Decoding the impact: How Financial News Sentiment shapes Microsoft's and Apple's Stocks Market Performance

INTRODUCTION

Traders and investor often seek to understand market sentiment and its impact on the stock price. Analysing news articles, social media post and other textual data manually can be time consuming and subjective.

This article propose a solution by utilizing the News API and Yahoo Finance API that provide real time and historical data on Microsoft and Apple stock performance market sentiment from the financial news.

Moreover, an interactive chart offers a clear visual representation of sentimental scores and the stock price. By comparing the sentimental scores and stock price, we can identify patterns and correlation that reveals how news sentiment influence the market behaviours

METHODOLOGY

Data collection

Data for this analysis has been collected two different sources News API and Yahoo Finance (yfinance)

[News API – Search News and Blog Articles on the Web](#)

Important note:

- When conducting sentiment analysis or fetching financial data via APIs, using "AAPL" as a keyword allows for efficient and accurate retrieval of relevant information related specifically to Apple Inc.'s stock and market sentiment.
- Investors and analysts commonly refer to companies by their ticker symbols (e.g., "AAPL" for Apple, "MSFT" for Microsoft) in financial discussions and analyses. Using "AAPL" aligns with industry conventions and ensures that the analysis is relevant to the financial community.

Sentiment Analysis

Implement the natural language processing (NLP) techniques to perform sentimental analysis on collected textual data. This process involves analysing the text to determine the sentiment, categorizing it as positive, negative or neutral.

The sentiment analysis helps us understand the mood of the new articles. We can then compare this mood with stock prices to find any important connections or patterns.

Data integrity

Before saving the data to a CSV file, ensure that there are no missing values and remove any duplicates.

Apple CSV File:

raw.githubusercontent.com/HAZCHEM234/My_data/main/UpdateAAPL__2024-06-29_data.csv

Microsoft CSV File:

raw.githubusercontent.com/HAZCHEM234/My_data/main/UpdateMSFT__2024-06-30_data.csv
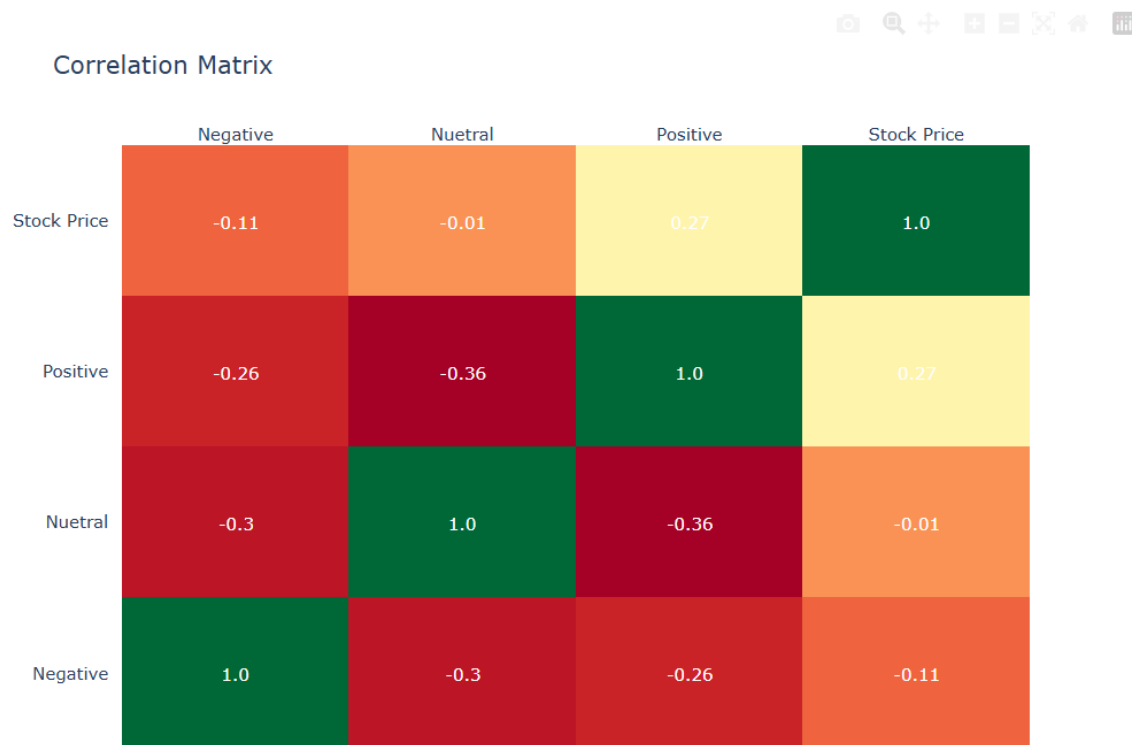
Visualization

