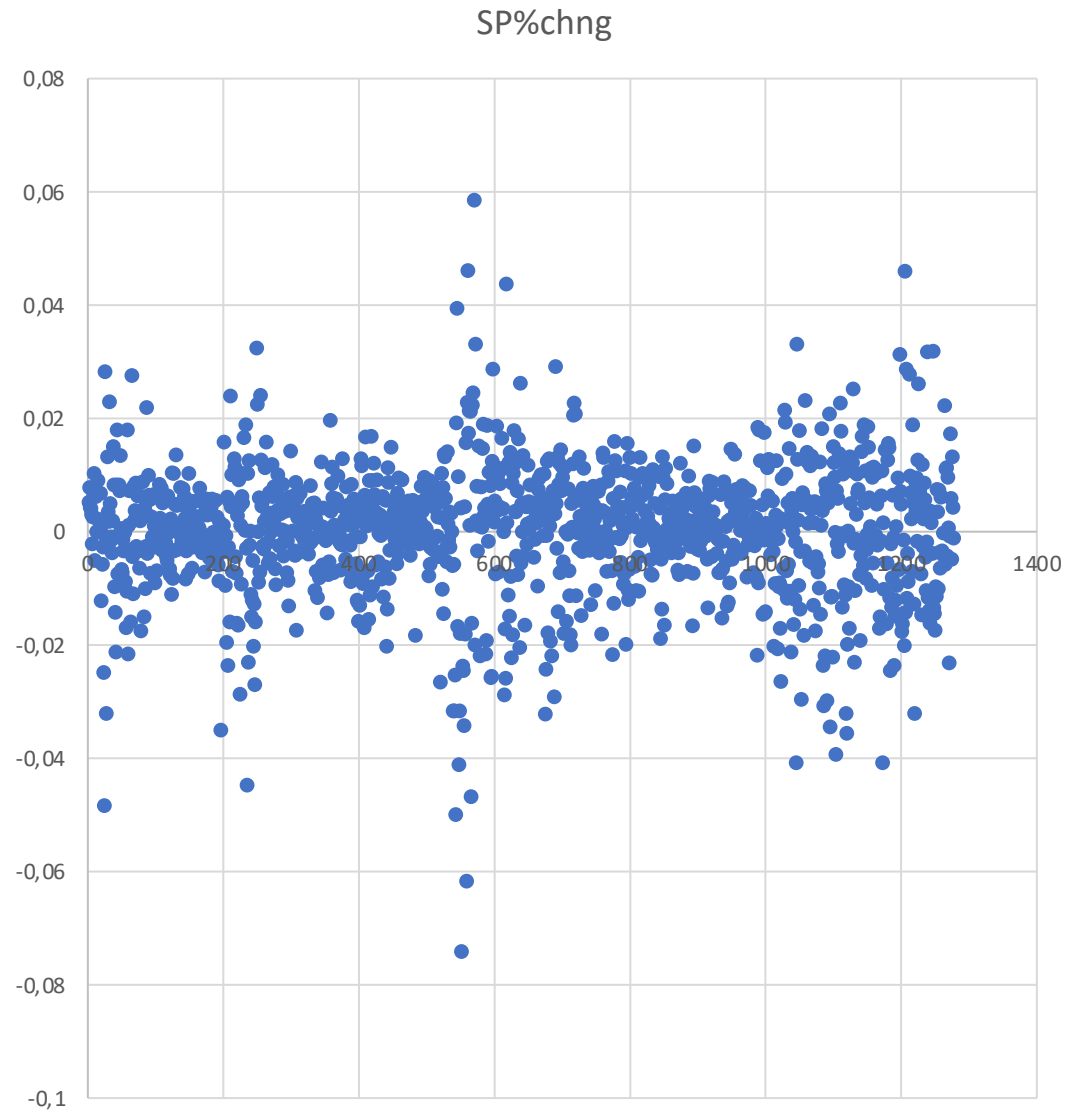
VOLATILITIES

- Tesla's line shows the highest peaks and troughs,
  - indicating that it has the most significant daily percentage changes,
  - reflective of high volatility.



