

US and China Geopolitical Tension Impact on TSMC Stock Price





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Executive Summary

US-China relations have a major impact on global markets, and TSMC, a leading semiconductor company, is sensitive to these developments.

The goal is to determine how sentiment around US-China tension affects TSMC's stock price.

This report analyzes the link between sentiment about US-China geopolitical tension and TSMC's stock price.

Key Findings:

- Correlation:** A coefficient of -0.21 shows a weak negative correlation between sentiment and stock price.
- Sentiment Distribution:**
 - Negative sentiment: 46%
 - Neutral sentiment: 45%
 - Positive sentiment: 13%
- Stock Price Trend:** TSMC's stock price increased between September 8th and October 10th, despite the dominant negative sentiment, suggesting other factors influence the stock.

While negative sentiment is common, the weak correlation shows that other factors also impact TSMC's stock price during geopolitical tension.



Introduction

The relationship between sentiment analysis and stock price movements is increasingly relevant, particularly concerning geopolitical tensions.

This analysis focuses on Taiwan Semiconductor Manufacturing Company (TSMC), which is significantly influenced by the ongoing geopolitical friction between the US and China.

The purpose is to explore the impact of news sentiment regarding US-China tensions on TSMC's stock price.

The report begins by analyzing sentiment scores and their correlation with TSMC's stock price, followed by a discussion of the implications of these findings.

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Methodology

1

Data Collecting

- Collect geopolitical news from News API and stock price from Yahoo Finance API
- Align news articles and stock price by date for analysis

2

Sentiment Analysis

- Using NLTK VADER to score news sentiment based on article titles

3

Explanatory data analysis

- Inspect and clean data, handle missing values and identify patterns
- Analyze trends in sentiment and stock price fluctuation

4

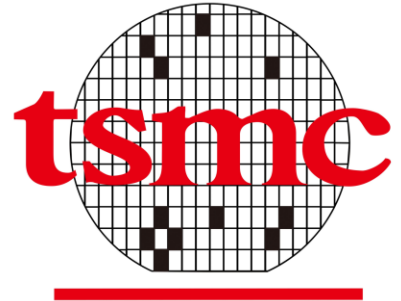
Correlation Analysis

- Measure the relationship between news sentiment and percentage of stock price changes

5

Dashboard and Reporting

- Create an interactive Power BI dashboard to visualize stock price and new sentiment trend
- Generate report with key finding and insight.



Correlation Analysis



Correlation Analysis

Correlation Analysis

Before diving into regression models, you can first check the correlation between sentiment scores and stock price changes. This can give you an idea of whether there's any linear relationship.

```
# Correlation between sentiment and stock price change
correlation = price_sentiment['Price_Change'].corr(price_sentiment['sentiment'])
print(f"Correlation between price change and sentiment: {correlation}")
```

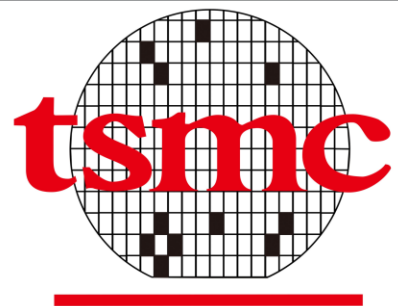
Python

```
Correlation between price change and sentiment: -0.2105813541611019
```

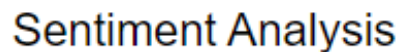
The current correlation coefficient is -0.21, indicating a weak negative correlation between the sentiment score and stock price.

This indicates that the stock price tends to rise as the sentiment score decreases. However, the weak correlation suggests that other factors may also significantly impact stock prices

This tells us that the Geopolitical is down. news does directly cause the TSMC stock price to go up or



Sentiment Analysis



Date _____

9/10/2024

10/8/2024

Category

All

82

Number of Articles

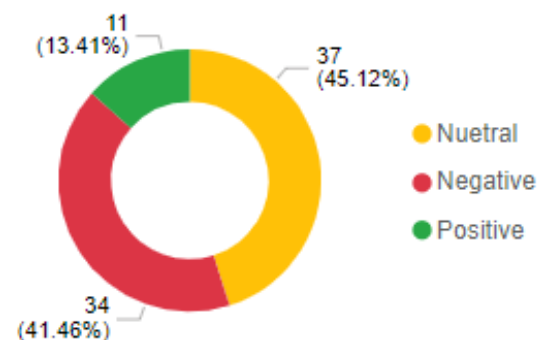
-0.12

Average Sentiment Sc...