Using Matplotlib and Plotly to visualize sentiment trends over time and compare them with stock price movement, alongside a correlation matrix to measure the interrelationship between sentiment scores and stock market price.

RESULTS

Apple Inc (AAPL)

Correlation Heatmap

Correlation Matrix

Positive Sentiment vs Stock Price

- Correlation coefficient: 0.27
- There is a positive correlation between positive sentiment and stock price. This means that as a positive sentiment increase, the stock price tend to increase as well.
- However the correlation is not very strong (0.27) suggesting a modest relationship

Negative sentiment vs stock price

- Correlation coefficient -0.11
- There is a weak negative correlation between Negative Sentiment and Stock Price. This means that when the negative sentiment goes up. The stock price tend to go down slightly.
- However the relationship is very weak, so the change in stock price isn't strongly linked to negative sentiment
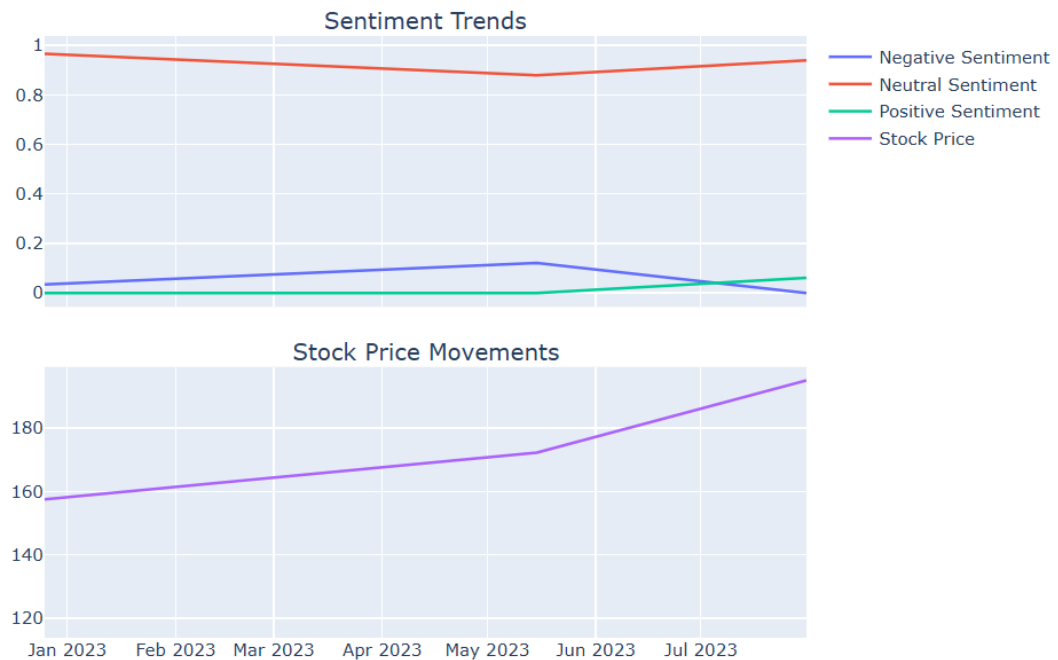
Neutral sentiment vs stock price

- Correlation coefficient: -0.012
- There is an almost negligible negative correlation between neutral sentiment and stock price. This indicate that neutral sentiment has very little impact on stock price movement.