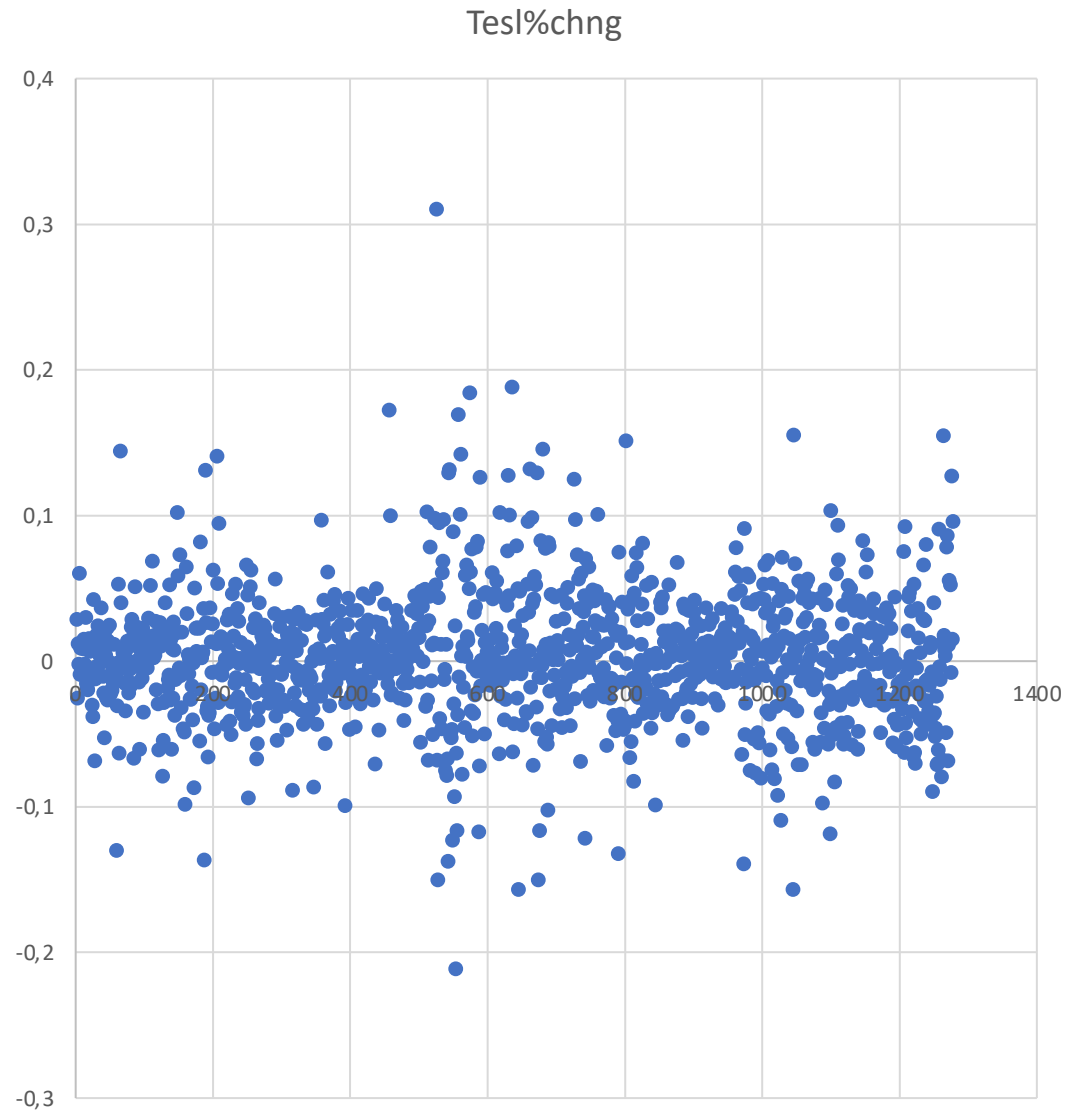
S&P 500 (%chg)

- stationary
- on most days, the percentage change is minimal.
- There are no extreme outliers
- which indicates a stable market index without extreme volatility.