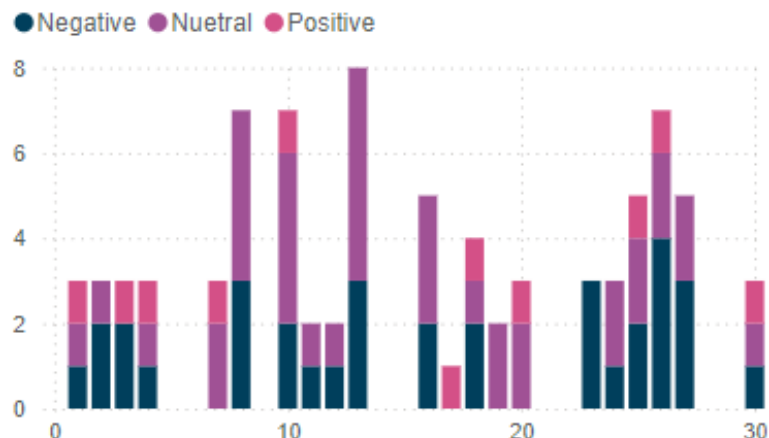
Filters

Month	Day	Article Title	Sentiment
September	10	How Saudi Arabia's ruler used chaos in the Middle East to get what he wants from the US	Negative
September	10	Kishore Mahbubani on the US-China rivalry, Asian security risks, and more	Positive
September	10	Resetting US-China Economic Relations	Nuetral
September	10	Senior China, US Military Officials Hold 'In-depth' Talks	Nuetral
September	10	Typhon Missile Deployment is Part of US Plans to Maintain 'Primacy Over the Planet'	Nuetral
September	10	US Military Warns Beijing Against 'Dangerous' South China Sea Moves In Talks	Negative
September	10	US to sanction Iran over alleged missile shipments	Nuetral
September	11	China-Africa Summit Enhances Relations to the Level of "Strategic Partnership"	Nuetral

