Stock Analysis Report

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About Me

- Background in engineering, with a focus on data analysis and financial modelling.
- Skilled in Excel, data visualization, and financial reporting.
- Passionate about understanding market behaviour through statistical techniques.
- Currently exploring the intersection of finance, analytics, and decision making.

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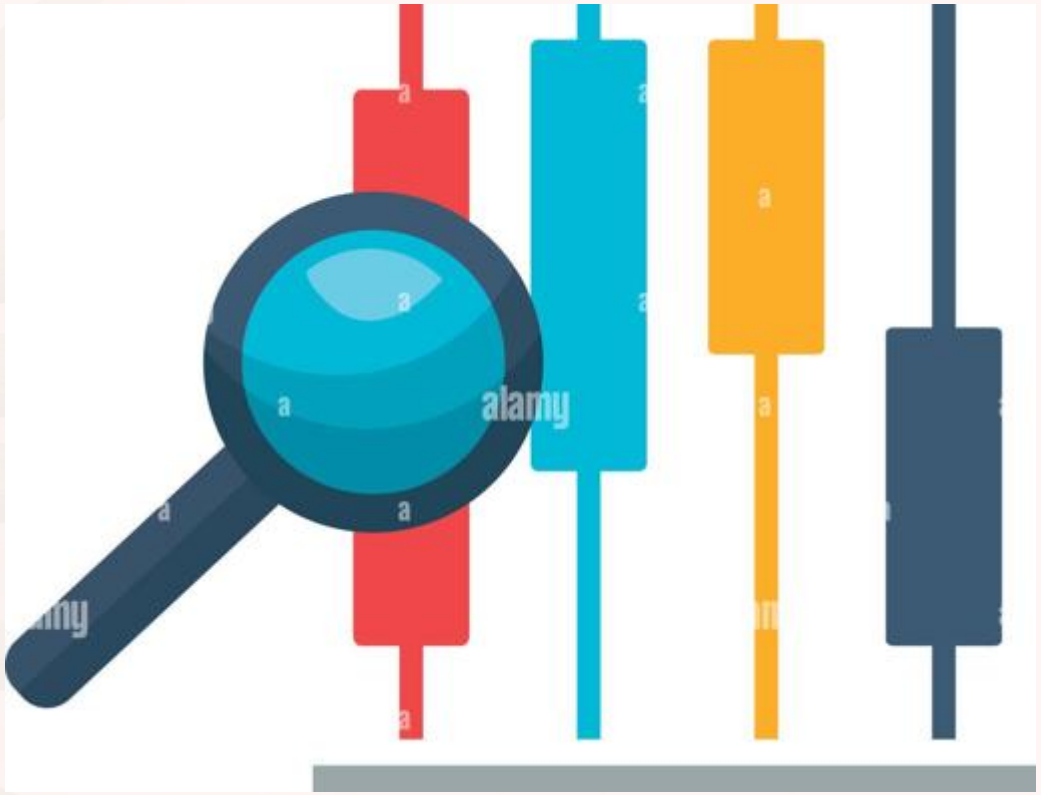


Introduction

- This report analyse the stock performance of Microsoft, Apple, and Tesla using daily data from 2018 to 2023, sourced from Yahoo Finance.
- It also includes the S&P 500 index for market comparison.
- Daily percentage changes in stock prices (%change) are calculated to assess returns and volatility. Using the Capital Asset Pricing Model (CAPM), the Beta coefficient (β) is estimated to measure each stock's risk relative to the market
- This report will analysis the comparison of stock values, regression analysis, statistics analysis.
- This presentation combines real-world financial data with analytical tools to uncover investment insights.

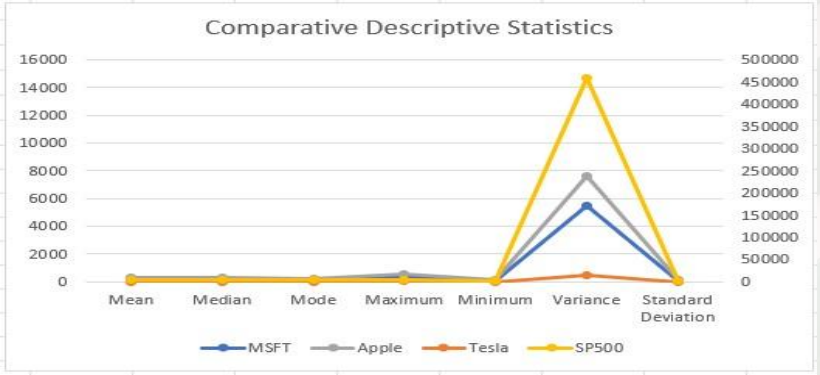
Data Description

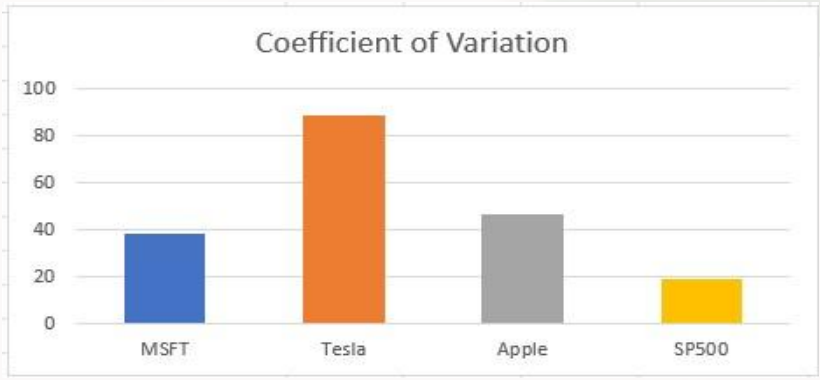
- **Description:** The dataset comprises daily stock price data for three major U.S. companies — Microsoft (MSFT), Apple (AAPL), and Tesla (TSLA) along with the S&P 500 index, serving as a market benchmark sourced from Yahoo Finance.
- **Time Period**: The data spans from January 2018 - December 2023
- **Dataset includes**:
  - Open: stock value at the start of the trading day
  - High: highest stock value on the day
  - Low: lowest stock value on the day
  - Close: stock values when the market closed on the day
  - Adjacent close: adjacent closing value
  - Volume: total number of shares traded on the day
  - %change for each stock: percentage change in open stock value on the day with previous day
- The dataset is used to analyse stock return distributions, volatility, and risk exposure through regression analysis

