



Data Analytics Bootcamp Group 1

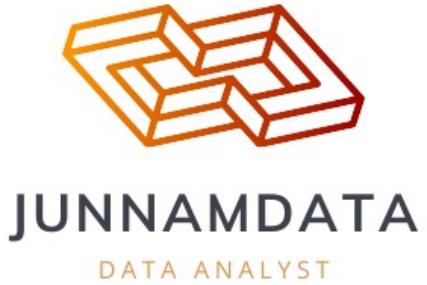
Project 1



Corporate Member

Junnamdata was established circa 2024:

- *Jun Nam (Founder)*
- *Rekha (Chief Data Officer)*
- *Bailey (Senior Data Analyst)*
- *Yau Shu Wong (Data Analyst)*



*"If you are shopping for common stocks,
choose them the way you would buy
groceries, not the way you would buy
perfume."*

Jun

Project Outline

Identify the correlations between various US macroeconomic indicators and US stock prices

- Stock Profits vs Unemployment Rate
- Stock Profits vs Federal Interest Rate
- Stock Profits vs Bond Rate
- Stock Profits vs Real GDP per Capita
- Stock Profits vs CPI

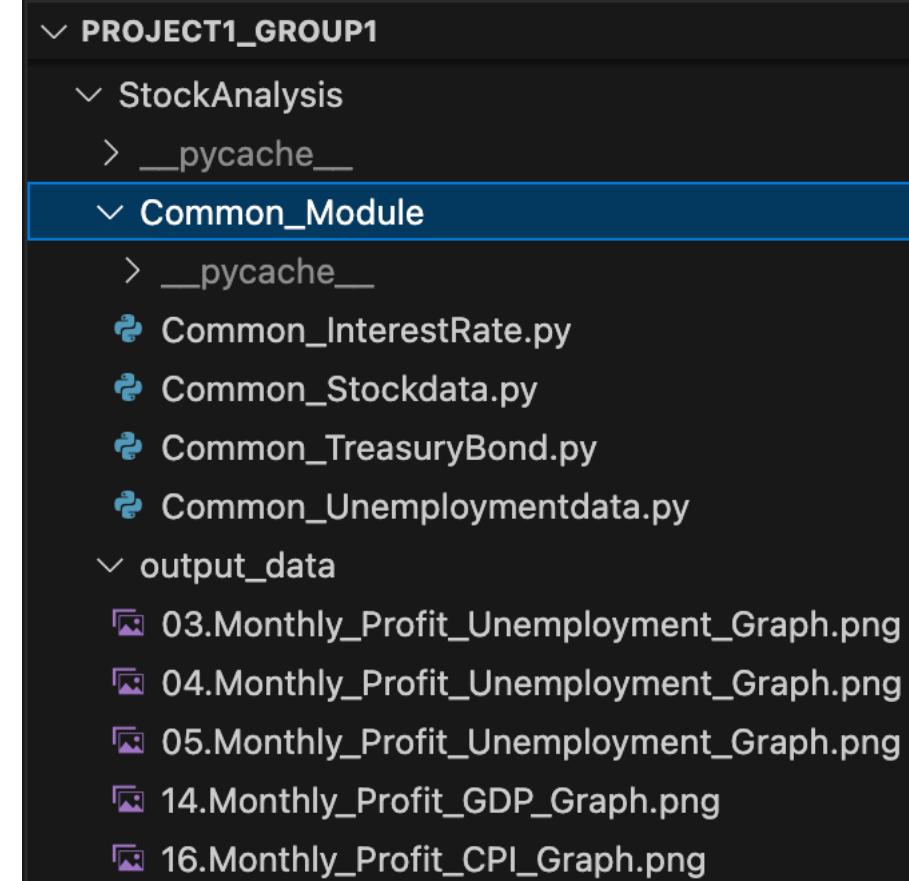


Data Collection, Cleanup, and Exploration Processes

- Common module created to standardise data retrieving process
- Selected time range ranges from 2010 to 2019 (pre-covid)
- In general, the API data are of high quality. Applied ‘dropna’ to remove empty rows.
- Applied exception handling for potential errors.

```
# Data Cleaning – Drop all rows with missing information
stock_info_df = stock_info_df.dropna(how='any')
```

```
except KeyError as e:
    print(f"Key error: {e} - Check Response dictionary or data keys.")
    return None
except ValueError as e:
    print(f"Value error: {e} - Check Data types and conversions.")
    return None
except Exception as e:
    print(f"An unexpected error occurred: {e}")
    return None
```

