## Stock Market Analysis

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

A screenshot of a stock exchange

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**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.

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**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.

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*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)**:

A graph showing the price of a stock market

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A graph of a stock price trend

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A graph showing the growth of the apple stock price trend

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A graph of a stock price trend

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*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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A graph of a number of numbers and a number of bars

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A graph of a distribution of apple stock prices

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A graph of a number of stock prices

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*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.

**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.