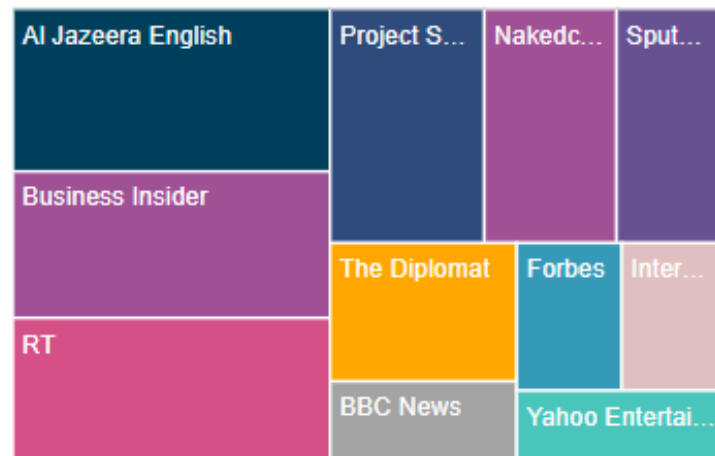
Overall Sentiment Categories



Sentiment Category By Days



Top 10 Source



Popular Key Words





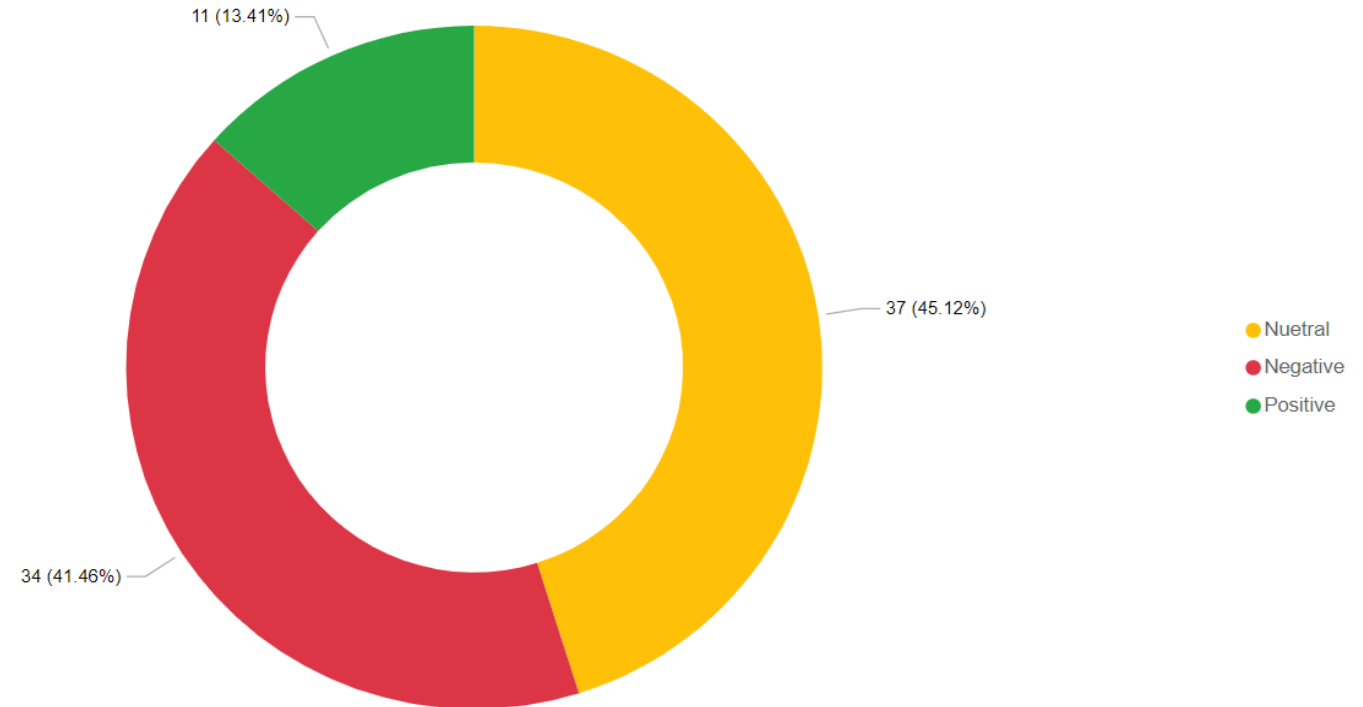
Overall Sentiment Categories

Negative sentiment is the largest sentiment category with 46% followed by neutral at 45% and then positive at 13%

Nearly half of the articles are neutral, This means that many people are unsure about what will happen next between two countries

Geopolitical tension between China and the US is viewed as negative.

Only 13% of the article have anything positive to say about US-China relationship