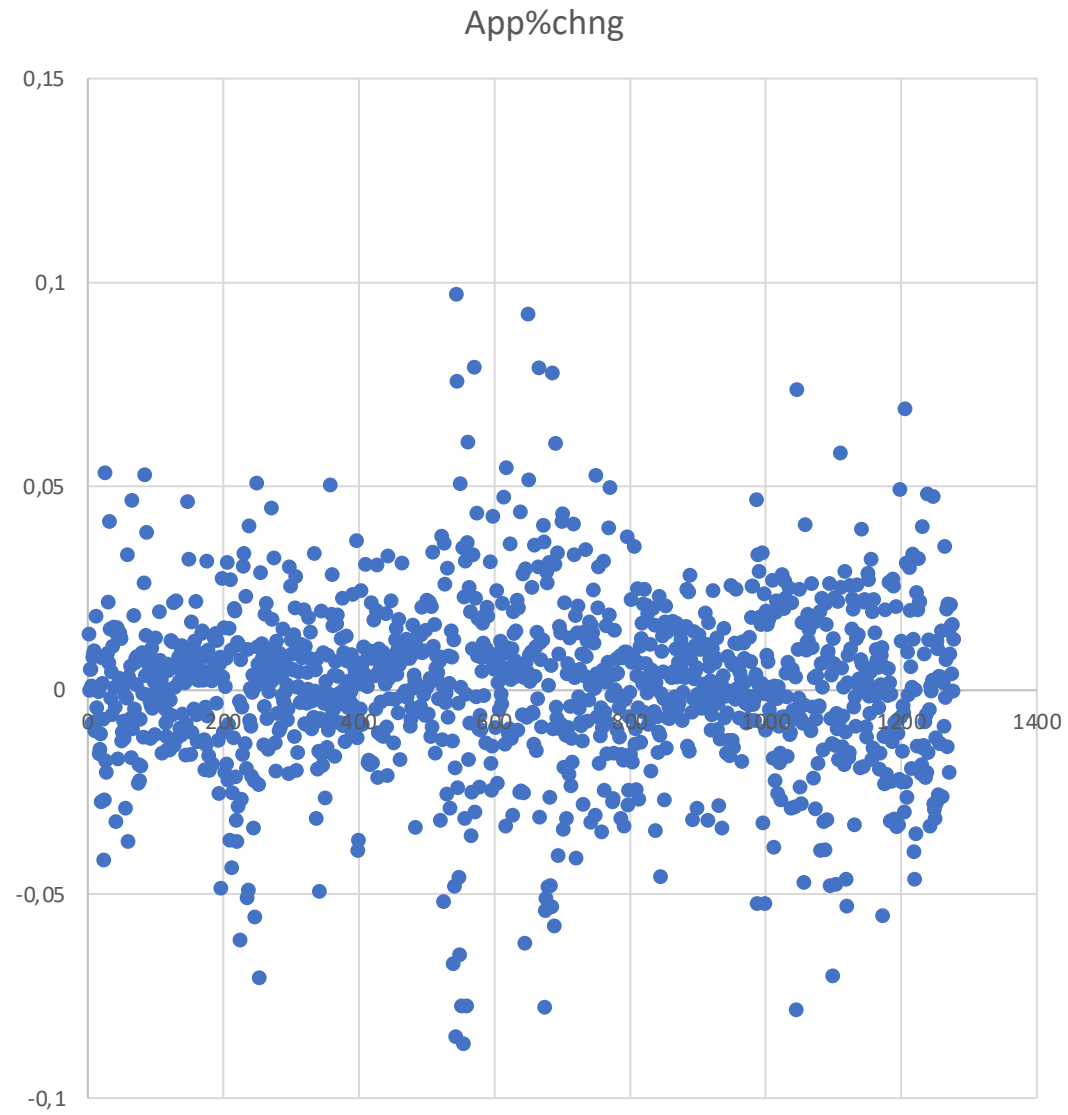
Tesla (%chg)

- stationary
- more spread along the y-axis compared to the S&P 500.
- This indicates that Tesla's daily percentage changes are more volatile
- consistent with the nature of individual stocks as opposed to market indices.