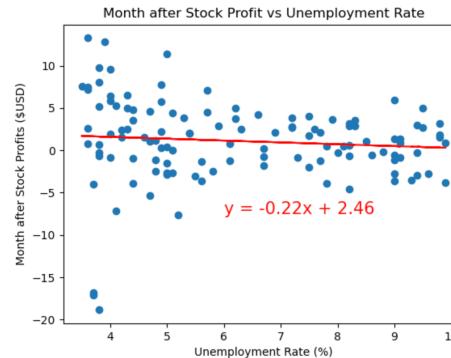
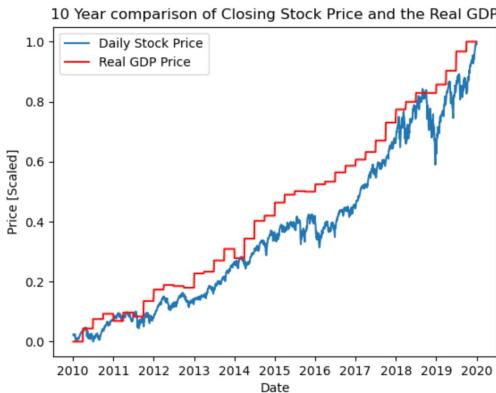


API URLs

- BLS (U.S Bureau of Labor Statistics) API: <https://www.bls.gov/developers/>
- FRED (economic) API : <https://fred.stlouisfed.org/docs/api/fred/>
- Alphavantage API : <https://www.alphavantage.co/documentation/>

Analysis Approach

- Create panda Data Frames, merge data frames
- Compare the stock profits/price against macro economic indices using matplotlib
 - Line Plot
 - Bar Chart
 - Scatter plot
- Statistical analysis
 - Line Regression
 - Pearson Correlation