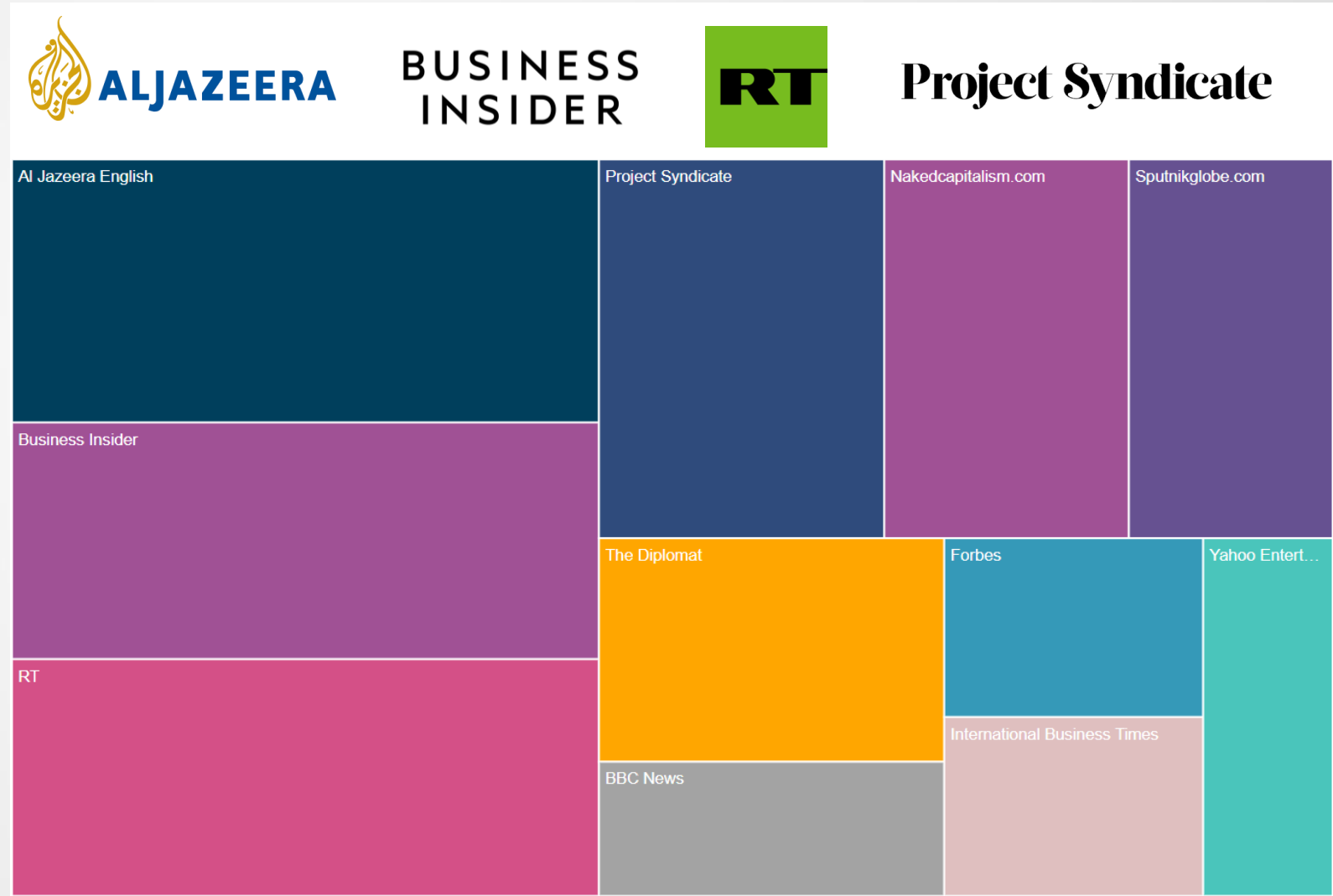


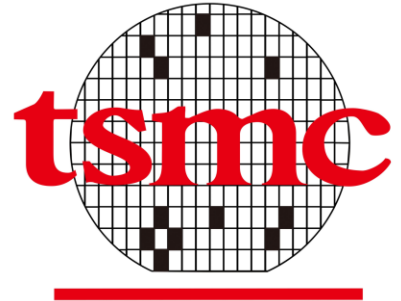
Key Finding

The popular sources for sentiment analysis are Al-Jazeera, followed by Business Insider, RT, Project Syndicate,



Al-Jazeera is a global news network covering various topics internationally, including the US and China Geopolitical tensions.