AAPL Analysis

Sentiment and Stock Price

AAPL Sentiment Trends and Stock Price Movements

Important note: the stock price movement reflects the value on publication date of the article, not the daily trend

Findings

On 31 July 2023, the positive news sentiment increased to 0.061, and the stock price rise from 172.2 on 15 May 2023 to 195.0 on 31 July 2023.

On 15 May, the negative news sentiment increased to 0.121, and the stock price gradually rose from 151.7 on 31 October to 172.2 on 15 May 2023

Apple's overall implication

The positive correlation between the positive sentiment and stock price suggest that the market participant respond positively to good news about the company, driving the stock price up. This aligns with the general understanding that the positive news can boost investor confidence and buying interest.
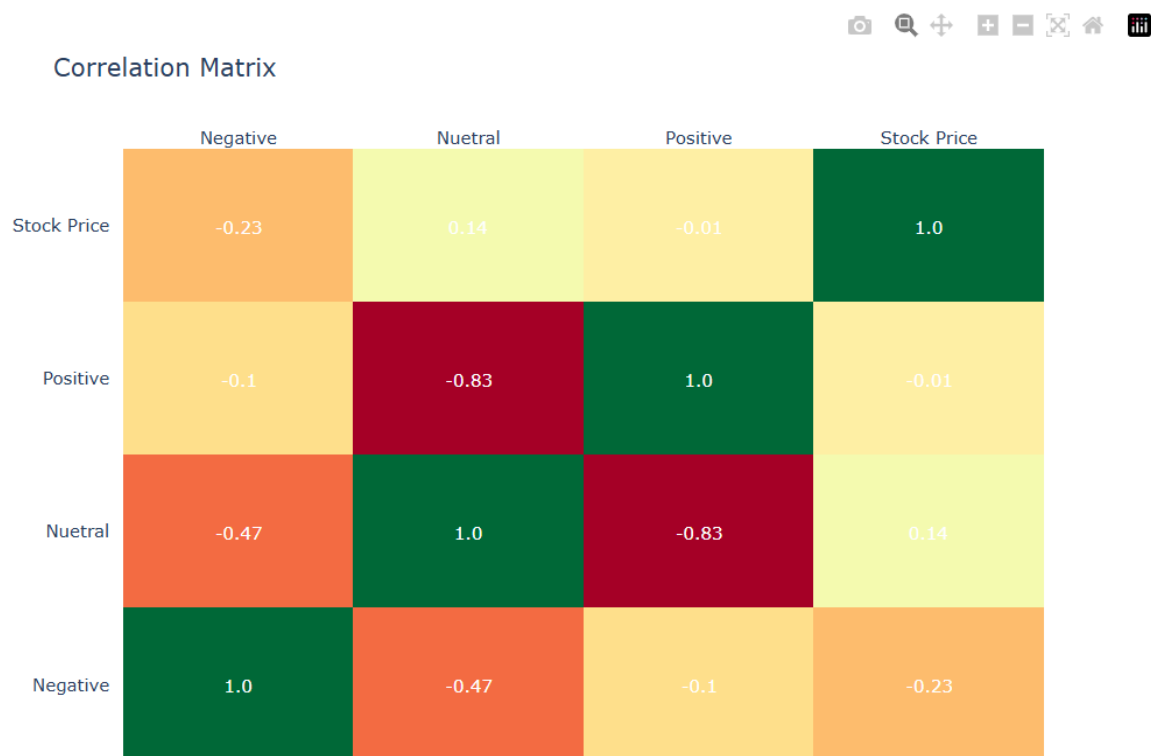
The weak correlation between negative sentiment and stock price implies that negative news has a relatively minor impact on the stock price in this dataset. This might indicate that investor are not heavily swayed by negative sentiment or other factors mitigating its impact.

The correlation suggest that investor might be responsive to positive news than negative news when it comes to this particular stock. This could be due to strong underlying reasons, positive market outlook or other factor that keep investor confident despite occasional negative news

Analysing the sentiment of news related to Apple Inc serves as an illustration. Now let's explore how news sentiment about Microsoft impacts its stock prices.