Date	Open	High	Low	Close	Adj Close	Volume	MS%change
2/1/2018	86.129997	86.309998	85.5	85.949997	80.940384	22483800	
3/1/2018	86.059998	86.510002	85.970001	86.349998	81.317093	26061400	-0.000812713
4/1/2018	86.589996	87.660004	86.57	87.110001	82.032776	21912000	0.006158471
5/1/2018	87.660004	88.410004	87.43	88.190002	83.049843	23407100	0.012357178
8/1/2018	88.199997	88.580002	87.599998	88.279999	83.13459	22113000	0.006160084
9/1/2018	88.650002	88.730003	87.860001	88.220001	83.078087	19484300	0.005102098
10/1/2018	87.860001	88.190002	87.410004	87.82	82.701393	18652200	-0.008911461
11/1/2018	88.129997	88.129997	87.239998	88.080002	82.946259	17808900	0.003073025
12/1/2018	88.669998	89.779999	88.449997	89.599998	84.377647	24271500	0.006127323
16/1/2018	90.099998	90.790001	88.010002	88.349998	83.200516	36599700	0.016127214
17/1/2018	89.080002	90.279999	88.75	90.139999	84.886169	25621200	-0.011320711
18/1/2018	89.800003	90.669998	89.660004	90.099998	84.848495	24159700	0.008082633
19/1/2018	90.139999	90.610001	89.660004	90	84.754318	36875000	0.003786147
22/1/2018	90	91.620003	89.739998	91.610001	86.270493	23601600	-0.001553128
23/1/2018	91.900002	92.300003	91.540001	91.900002	86.543602	23412800	0.021111133
24/1/2018	92.550003	93.43	91.580002	91.82	86.468262	33277500	0.007072916
25/1/2018	92.470001	93.239998	91.93	92.330002	86.94854	26383200	-0.000864419
26/1/2018	93.120003	94.059998	92.580002	94.059998	88.577713	29172200	0.007029328
29/1/2018	95.139999	95.449997	93.720001	93.919998	88.445854	31569900	0.021692396
30/1/2018	93.300003	93.660004	92.099998	92.739998	87.334641	38635100	-0.019339878
31/1/2018	93.75	95.400002	93.510002	95.010002	89.472328	48756300	0.004823119
1/2/2018	94.790001	96.07	93.580002	94.260002	88.766037	47227900	0.011093344
2/2/2018	93.639999	93.970001	91.5	91.779999	86.430595	47867800	-0.012132102

Descriptive Statistics Analysis

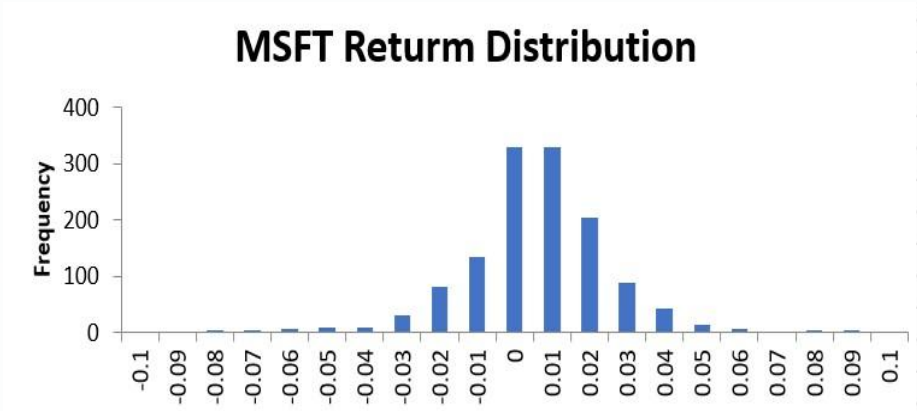
Parameter	MSFT	Tesla	Apple	SP500
Mean	194.511	131.79	98.6465	3457.23
Median	203.05	23.6207	95.615	3298.03
Mode	92.33	23.6207	145.86	2783.02
Maximum	343.11	409.97	182.01	4796.56
Minimum	85.01	11.9313	35.5475	2237.40
Variance	5511.86	13684.1	2133.62	444593.79
Standard Deviation	74.2419	116.979	46.1911	666.78
Coefficient of Variation	38.1686	88.7615	46.8249	19.29





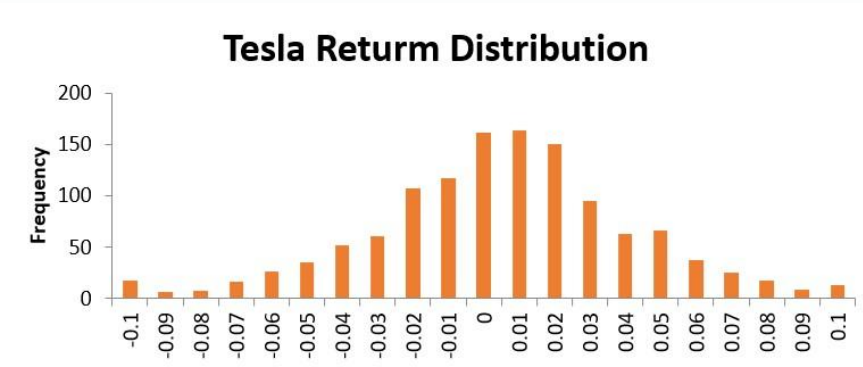
- **Tesla** is the most volatile stock in this dataset, with the highest variance, standard deviation, and coefficient of variation, implying it carries more risk but could offer higher returns.
- **Microsoft** shows relative stability with moderate volatility.
- **Apple** is less volatile than Tesla but more volatile than MSFT.
- The **S&P 500** has moderate volatility compared to individual stocks, benefiting from diversification.