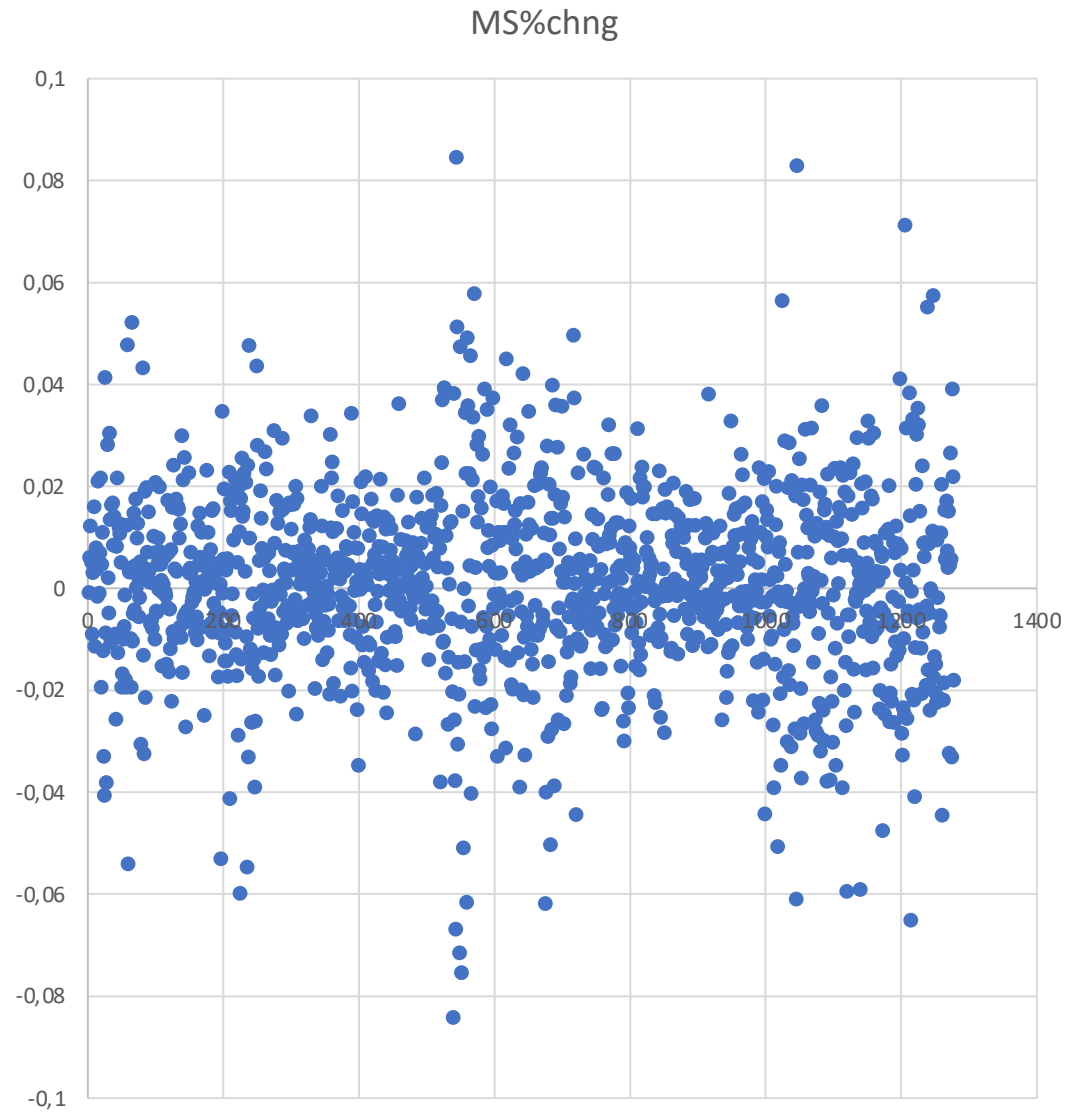
Apple (%chg)

- Similarly, plot points are concentrated around the zero line.
- The spread is slightly more than the S&P 500,
- suggesting mild volatility, but less than Tesla
- indicating a relatively stable performance for a large-cap stock.