Stock Price Analysis



Stock Analysis

Date

8/12/2024

10/11/2024

532M

Total Volume

173.19

Average Close Price

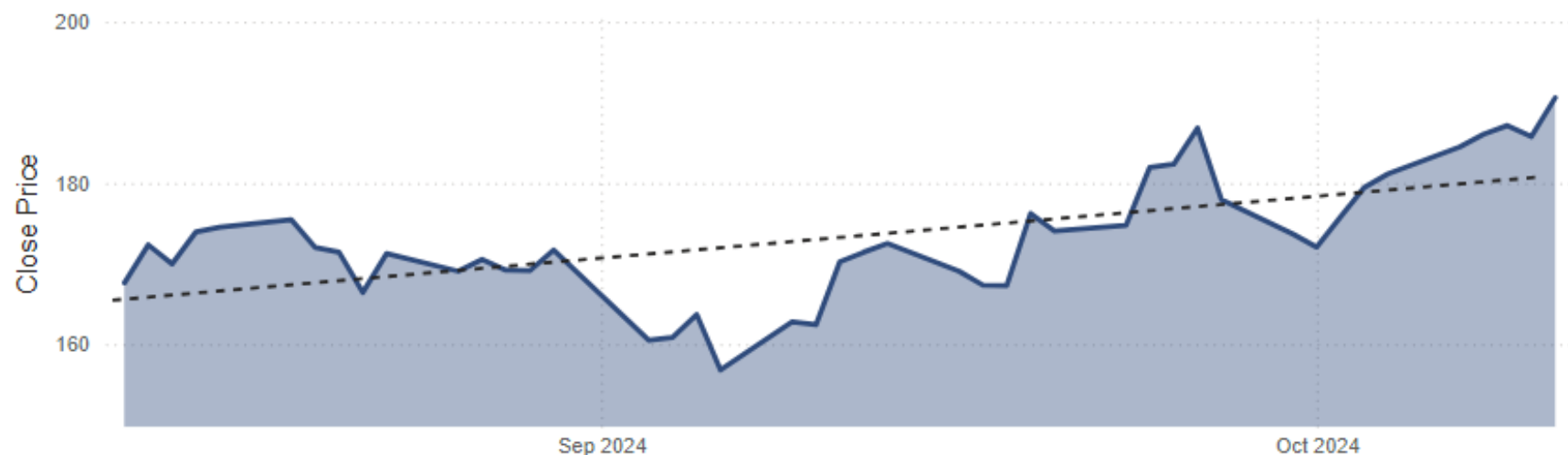
190.60

Max Close Price

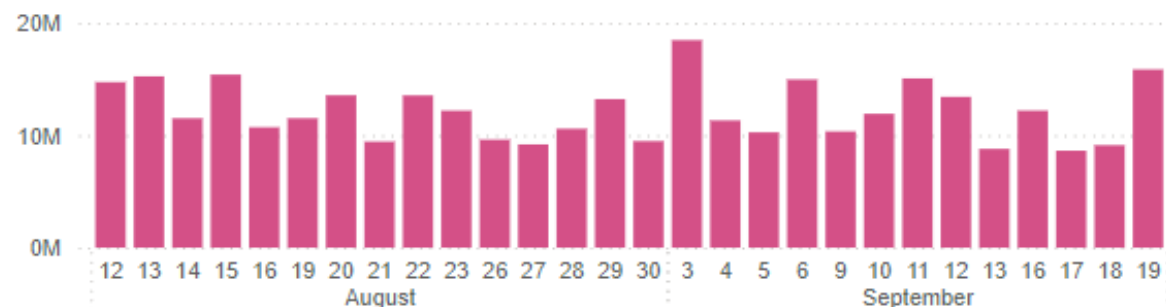
156.82

Minimum Close Price

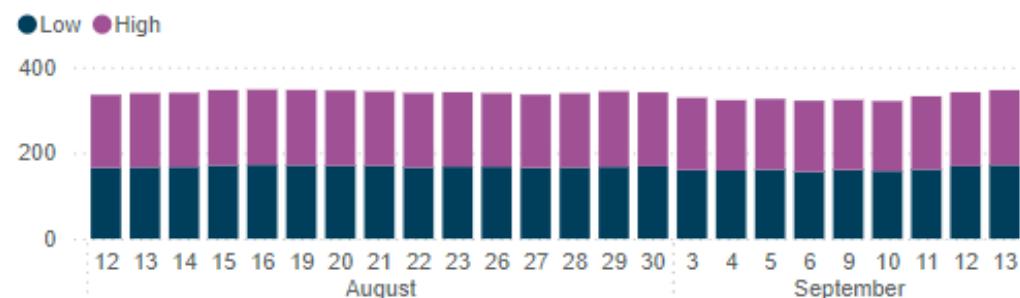
Taiwan Semi Conductor Stock Price Overtime