Stock Analysis and Distribution:
Microsoft Stock Trend



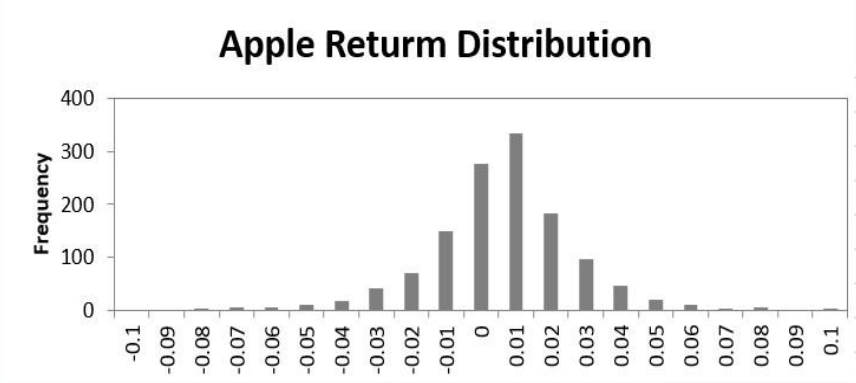
- Microsoft price trend shows that there is a consistent growth with steady increase in price.
- In 2021 there was a high stock however, in the beginning of 2022 on wards there is reduction in price value.
- The return distribution shows that Microsoft stock has maintained an increased trend over the period.

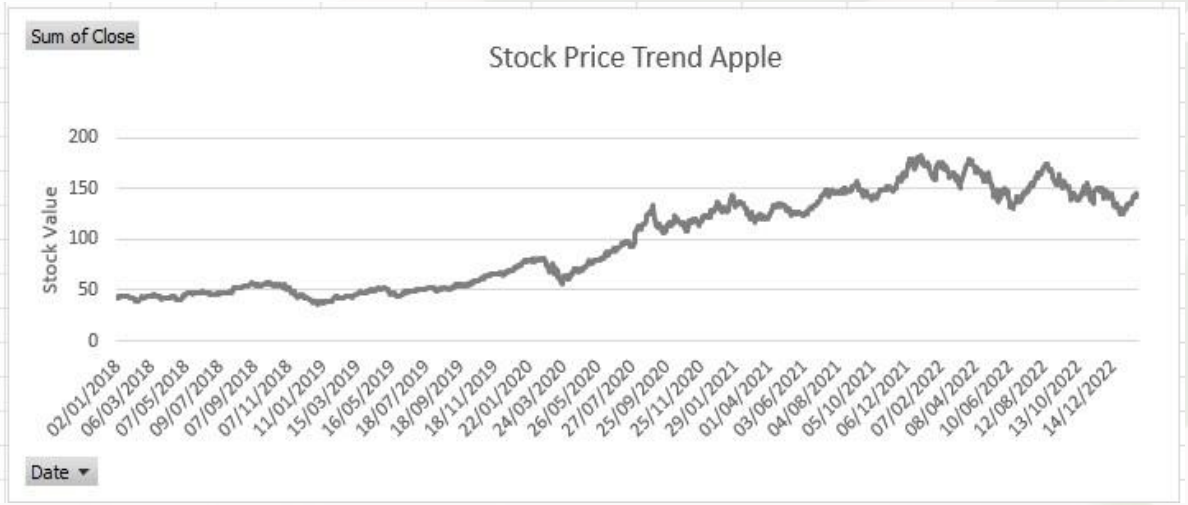
Stock Analysis and Distribution:
Tesla Stock Trend



- Tesla price trend shows that there is a gradually increased in values by the end of 2020.
- In 2022 and 2023 there was a high-risk area where the stock were difficult to predict. High risk means high return.
- The return distribution shows that Tesla stock has a positive trend with more fluctuations over the period.

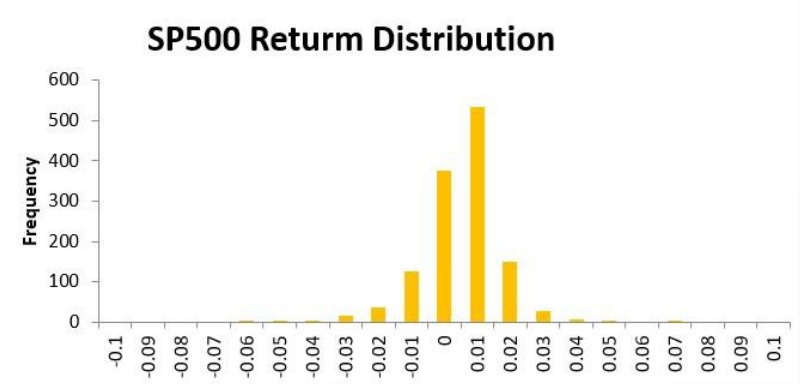
Stock Analysis and Distribution:
Apple Stock Trend





- Apple price trend shows that there is a steady increased in values till 2020 and with gradually ups & down from the start of 2021.
- In 2022 and 2023 there was a high-risk area where the stock were difficult to predict. The stock values between 2021 to 2023 is reduced.
- The return distribution shows that Apple stock has a positive trend with steady growth over the period.