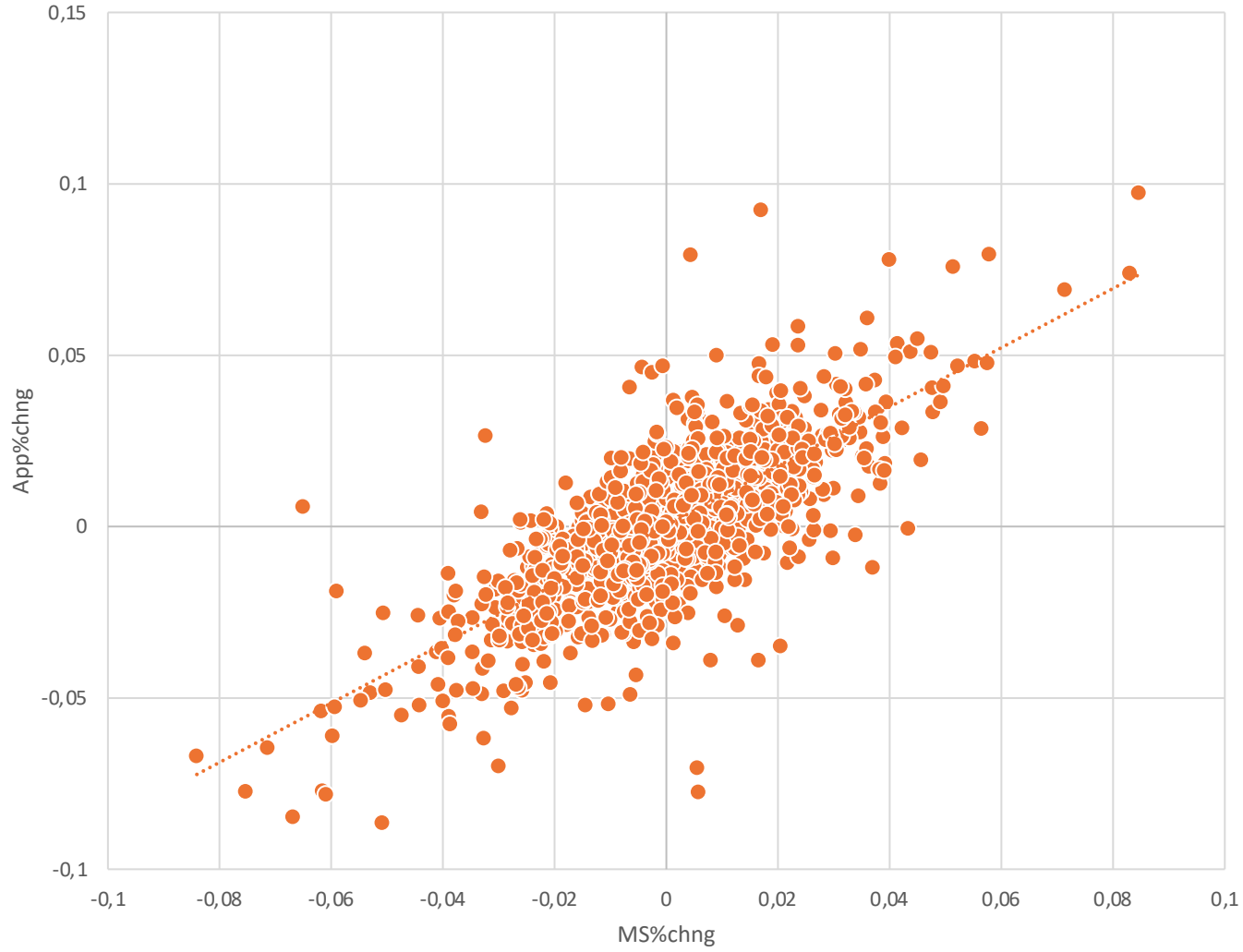
Microsoft (%chg)

- The points for Microsoft show a distribution pattern similar to Apple
- With most of the data clustered close to the zero line.
- It indicates stability
- But with some days of notable percentage changes.