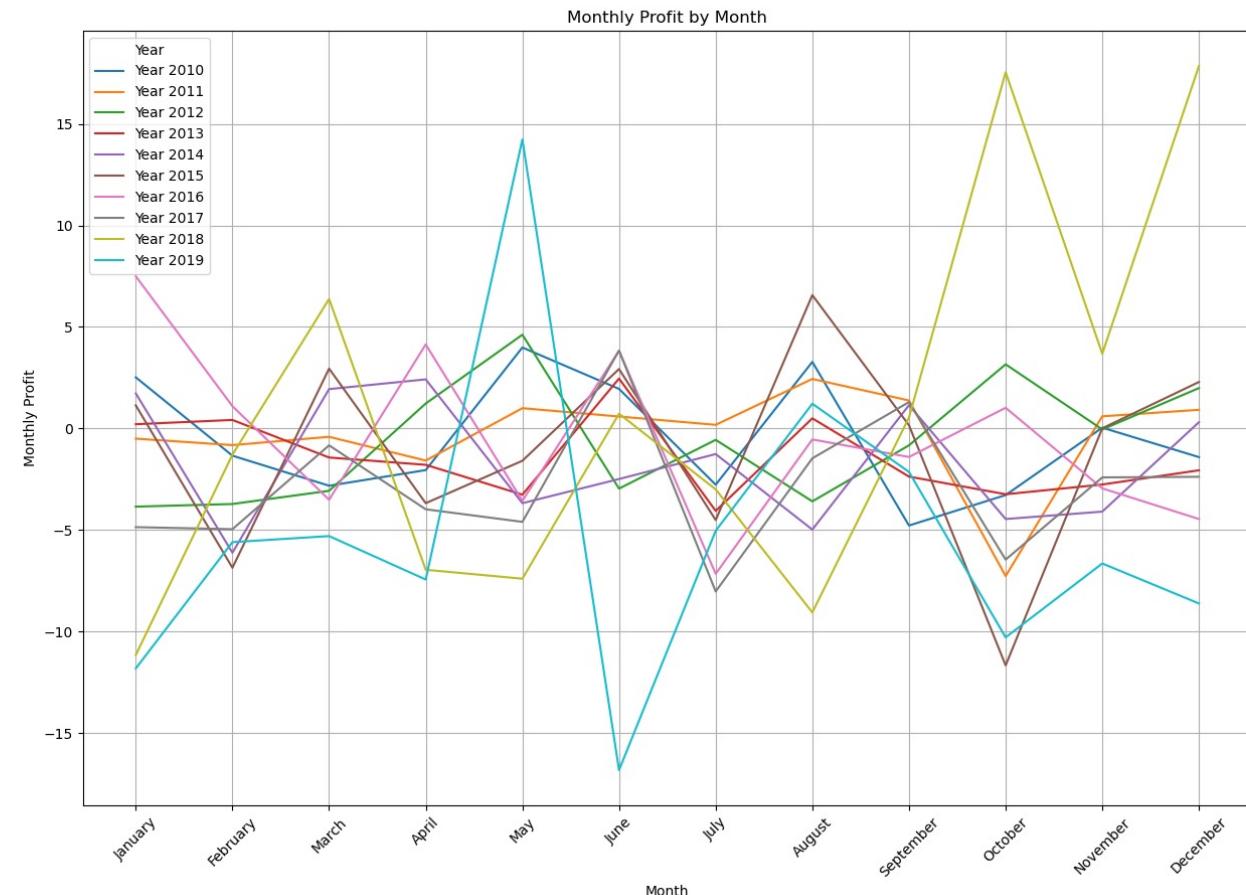
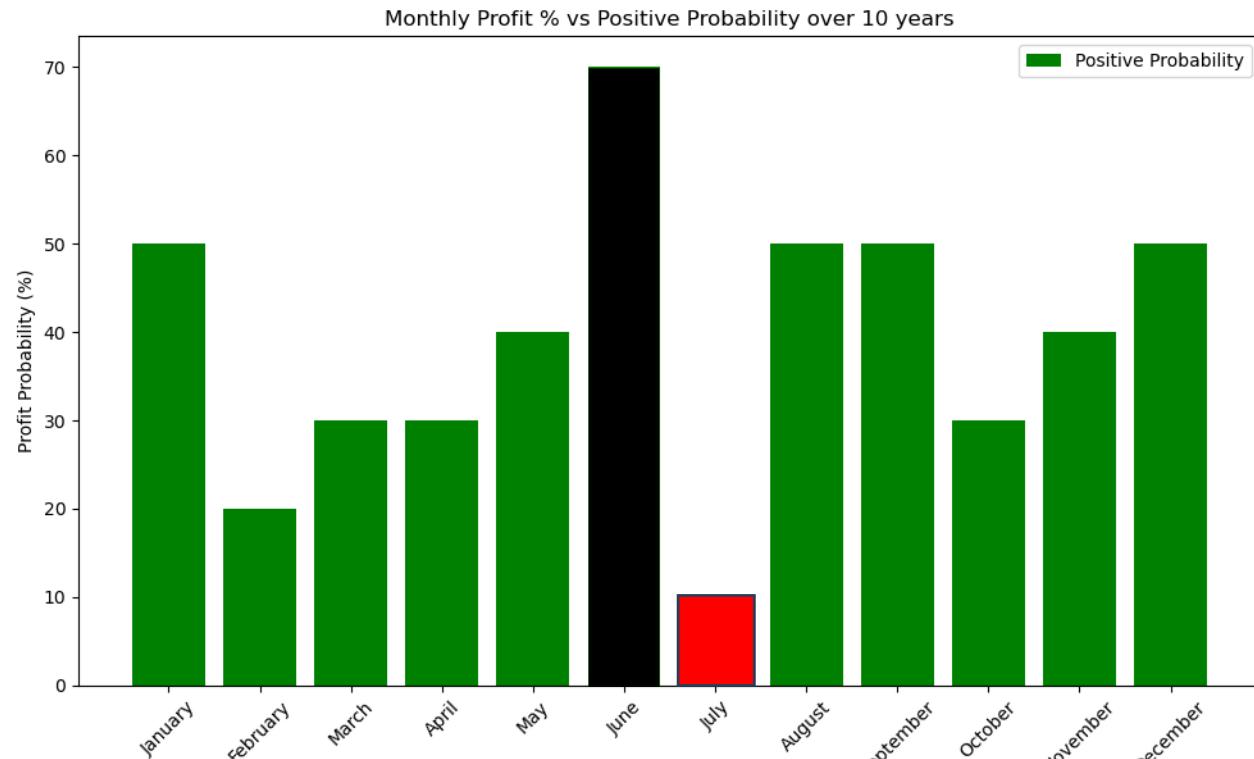