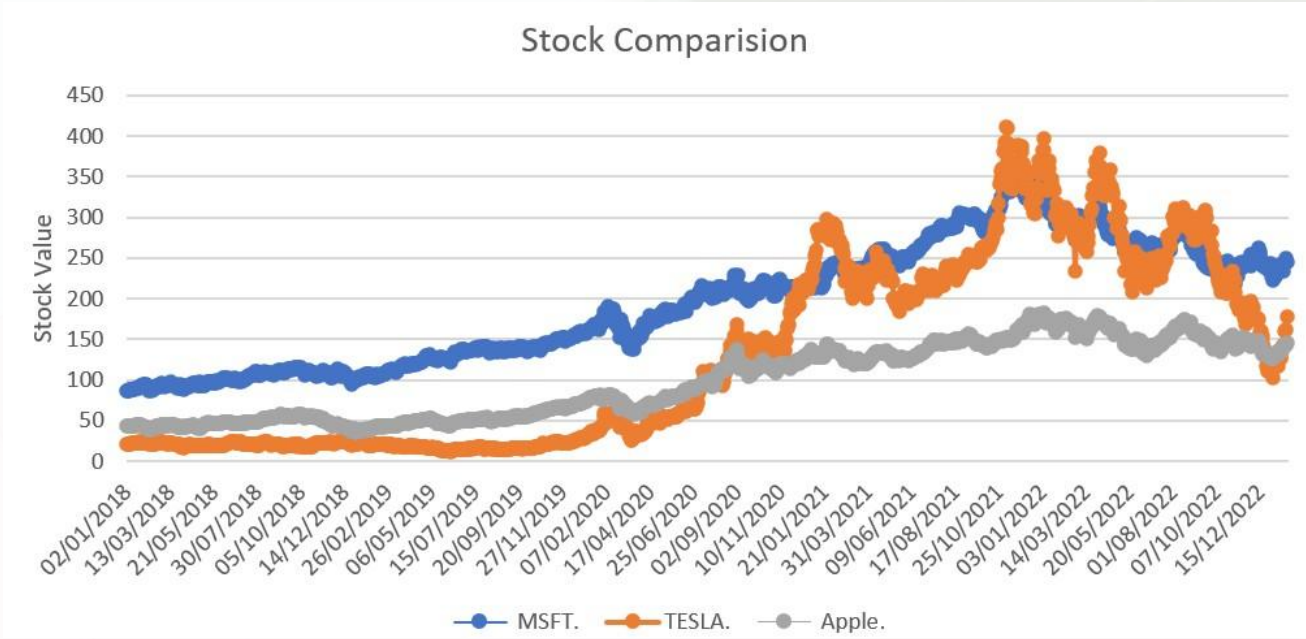
Stock Analysis and Distribution:
SP500 Stock Trend



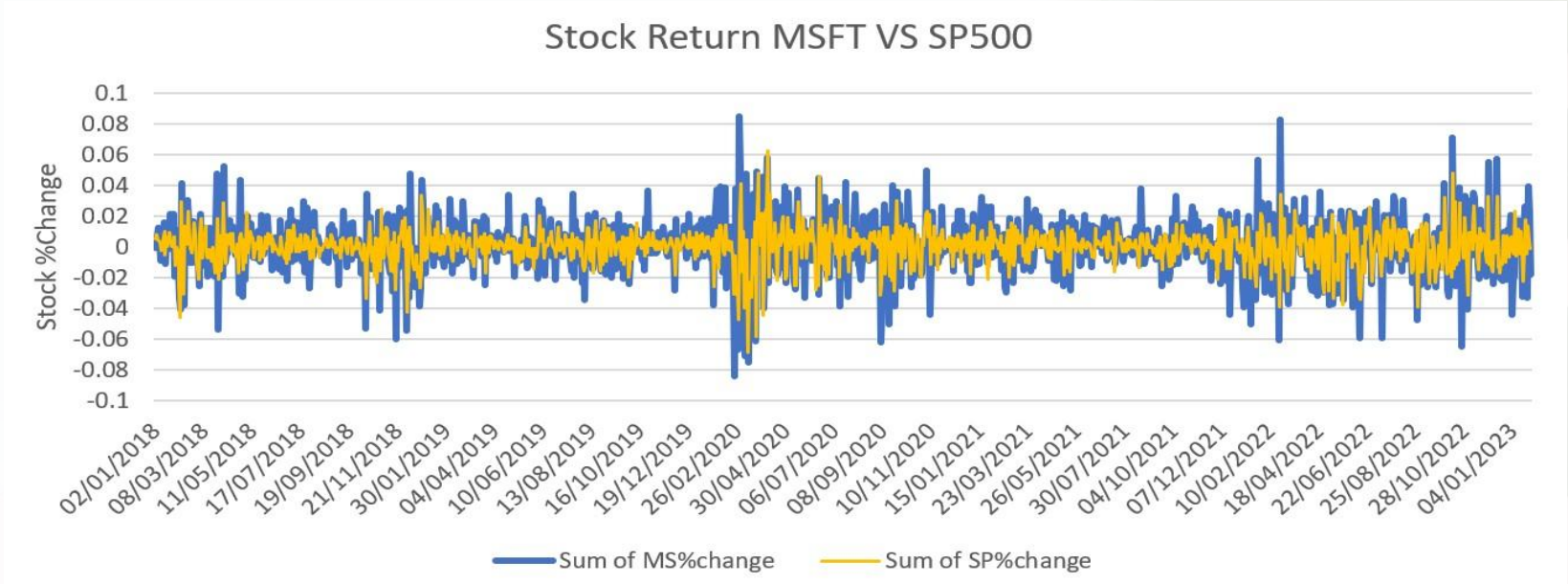
- SP500 price trend shows that there is a steady increased in values till end of 2019 and sudden low deep at the start of 2020 and then an increase in stocks.
- In 2022 and 2023 there was a high-risk area where the stock were difficult to predict. The stock values between 2021 to 2023 is reduced.
- The return distribution shows that SP500 stock has a positive trend with steady growth over the period.

Stock Trend for MSFT, Tessla and Apple

- Apple price trend shows that there is a steady increased in values till 2020 and with gradually ups & down from the start of 2021.
- Microsoft price trend shows that there is a consistent growth with steady increase in price.
- Tesla price trend shows that there is a gradually increased in values by the end of 2020.