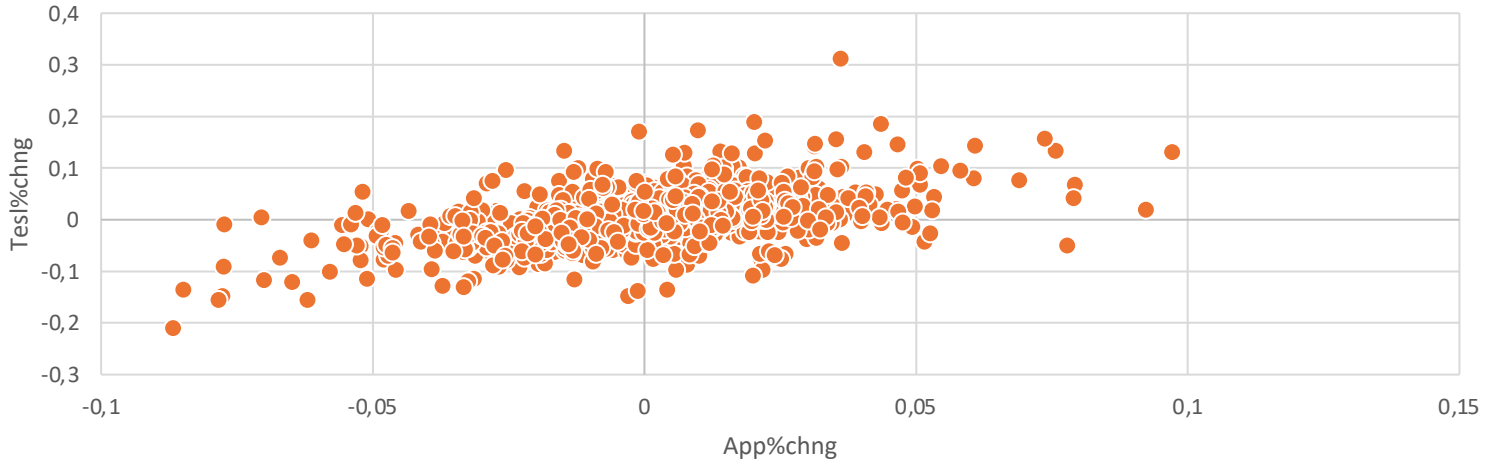
RELATIONSHIP BETWEEN THE CHANGES IN STOCK PRICES

Field: MS%chng and Field: App%chng appear highly correlated.