Microsoft (MSFT)

Correlation Heatmap

Positive sentiments vs stock price

- Correlation coefficient: -0.01

- The slight negative correlation between positive sentiment and stock price in this data sets suggest that changes in positive sentiment have very little no effect on the stock prices
- This means that base on the data stock price does not significantly increase or decrease in response to positive sentiment.

Negative sentiment vs stock price

- Correlation coefficient: -0.23
- There is a weak negative correlation between negative sentiment and stock price.
- This implies that the increase in negative sentiment is associated with a slight decrease in stock price. Although the correlation is not very strong it is more noticeable than the effect of the positive sentiment.

Neutral sentiment vs stock price

- Correlation coefficient: 0.14
- There is a weak positive correlation between neutral sentiment and stock price
- This suggest that as neutral sentiment increase the stock price tends to increase slightly. However the correlation is weak, indicating a minimal impact

MSFT Analysis

Sentiment and Stock Price

MSFT Sentiment Trends and Stock Price Movements
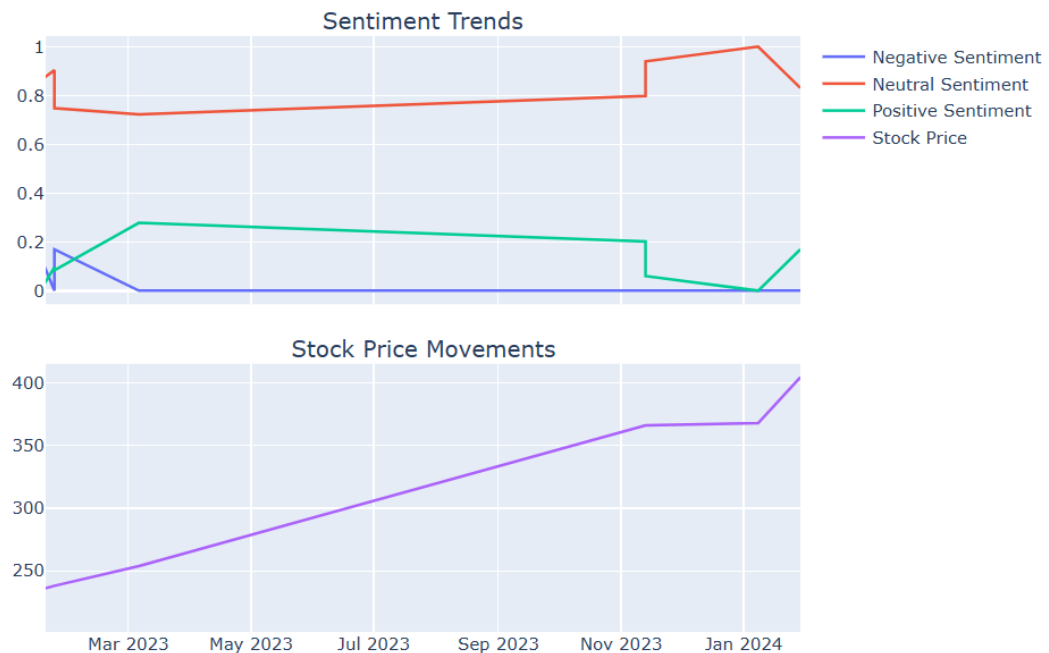
Important note: the stock price movement reflects the value on publication date of the article, not the daily trend

Findings

November 13, 2023, the sentiment scores dropped from 0.2 to 0.06, and then to 0 on January 8, 2024, while Microsoft's stock price increased from 366.1 to 367.95. This suggest that even though sentiment scores went down, Microsoft's stock price stayed strong, showing that investors still had confidence in the stock

On January 29, 2024, the sentiment scores increased to 0.169, and Microsoft's stock price rose from 367.95 on January 8 to 404.6. This indicates that the sentiment scores improved, Microsoft stock price increases suggesting that positive changes in sentiment may have contributed to boosting investor confidence and driving up the stock prices.

Microsoft overall implication

The almost zero correlation between positive sentiment and stock price suggest that the positive news or sentiment does not significantly influence the stock price in this datasets. Investor might be ignoring positive sentiment or other factor might be overshadowing this impact.