Daily Trading volume



Daily High and Lows





Stock Price Analysis

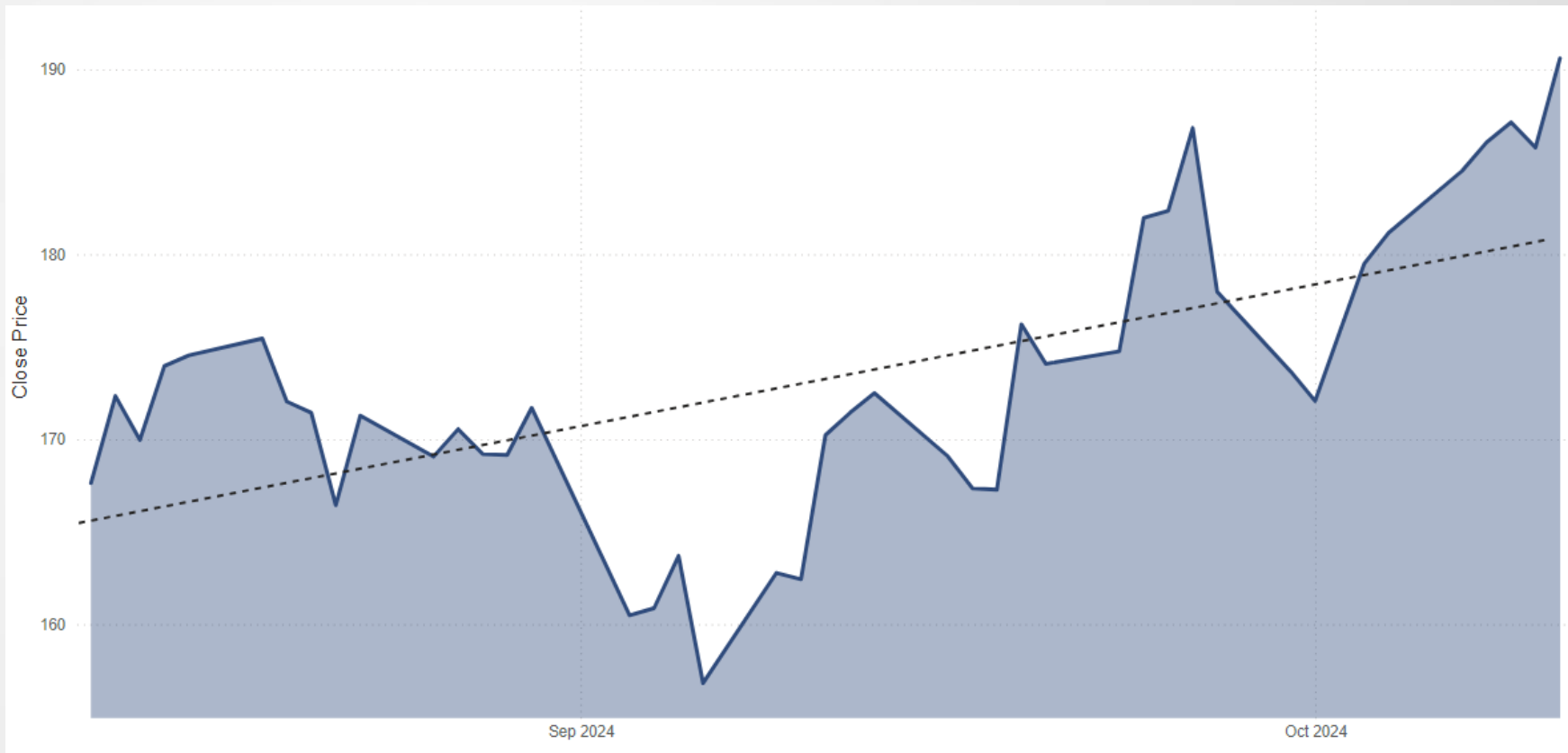


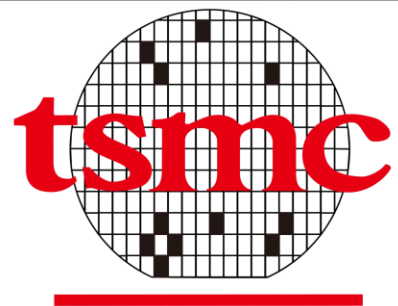
The TSMC Stock Price increased between September 8th - October 10th



TSMC Stock Price increases even though the Negative Geopolitical news sentiment dominates during this time.

It shows that the correlation analysis is true. Secondly, other factors can influence the TSMC stock price.





Stock Price vs Sentiment Analysis



Sentiment vs Stock Price

Category

All

Date

9/10/2024

10/8/2024

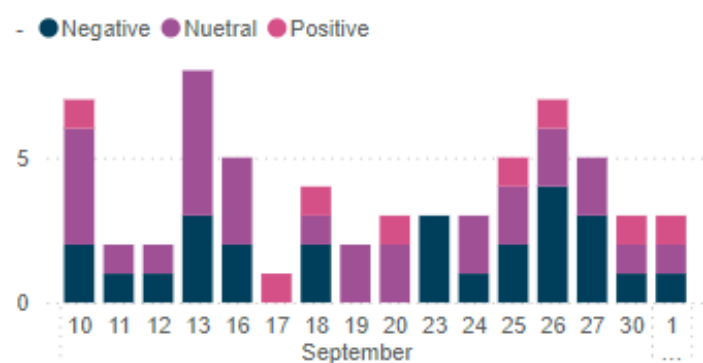
Stock Price Over Time



Average Stock Price in Sentiment Categories



Sentiment Category Over Time



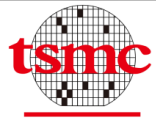
Month	Day	Article Title	Sentiment	Stock Price
September	10	How Saudi Arabia's ruler used chaos in the Middle East to get what he wants from the US	Negative	162.43
September	10	Kishore Mahbubani on the US-China rivalry, Asian security risks, and more	Positive	162.43
September	10	Resetting US-China Economic Relations	Nuetral	162.43
September	10	Senior China, US Military Officials Hold 'In-depth' Talks	Nuetral	162.43
September	10	Typhon Missile Deployment is Part of US Plans to Maintain 'Primacy Over the Planet'	Nuetral	162.43
September	10	US Military Warns Beijing Against 'Dangerous' South China Sea Moves In Talks	Negative	162.43
September	10	US to sanction Iran over alleged missile shipments	Nuetral	162.43
September	11	China-Africa Summit Enhances Relations to the Level of "Strategic Partnership"	Nuetral	170.23
September	11	China-Africa Summit Shines a Spotlight on Eswatini, Taiwan's Lone Partner in Africa	Negative	170.23