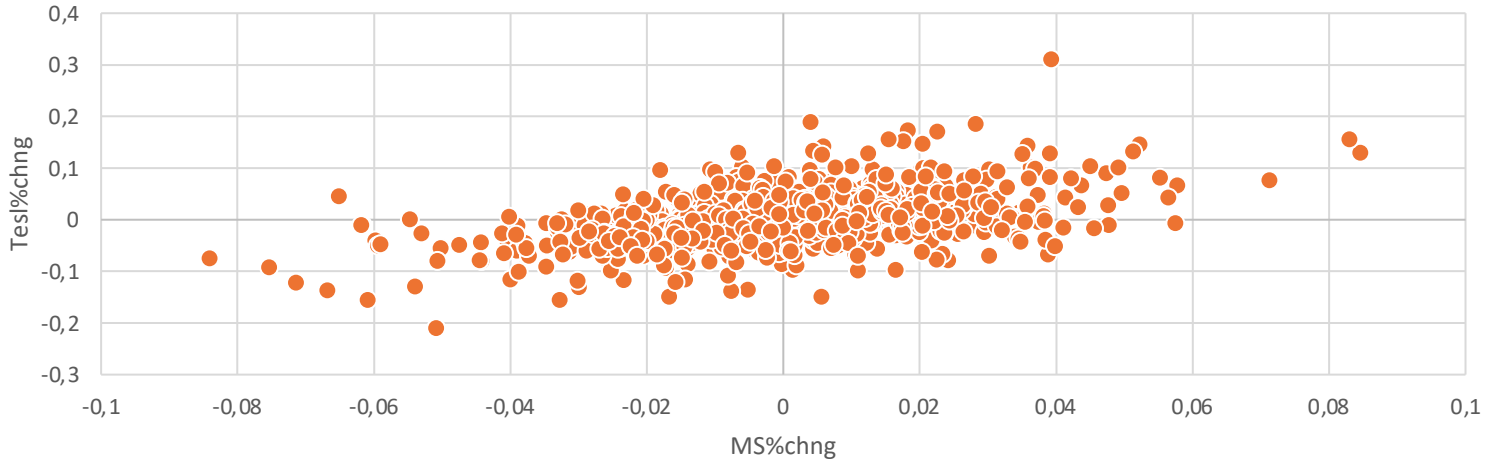


RELATIONSHIP BETWEEN THE CHANGES IN STOCK PRICES

Field: Tesl%chng appears highly determined by Field: App%chng.



Field: MS%chng and Field: Tesl%chng appear highly dependent on each other.



