

Stock Market Analysis

Stock Market Analysis of Microsoft, Apple, Tesla, and S&P 500 (2018-2023)



Introduction to the Stock Market and S&P 500:

The **stock market** is a platform where investors buy and sell shares of publicly traded companies. It serves as a critical component of the global economy by providing companies with access to capital for growth, while offering investors the opportunity to share in the profits of businesses.

One of the most important measures of the U.S. stock market's performance is the **S&P 500 index**. This index tracks the stock prices of 500 of the largest companies listed on U.S. stock exchanges, including major corporations like Microsoft, Apple, and Tesla. It is widely used by investors as a benchmark to gauge the overall health and performance of the U.S. economy.

Understanding the S&P 500 helps investors compare the performance of individual stocks, such as Microsoft or Tesla, against the broader market. In this project, I use the S&P 500 as a key point of comparison to evaluate how the stock prices of Microsoft, Apple, and Tesla performed between 2018 and 2023.

Project Description:

This project analyzes the stock price data of Microsoft, Apple, Tesla, and the S&P 500 from 2018 to 2023. Using daily stock data retrieved from Yahoo Finance, the focus is on understanding the stock trends, descriptive statistics, and comparative analysis between the individual stocks and the S&P 500. The project also includes an optional regression analysis to evaluate the relationship between stock returns and the market's performance.

Objectives:

- Perform a comparative analysis of stock prices and trends for Microsoft, Apple, Tesla, and the S&P 500.
- Calculate and analyze key statistical measures such as mean, median, standard deviation, and variance.
- Visualize stock trends through charts (line plots, scatter plots, histograms).

Data Sources:

- Daily stock values for Microsoft, Tesla, Apple, and S&P 500, extracted from Yahoo Finance between 2018 and 2023.
- Variables include Open, High, Low, Close, Volume, and %Change.

Date	Open	High	Low	Close	Adj Close	Volume	Tesl%change
2/1/2018	20.799999	21.474001	20.733334	21.368668	21.368668	65283000	
3/1/2018	21.4	21.683332	21.036667	21.15	21.15	67822500	0.028846203
4/1/2018	20.858	21.236668	20.378668	20.974667	20.974667	149194500	-0.0253271
5/1/2018	21.108	21.149332	20.799999	21.105333	21.105333	68868000	0.011985809
8/1/2018	21.066668	22.468	21.033333	22.427334	22.427334	147891000	-0.00195812
9/1/2018	22.344	22.586666	21.826668	22.246	22.246	107199000	0.060632844
10/1/2018	22.146667	22.466667	22	22.32	22.32	64648500	-0.00883159
11/1/2018	22.349333	22.987333	22.217333	22.530001	22.530001	99682500	0.009151084
12/1/2018	22.575333	22.694	22.244667	22.414667	22.414667	72376500	0.010112159
16/1/2018	22.502666	23	22.32	22.670668	22.670668	97114500	-0.00321887
17/1/2018	22.698	23.266666	22.65	23.143999	23.143999	106552500	0.008680483
18/1/2018	23.044666	23.486668	22.916	22.971333	22.971333	85287000	0.015272976
19/1/2018	23	23.372667	22.84	23.334667	23.334667	73324500	-0.00193824
22/1/2018	23.293333	23.855333	23.280001	23.437332	23.437332	93156000	0.012753609
23/1/2018	24	24.033333	23.4	23.519333	23.519333	81981000	0.030337737
24/1/2018	23.638666	23.65	22.901333	23.059334	23.059334	79312500	-0.01505558
25/1/2018	23.218	23.280001	22.426666	22.509333	22.509333	101104500	-0.01779567
26/1/2018	22.766666	22.933332	22.380667	22.856667	22.856667	68091000	-0.01943897
29/1/2018	22.656668	23.389999	22.552	23.302	23.302	71206500	-0.00483154

Descriptive Statistics and Comparative Analysis:

Each stock's key descriptive statistics, including mean, median, maximum, minimum, variance, and standard deviation, were computed. These metrics helped identify central tendencies and variability for each stock compared to the S&P 500.

Insights:

- **Microsoft and Apple:** Stable growth with lower volatility, indicating safer long-term investments.
- **Tesla:** High volatility, presenting higher risk but potentially higher returns.
- **S&P 500:** A broad measure of market performance with moderate volatility.