176.08

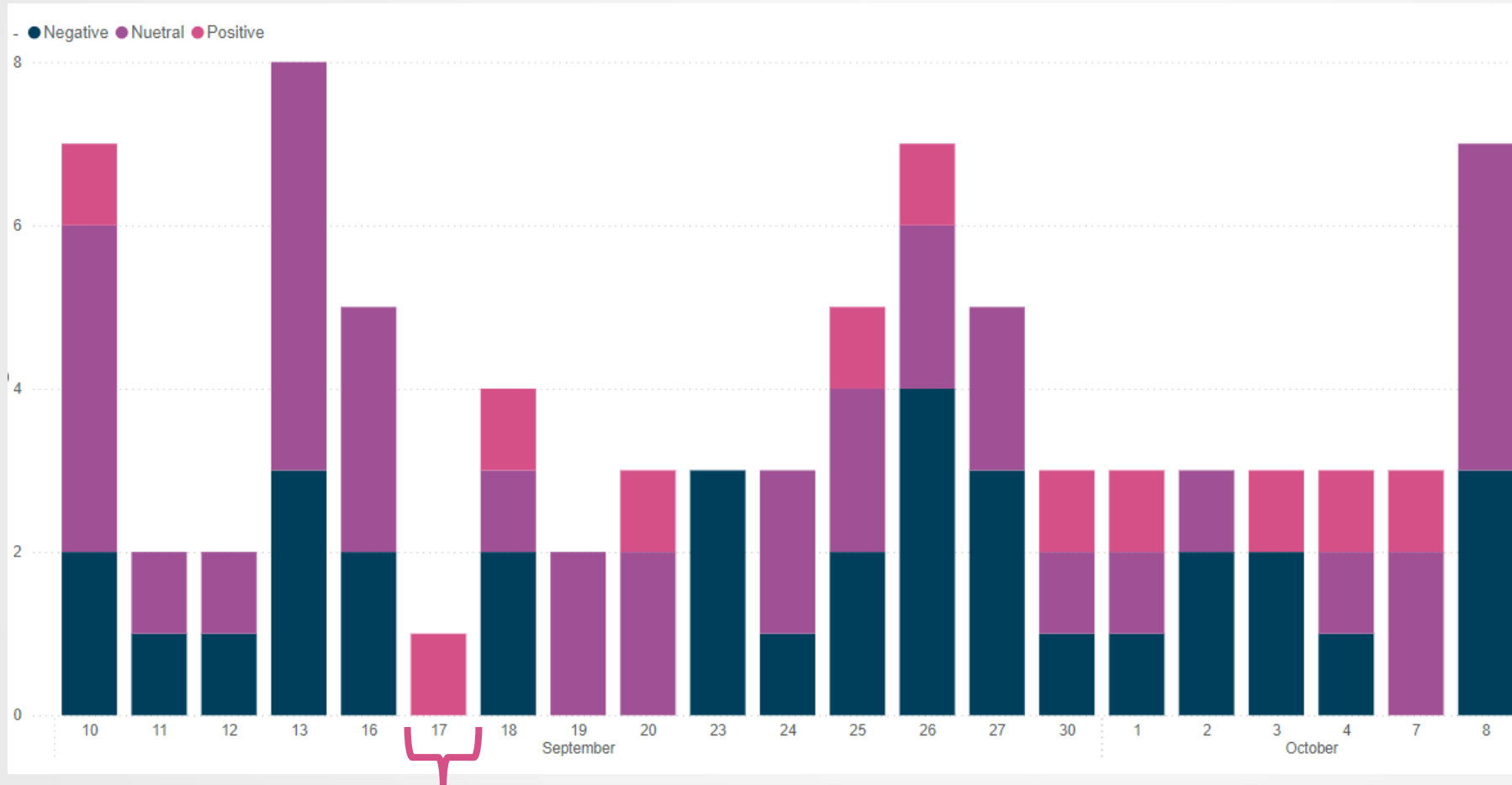
Average of Close

-0.12

Average Sentimen...



Sentiment Category Overtime



There is only one day when positive sentiment dominates.
Title: 'Trump Says You Will Get Along with Russia and China'

Key Findings:

The sentiment category fluctuates over time. Most of the sentiment timelines are negative and neutral

It shows that most people perceive the US and China geopolitical tension as negative and neutral.

US-China tension is often seen as negative due to economic impact, security concerns, ideological differences, and media coverage