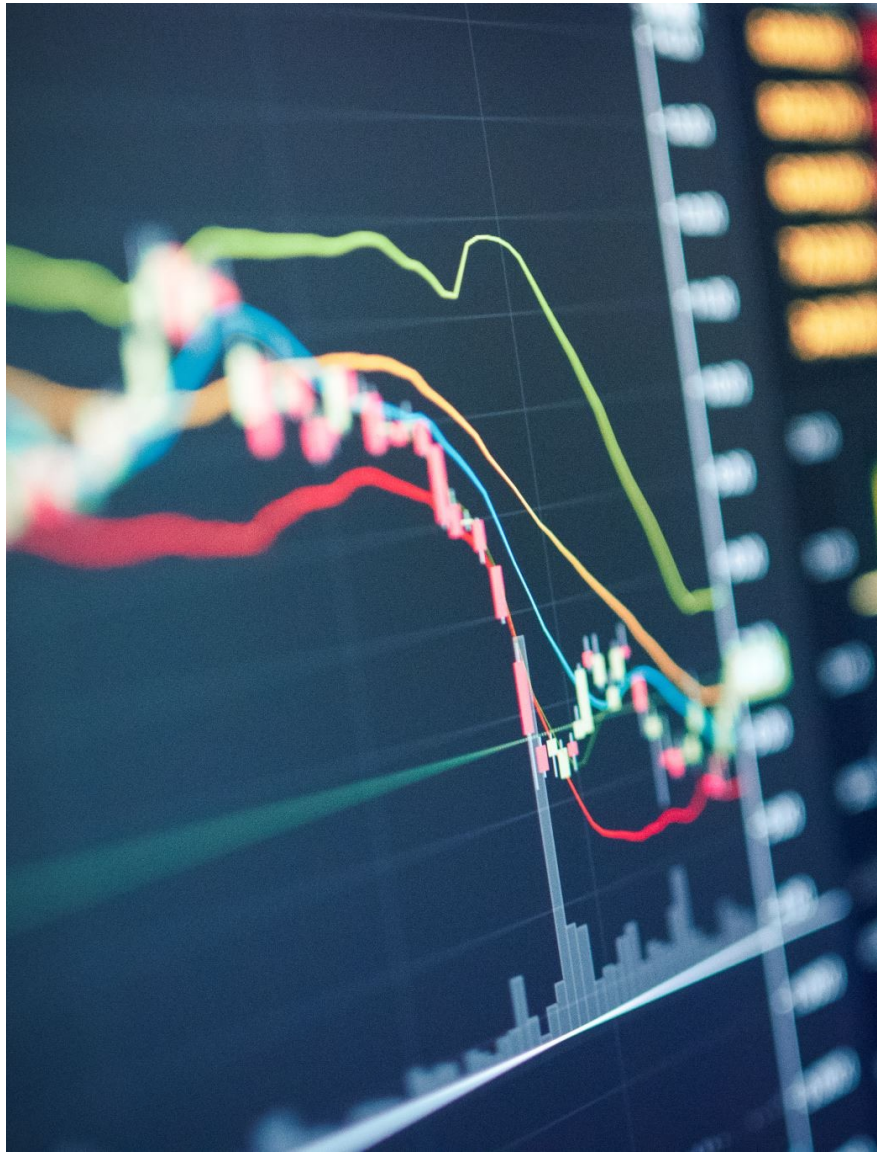
Oeson learning

CAPITAL ASSET PRICING MODEL

- Utilizes the slope coefficient Beta from regression analysis
- Beta measures the relative risk of stocks in comparison to the market.
- Higher beta values indicate higher risk and expected higher returns.

Regression Model:

- Analyzes the relationship between stock returns (%chng) and market return (SP%chng).
- A separate model for each company to determine individual stock behaviors.



RISK ASSESSMENT

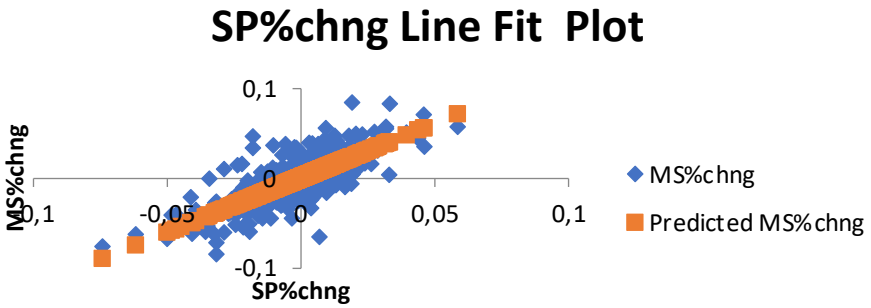
- Beta Values: All three stocks have a beta greater than 1
- suggesting they are all more volatile than the market.

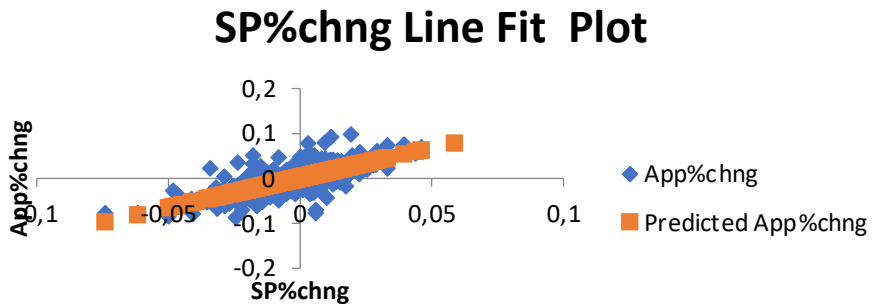
Assessment:

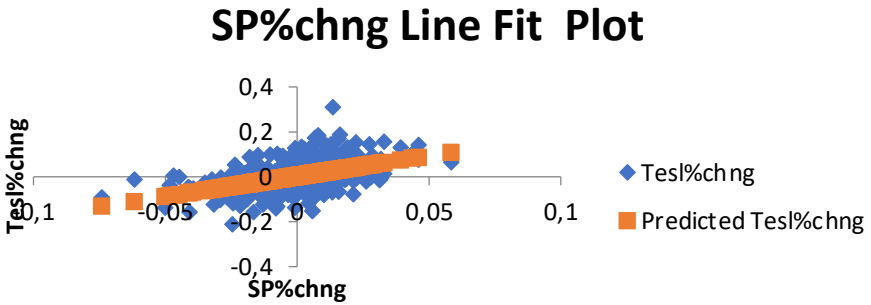
- Microsoft exhibits lower risk with a beta of 1.2138.
- Apple shows moderate risk correlating with its beta of 1.3293.
- Tesla stands out with the highest risk, as indicated by its beta of 1.8183.

Coefficients	MS%chng	Tesl%chng	App%chng
SP%chng	1.2138	1.8183	1.3293

MODEL VISUALIZATION







THE END