Microsoft Statistics					
Statistics Summary	Open	High	Low	Close	Adj Close
Mean	194.47	196.52	192.3	194.51	190.83
Median	203.58	205.19	201.32	203.05	198.82
Mode	95.14	107.9	89.66	92.33	89.88
Count	1278	1278	1278	1278	1278
Max	344.62	349.67	342.2	343.11	339.92
Min	86.06	86.31	83.83	85.01	80.06
Variance	5510.45	5625.4	5387.52	5511.86	5653.29
Standard Deviation	74.23	75	73.4	74.24	75.19

Tesla Statistics					
Statistics Summary	Open	High	Low	Close	Adj Close
Mean	131.9	134.96	128.51	131.79	131.79
Median	96.57	100.32	94.27	97.64	97.64
Mode	24	21.5	21.77	23.62	23.62
Count	1278	1278	1278	1278	1278
Max	411.47	414.5	405.67	409.97	409.97
Min	12.07	12.45	11.8	11.93	11.93
Variance	13728.01	14356.1	13027.4	13684.1	13684.1
Standard Deviation	117.17	119.82	114.14	116.98	116.98

Apple Statistics					
Statistics	Open	High	Low	Close	Adj Close
Mean	98.57	99.78	97.42	98.65	97.39
Median	95.09	96.31	93.98	95.62	94.15
Mode	127.82	151.57	133.77	145.86	41.25
Count	1278	1278	1278	1278	1278
Max	182.63	182.94	179.12	182.01	180.96
Min	35.99	36.43	35.5	35.55	34.31
Variance	2132.24	2187.72	2076.34	2133.62	2168.54
Standard	46.18	46.77	45.57	46.19	46.57

S&P500 Statistics					
Statistics	Open	High	Low	Close	Adj Close
Mean	3457.03	3478.39	3433.65	3457.23	3457.23
Median	3294.67	3318.71	3280.18	3298.03	3298.03
Mode	2832.41	2761.85	2697.77	2783.02	2783.02
Count	1278	1278	1278	1278	1278
Max	4804.51	4818.62	4780.04	4796.56	4796.56
Min	2290.71	2300.73	2191.86	2237.4	2237.4
Variance	444300.94	449064	439507	444594	444594
Standard	666.56	670.12	662.95	666.78	666.78

Descriptive Statistics of Microsoft, Tesla, Apple, and S&P 500 (2018-2023)

The tables above present key descriptive statistics for the stock prices of **Microsoft**, **Tesla**, **Apple**, and the **S&P 500** index. Key metrics include the mean, median, mode, maximum, minimum, variance, and standard deviation of the daily **Open**, **High**, **Low**, **Close**, and **Adjusted Close** prices over the period from 2018 to

2023. These statistics provide insights into the central tendency and variability of the stock prices for each company compared to the broader market, represented by the S&P 500.

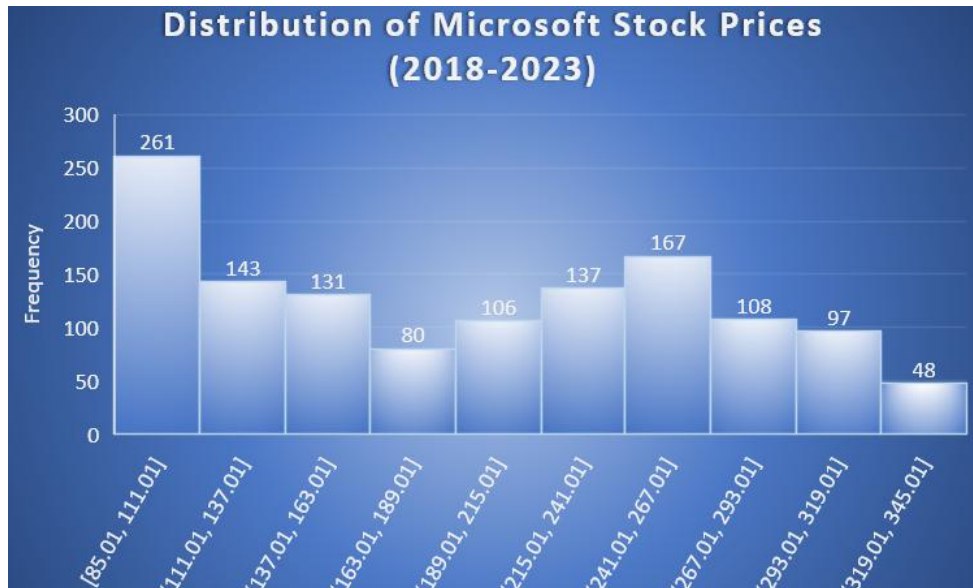
Stock Price Trend Visualization (2018-2023):





Stock Price Trends for Microsoft, Tesla, Apple, and S&P 500 (2018-2023)

The charts above display the stock price trends of **Microsoft, Tesla, Apple**, and the **S&P 500** from 2018 to 2023. The graphs show the daily closing prices for each stock, highlighting key points of growth and volatility. Tesla exhibits the most significant fluctuations, while Microsoft and Apple demonstrate steady upward trends. The S&P 500, as a market benchmark, reflects broader economic movements over this period. These visualizations provide insights into how each stock performed compared to the overall market.





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Conclusion:

This project concludes that Microsoft's stock is the most predictable based on market trends, while Tesla presents the most significant risk and volatility. Apple provides a middle ground with moderate correlation to market trends.