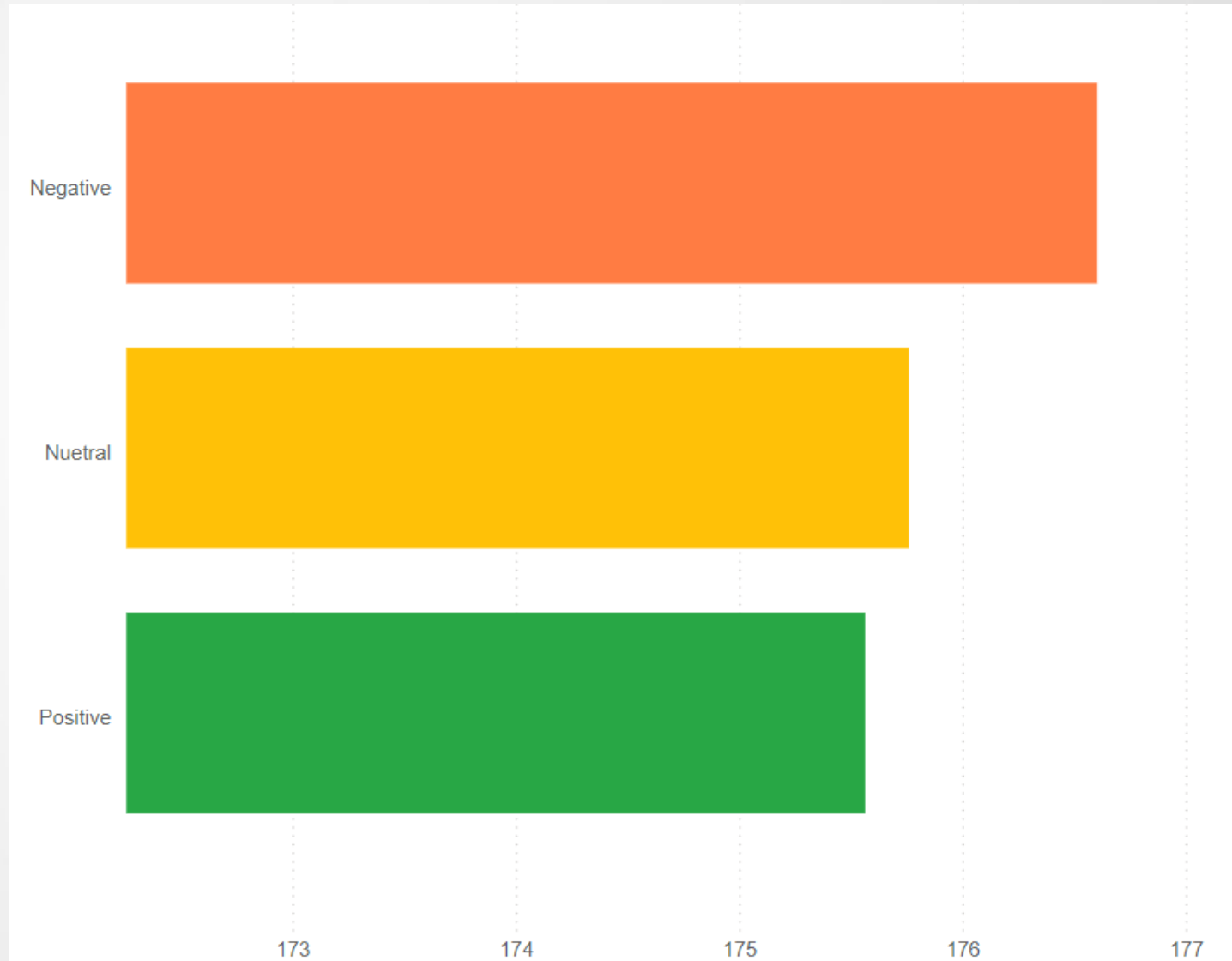


Average Stock Price in Sentiment Category

Negative sentiment shows the highest average stock price compared to other sentiment categories

It shows that US and China Geopolitical tension from media coverage does not necessarily decrease the stock price

Despite the dominance of negative sentiment due to geopolitical tensions, TSMC's stock prices are rising. This reflects the company's strong financial performance, even with unfavorable sentiment.





Discussion

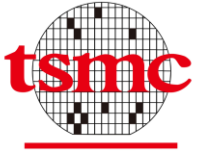
A correlation coefficient of -0.21 indicates a weak negative relationship between geopolitical tension sentiment and stock price.

As the negative sentiment from the geopolitical tensions increases, the stock price increases. However, a weak correlation indicates that the relation is not robust, meaning sentiment is just one of many factors influencing the stock price.

Understanding the relation is important for investors and analysts focusing on TSMC. While sentiment regarding geopolitical issues may influence stock prices to some extent, it highlights the need to consider a broader range of factors including market trend, company performance and global semiconductor demands.

The weak correlation does not imply causation, meaning we cannot conclude that changes in sentiment regarding geopolitical tension directly cause changes in TSMC stock price.

Future studies could benefit from examining the impact of additional factors on TSMC's stock price such as economic indicator, global supply chain dynamics, and the broader semiconductor market context.



Conclusion

Correlation between geopolitical tension sentiment and TSMC stock price shows a weak negative correlation of -0.21, suggesting that while geopolitical sentiment worsens, the stock price rises.

During the period from September to October, the TSMC stock price increased despite 46% of news articles being negative and 45% neutral about US and China geopolitical tension

This suggests that negative sentiment does directly cause the stock to fall. The geopolitical tension is mainly view negatively due to economic, security, and ideological concern

This suggests that negative sentiment does directly cause the stock to fall. The geopolitical tension is mainly view negatively due to economic, security, and ideological concern

Investors and analysts look beyond headlines and consider multiple factors to asses company stock performance accurately.