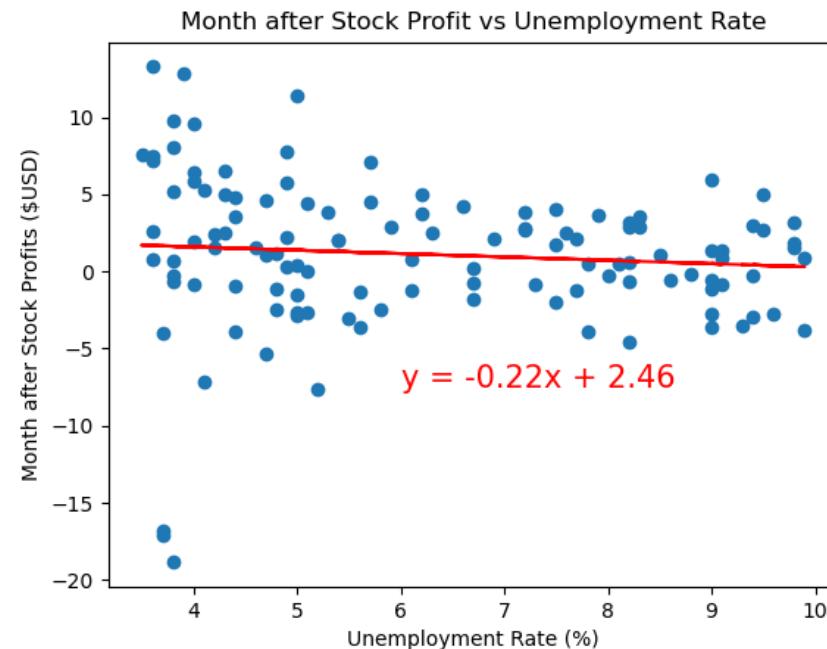
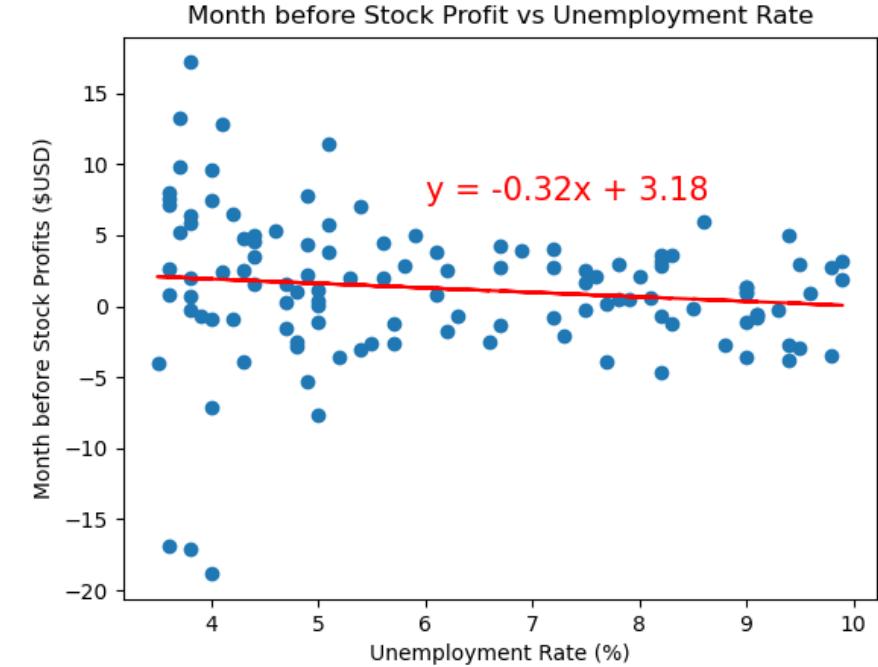
The r-squared is: 0.02
The p-value is 0.17
The correlation between both factors is -0.13