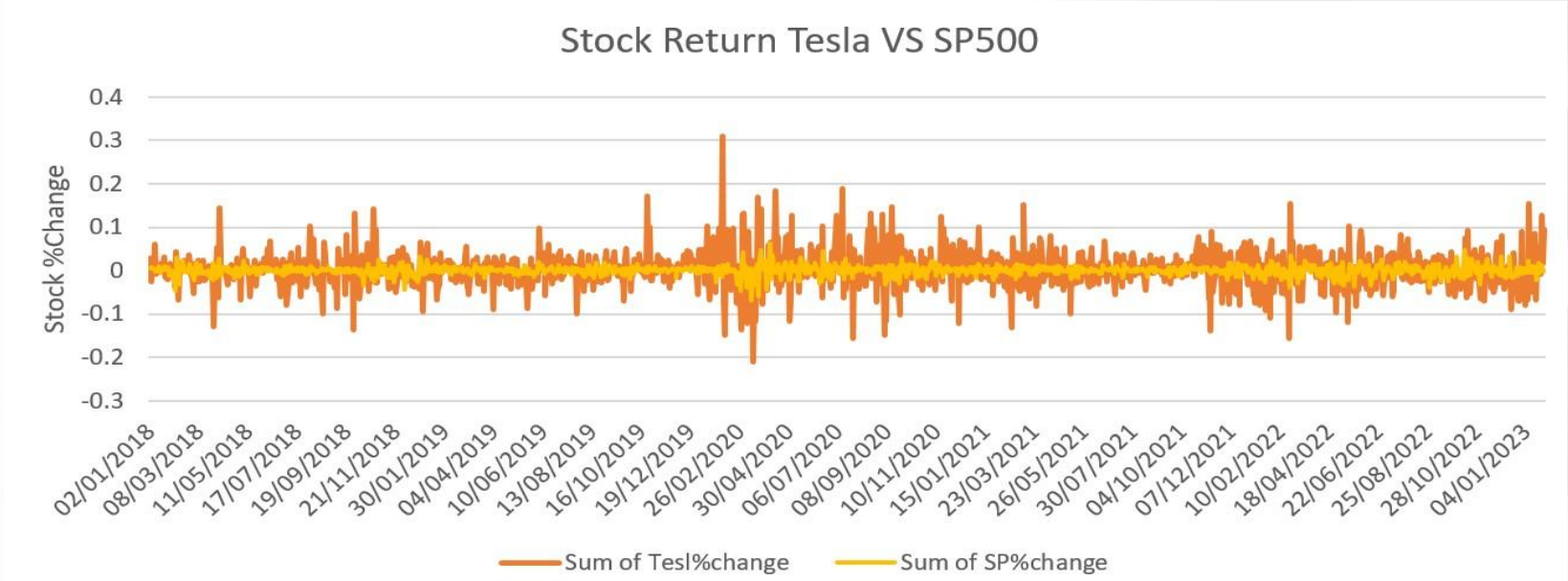


Comparison of Stock Returns: Microsoft and SP500



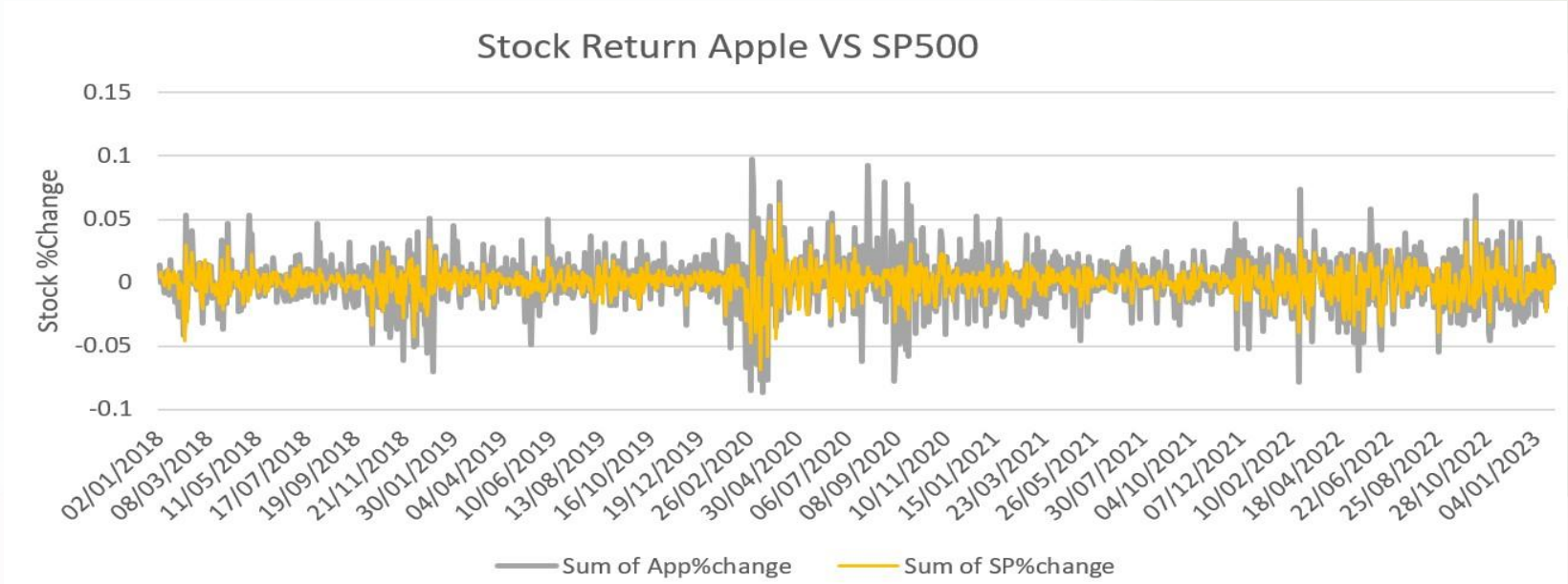
- Microsoft shows a strong price levels, reflecting good performance over the period than SP500.
- Microsoft's return is nearly double that of the S&P 500. this indicating greater price fluctuation.
- Microsoft offers higher returns but with higher risk, while the S&P 500 provides more stable and diversified returns.