The weak negative correlation between negative sentiment and stock price indicate the negative sentiment has a slight stronger effect on the stock price compared to positive sentiment. However the effect is still relatively weak suggesting that negative news does not heavily drive stock price decline.

The weak positive correlation between neutral sentiment and stock price suggest that neutral sentiment has a minimal but positive minimal impact on the stock price. Investor might view neutral sentiment as a stable or slightly positive indicator.

Overall Findings

Apple: Positive news strongly influences Apple's stock price, likely due to the company's robust market position and the high confidence investors have in its performance. Negative news, while still impactful, has a smaller effect on Apple's stock, reflecting the resilience and trust investors maintain in the company's stability and potential for growth.

Microsoft: Positive news has almost no effect on Microsoft's stock prices, while negative news has a small impact. Neutral sentiment has a slight positive effect, suggesting that investors remain stable or slightly optimistic about the stock.

DISCUSSION

The results indicates how different company such as Apple and Microsoft, react to the news sentiment in the stock market

Apple positive news strongly influence Apple stock price. Investor perceive Apple as a company with strong market position and growth potential. Negative news while impactful, negative news have smaller effect on Apple stock price compare to positive news. Investor have confidence in Apple's stability showing resilience even when the company encounters occasional setbacks.

Microsoft's positive news has almost no effect on Microsoft stock price. This suggest that positive news, while they are helpful, it does not change how investor see Microsoft, even the company is already viewed as stable and well established. Microsoft's negative news has a small impact on Microsoft stock price. This suggest that negative news might slight concert investor, but it doesn't affect them as much as it might for other companies.

Understanding how different companies respond to news sentiment is crucial because

- **Investment decision** – Investor can use this information to adjust their investment strategies
- **Risk management** – companies with high sensitivity to news sentiment may require different risk management strategies compare to those with low sensitivity
- **Market insight** – theses insight provide deeper understanding of market dynamics and investor behaviour. Analysts use this information to predict stock movement and gauge how people feel about certain companies.

There are limitations of the results such as

- **Causality** – The result indicates correlation between news sentiment and stock price movement, but they do not establish causality. Its important to also think about other thing could be affecting both news feeling and stock price at the same time as market trend, economic sign or specific thing happening in that industry
- **Short term vs long term** – the study focuses on immediate or short-term effect of news sentiment on stock price. Long term impact such as big decision by the company, changes in the industry or overall economic condition might have different impact that weren't included in the study
- **The findings apply specifically to Apple and Microsoft**. Different companies in various industries or with different market situations may respond differently to news sentiment. Separate analyses are needed to apply findings more broadly

There are recommendations for further studies:

- **Longitudinal analysis** – studying trend over long period could show how the connection between news sentiment and stock price changes over time, including possible delayed effects
- **Comparative analysis** – to broaden the study, include wider ranges of companies from various industries to see if the pattern observed apply universally or if there are differences specific to certain industries
- **Sentiment analysis techniques** – investigate advance method like sentiment intensity, entity sentiment or sentiment propagation model to better understand how different aspect of new sentiment impact the stock prices.

CONCLUSION

Apple positive news significantly boost Apple stock due to strong market position and high investor confidence. The negative news have smaller effect, reflecting investor trust in apple stability and growth. Microsoft positive news have little effect on Microsoft stocks. While negative news has a modest impact. Neutral sentiment slightly increase the stock, indicating or mildly optimistic investor outlook.

Understanding the different sensitivities of major companies like Apple and Microsoft to news sentiment is crucial for investor. It can inform better decision making and risk assessment.

Recognizing how different types of new affect stock price can provide valuable insights for investment strategies, emphasizing the importance of company-specific analysis in financial markets.

REFERENCES

GitHub code: [HAZCHEM234/Stock_sentiments_Analysis (github.com)](github.com)

GitHub data [HAZCHEM234/My_data: This repository contains the data I collected (github.com)](github.com)

News API: [News API – Search News and Blog Articles on the Web](github.com)