Results

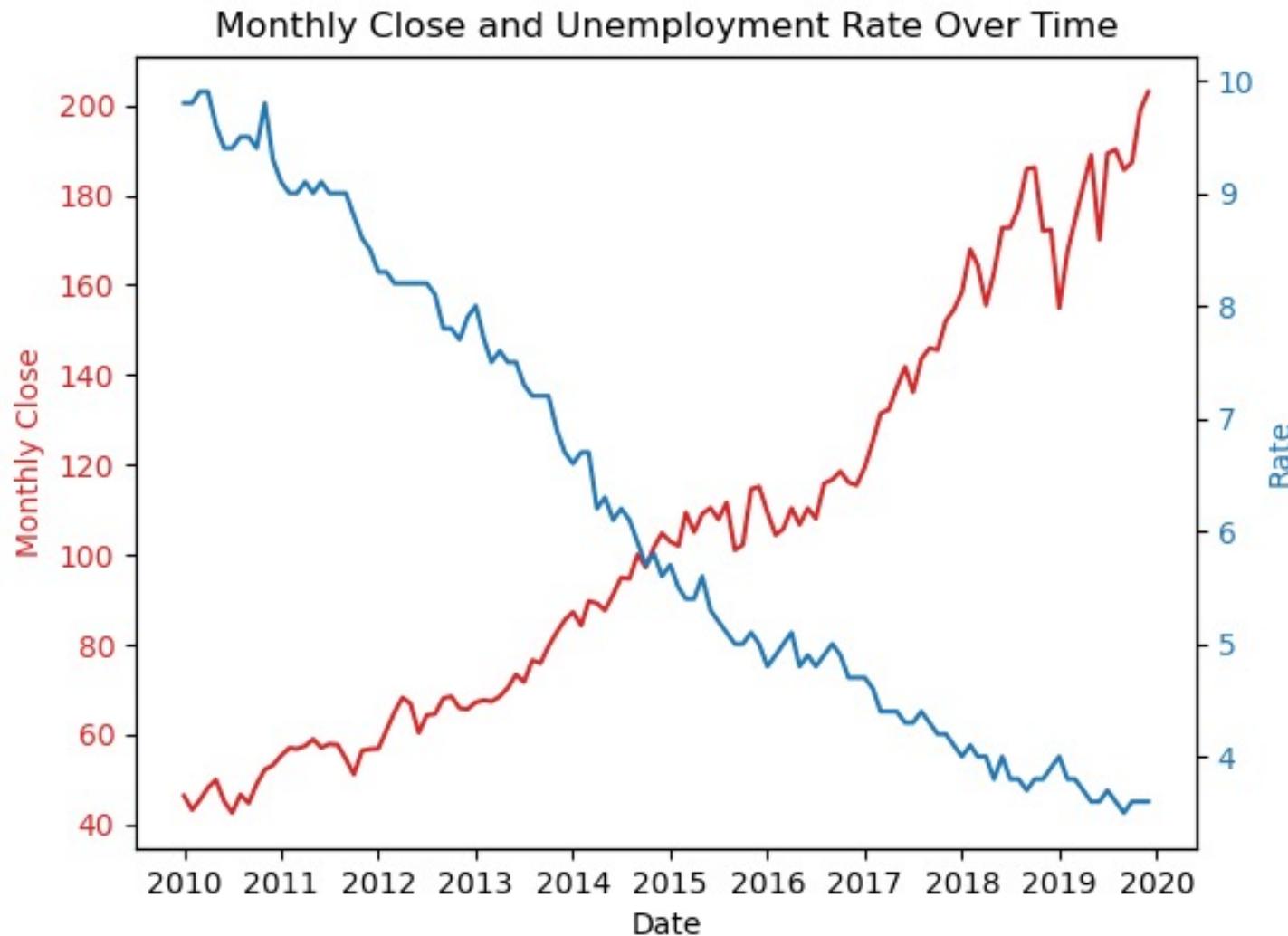


- E.g., Purchasing stock in end of May, will yield a probability of the stock profit at the end of June of ~70%.
- Do not recommend to trade Stock in July as this is the worst performing month on average over 10-year.