Comparison of Stock Returns: Tesla and SP500



- Tesla shows a massive growth potential with a high maximum value indicating strong price surges.
- Tesla is highly volatile — its price fluctuates widely compared to its average.
- Tesla's volatility is over 4.5 times greater than that of the S&P 500, which makes Tesla a high-risk, high-reward stock.
- The S&P 500 shows lower variability and risk, reflecting consistent, diversified market performance..

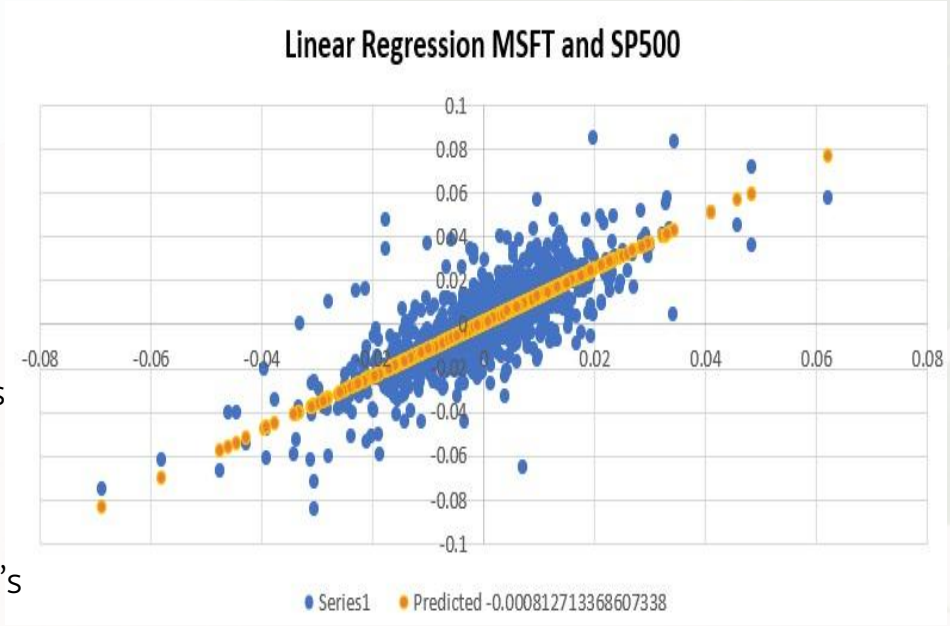
Comparison of Stock Returns: Apple and SP500



- Apple shows a consistent upward trend this suggest a stable growth without extreme outliers.
- Apple indicates moderate volatility but higher than the S&P 500.
- Apple is a growth stock with steady returns and balanced risk, offering a good trade-off between performance and stability.
- The S&P 500, offers lower individual stock returns but provides a broad market exposure and reduced volatility.

Regression Analysis: Microsoft

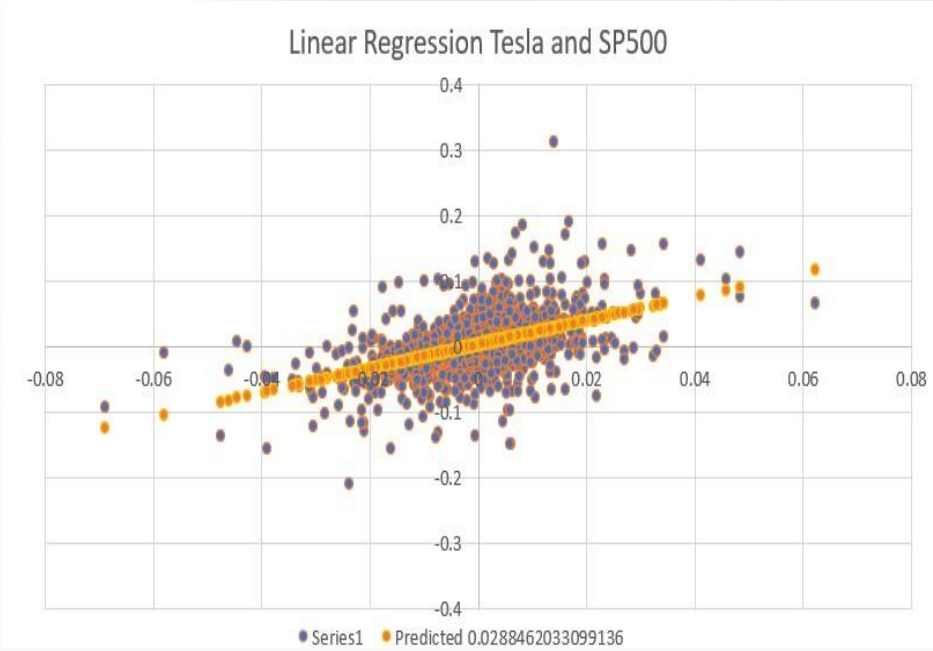
Regression Statistics	
Multiple R	0.777267351
R Square	0.604144535
Adjusted R Square	0.603833817
Standard Error	0.011344282
Observations	1276



- For every 1% change in the S&P 500, Microsoft's return changes by ~1.11%. This shows that Microsoft is slightly more volatile than the market.
- R^2 (R-squared-0.604), this shows that about 60.4% of Microsoft's return variability is explained by the S&P 500's.
- Microsoft returns shows a strong positive relationship.