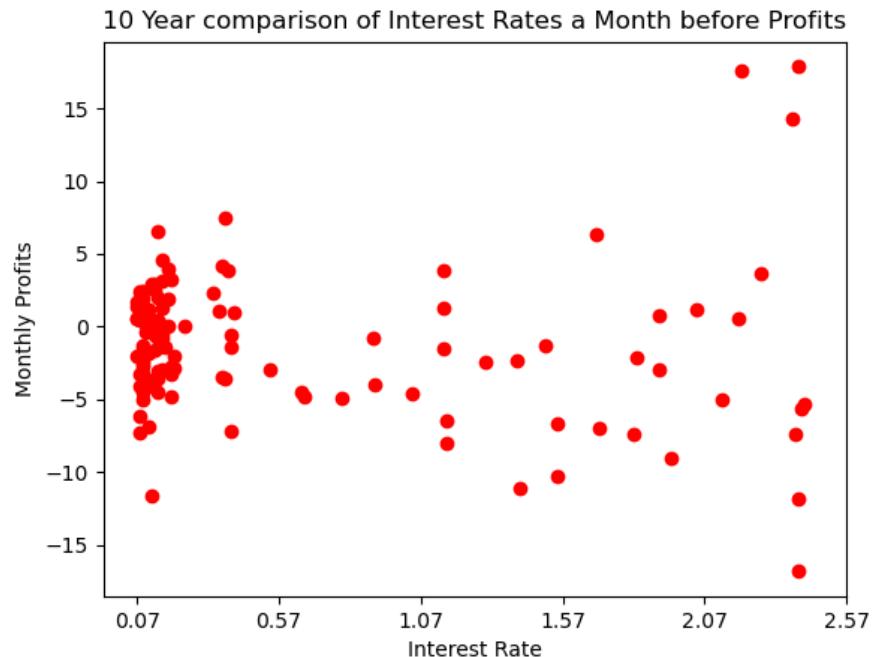
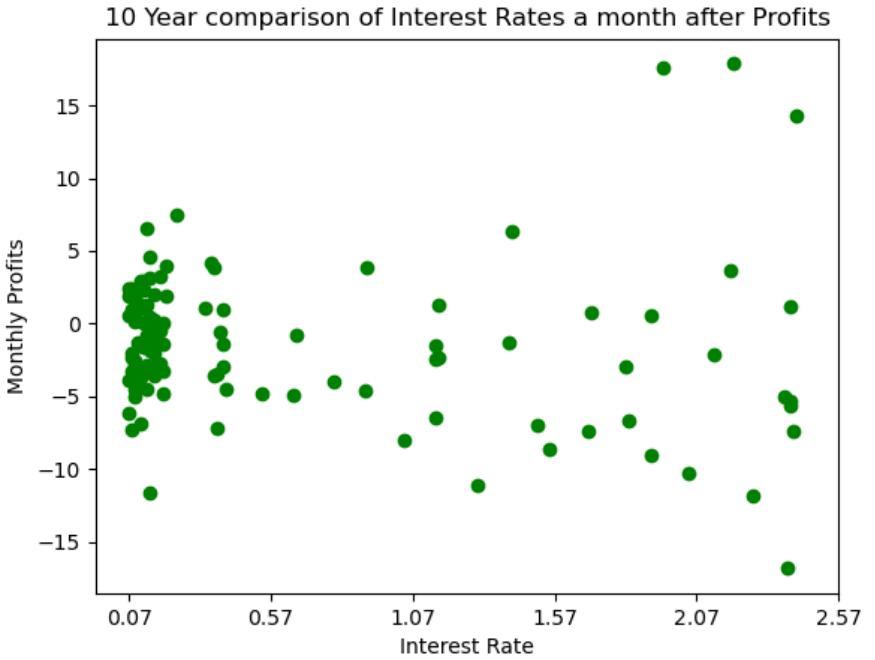
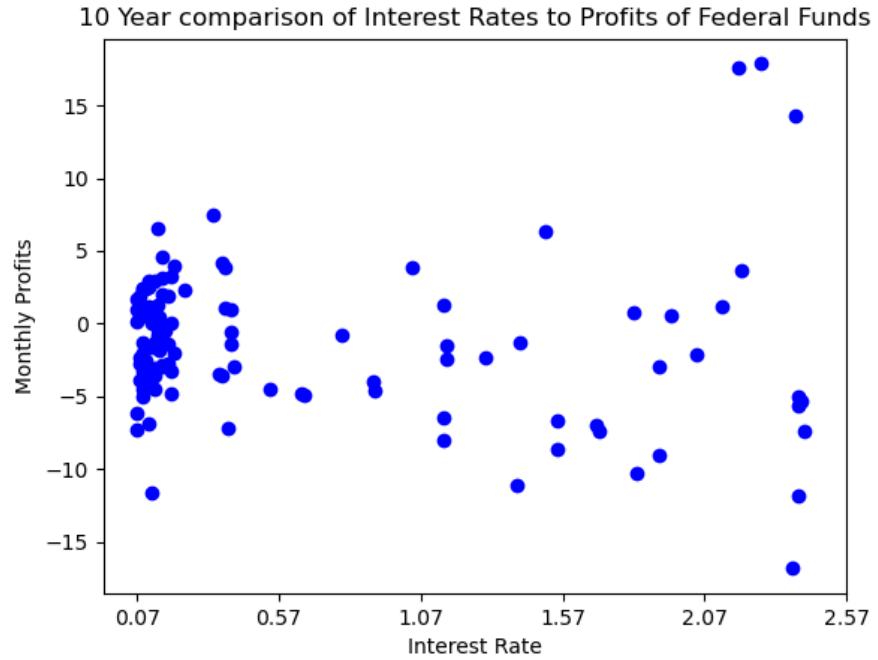
- The monthly stock profit does not appear to show any correlation with the unemployment rate.