Regression Analysis: Tesla

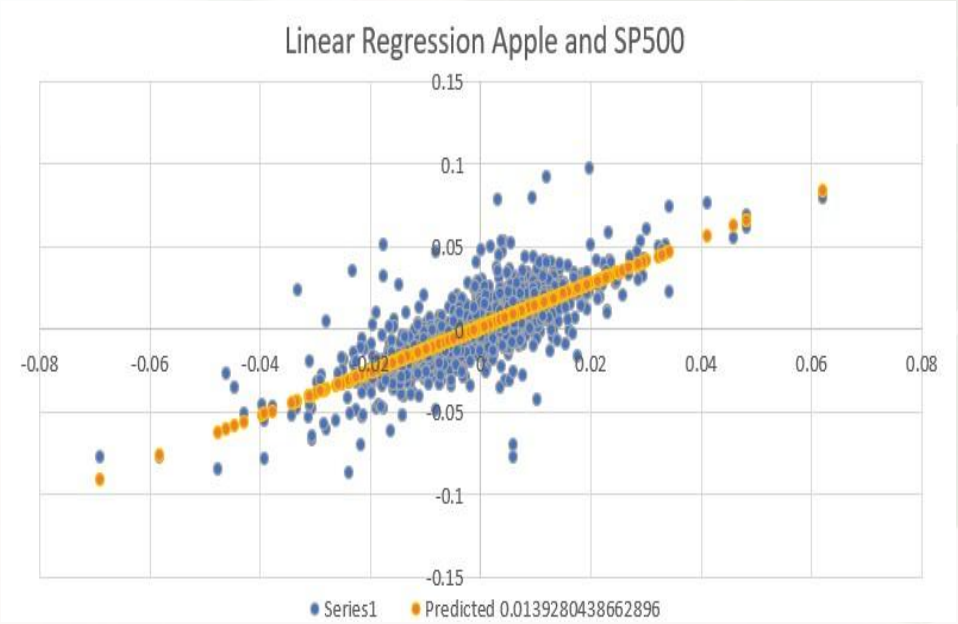
Regression Statistics	
Multiple R	0.481253891
R Square	0.231605308
Adjusted R Square	0.231002172
Standard Error	0.038258302
Observations	1276



- For every 1% change in the S&P 500, Tesla's return changes by ~2.06%. This shows that Tesla is slightly more volatile than the market.
- R^2 (R-squared- 0.231), this indicates that about 23% of Tesla's return variability is explained by the S&P 500.

Regression Analysis: Apple

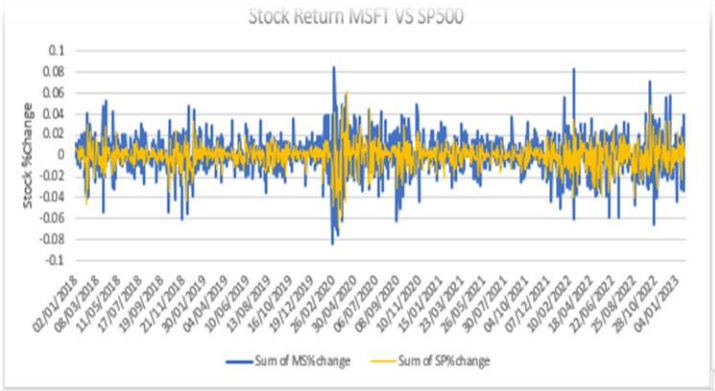
Regression Statistics	
Multiple R	0.741061097
R Square	0.549171549
Adjusted R Square	0.54881768
Standard Error	0.013906498
Observations	1276

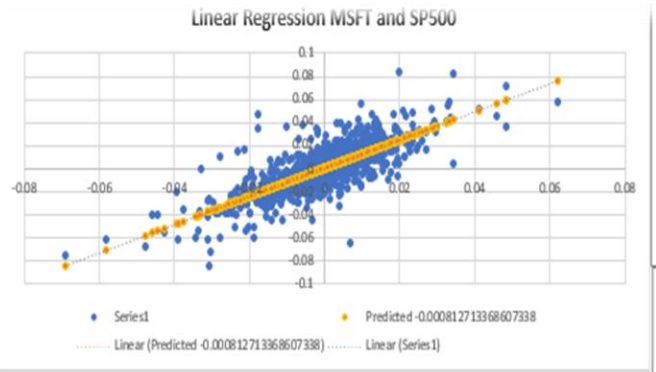


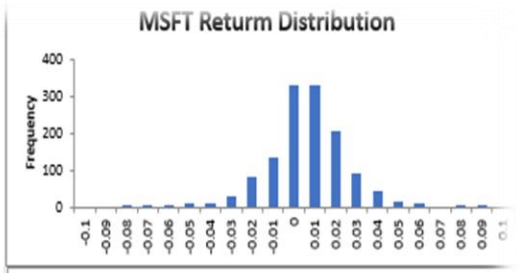
- For every 1% change in the S&P 500, Apple's return changes by ~1.60%. This shows that Apple is slightly more volatile than the market.
- R^2 (R-squared-0.549), this shows that about 55% of Apple's return variability is explained by the S&P 500's.
- Apple returns shows a strong positive relationship.

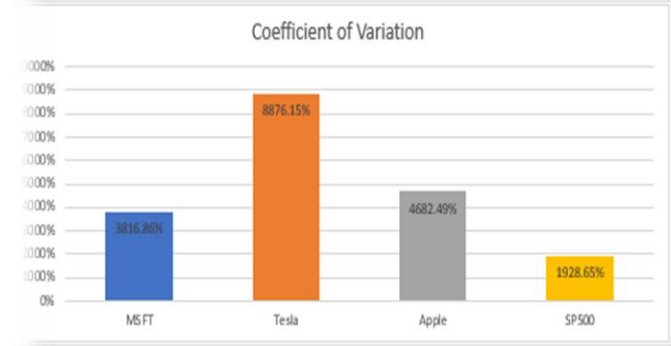
Dashboard

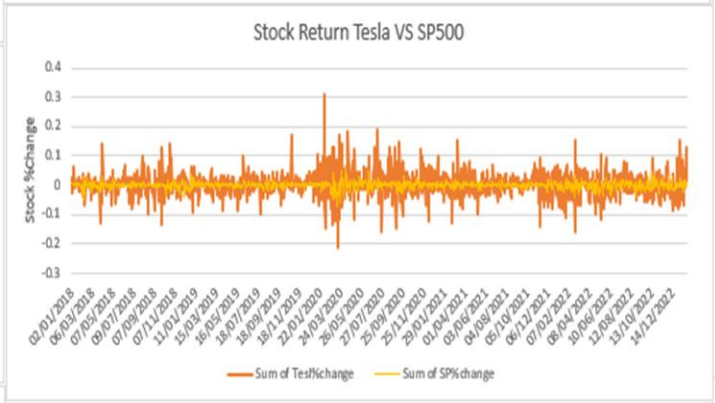
Stock Comparision
Stock Value
MSFT.
TESLA.
Apple.