- The stock closing price and unemployment rate is showing an opposite trend over time.

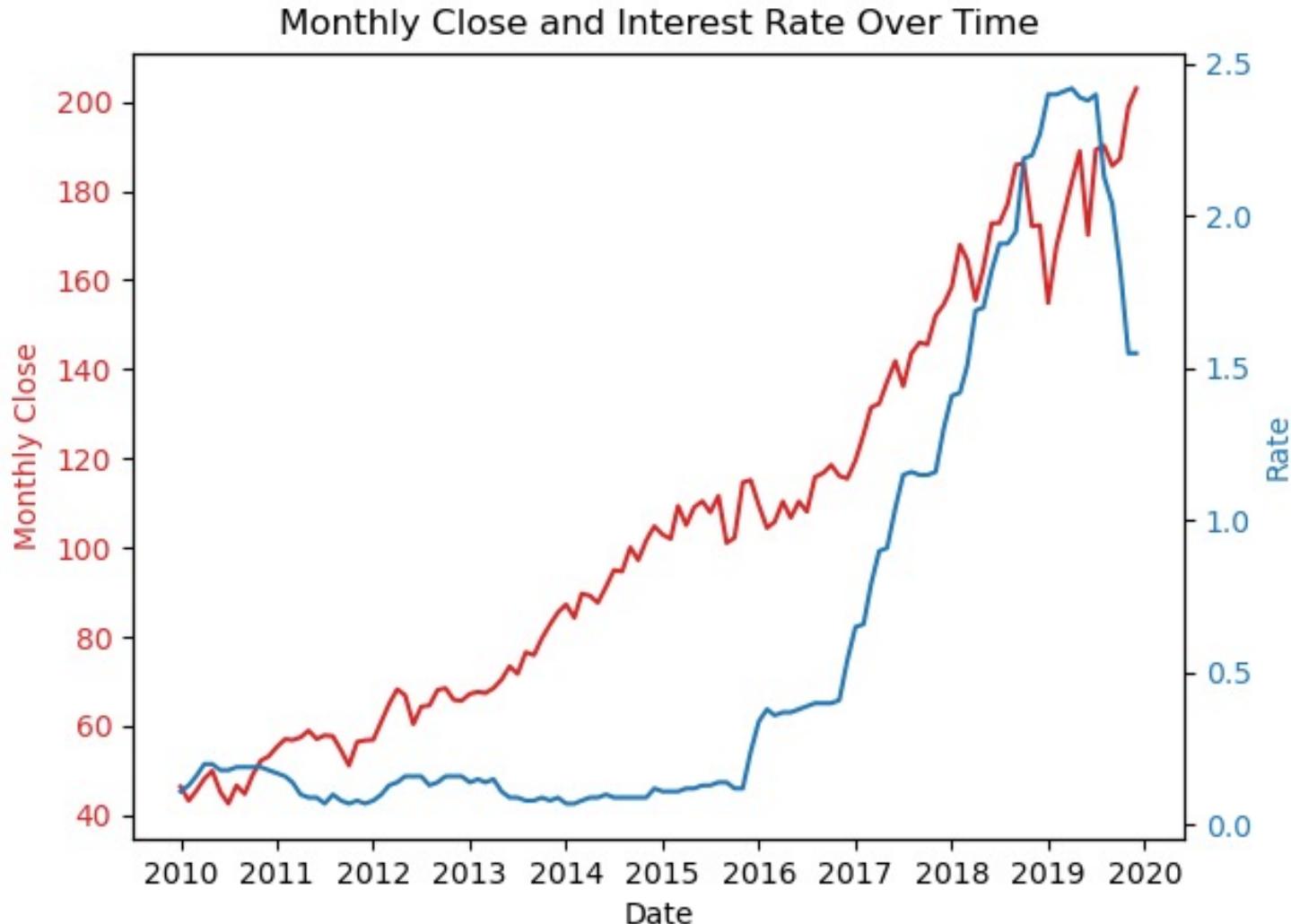


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