Stock Return MSFT VS SP500
Stock %Change
Sum of MS%change
Sum of SP%change


Linear Regression MSFT and SP500
Series1
Predicted -0.000812713368607338
Linear (Predicted -0.000812713368607338)
Linear (Series1)

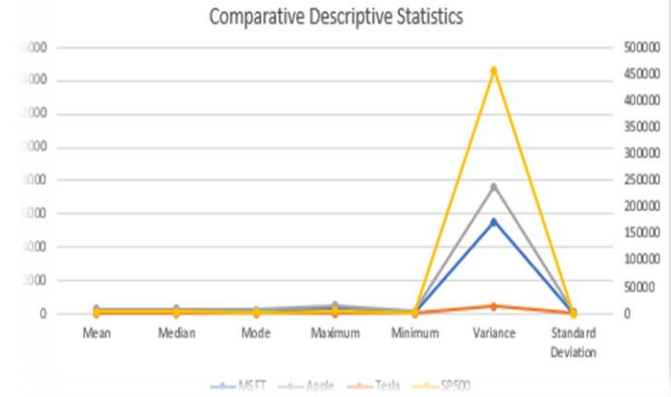

MSFT Return Distribution
Frequency

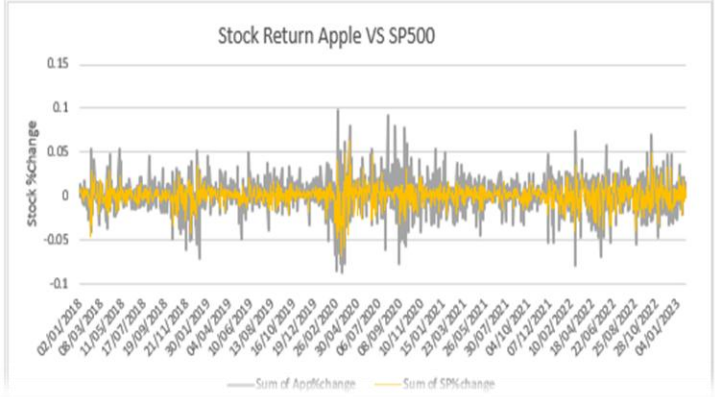

Coefficient of Variation
3816.86%
8876.15%
4682.49%
1928.65%
MSFT
Tesla
Apple
SP500

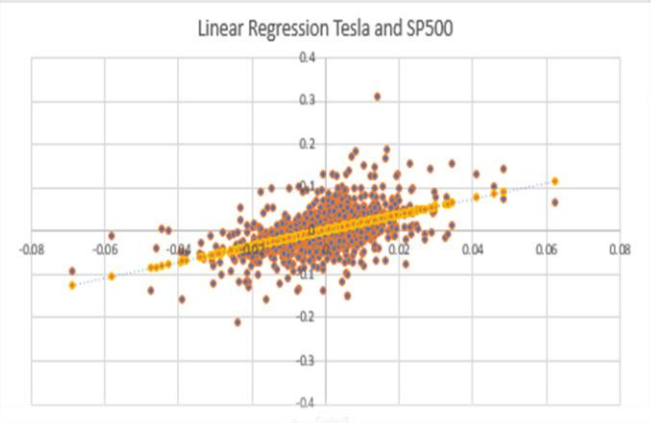

Stock Return Tesla VS SP500
Stock %change
Sum of Tes%change
Sum of SP%change

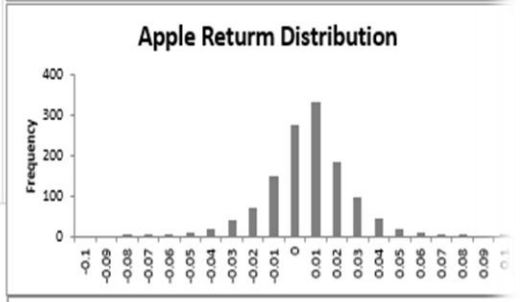
Linear Regression Apple and SP500
Series1

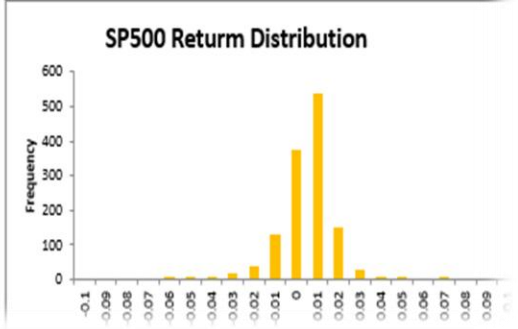
Tesla Return Distribution
Frequency


Comparative Descriptive Statistics
Mean
Median
Mode
Maximum
Minimum
Variance
Standard Deviation


Stock Return Apple VS SP500
Stock %change


Linear Regression Tesla and SP500


Apple Return Distribution
Frequency


SP500 Return Distribution
Frequency

Conclusion

- The Stock analysis report gives insights for various variable for the Microsoft, Tesla, Apple and SP500 companies. The key insights are detailed below:
  - Microsoft offers potentially higher returns than the S&P 500 but at the cost of greater volatility and market sensitivity. For risk-tolerant investors, MSFT may be more attractive during bullish periods. However, for consistent and diversified exposure, the S&P 500 provides lower-risk, broad market performance.
  - Tesla delivers the highest potential returns among the stocks analysed but also carries significantly higher risk and volatility. It is suited for aggressive investors comfortable with sharp price swings. In contrast, the S&P 500 remains a safer, stable investment, ideal for long-term, risk-averse portfolios.
  - Apple provides a strong and stable return profile, making it attractive for investors looking for growth with moderate risk. Compared to the S&P 500, Apple offers higher return potential at the cost of slightly increased volatility, whereas the S&P 500 is ideal for long-term stability and diversification.

Thank you

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Oeson Learning