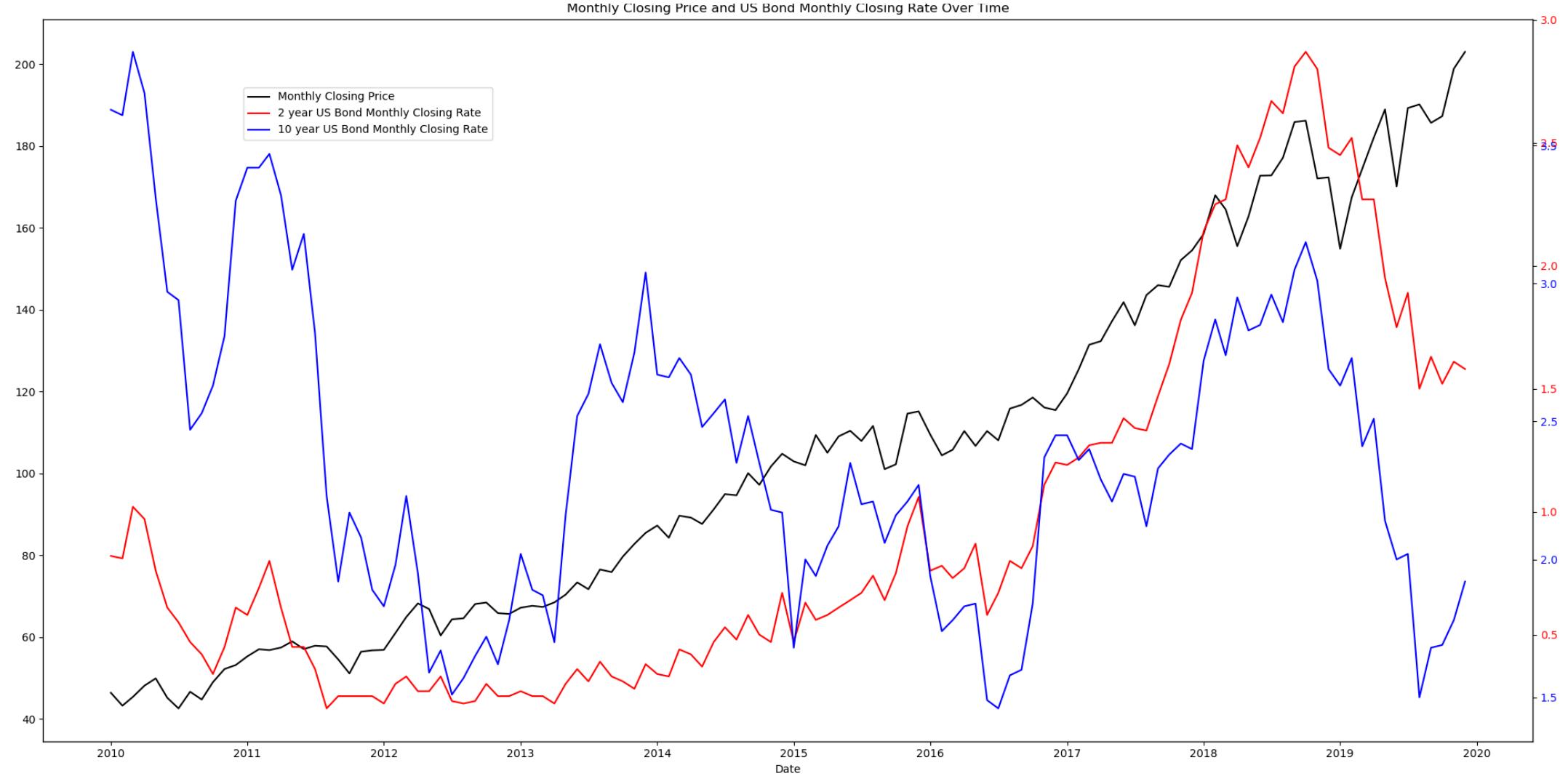


- It does appear to have any correlation between the monthly stock profit and Federal Interest Rates.





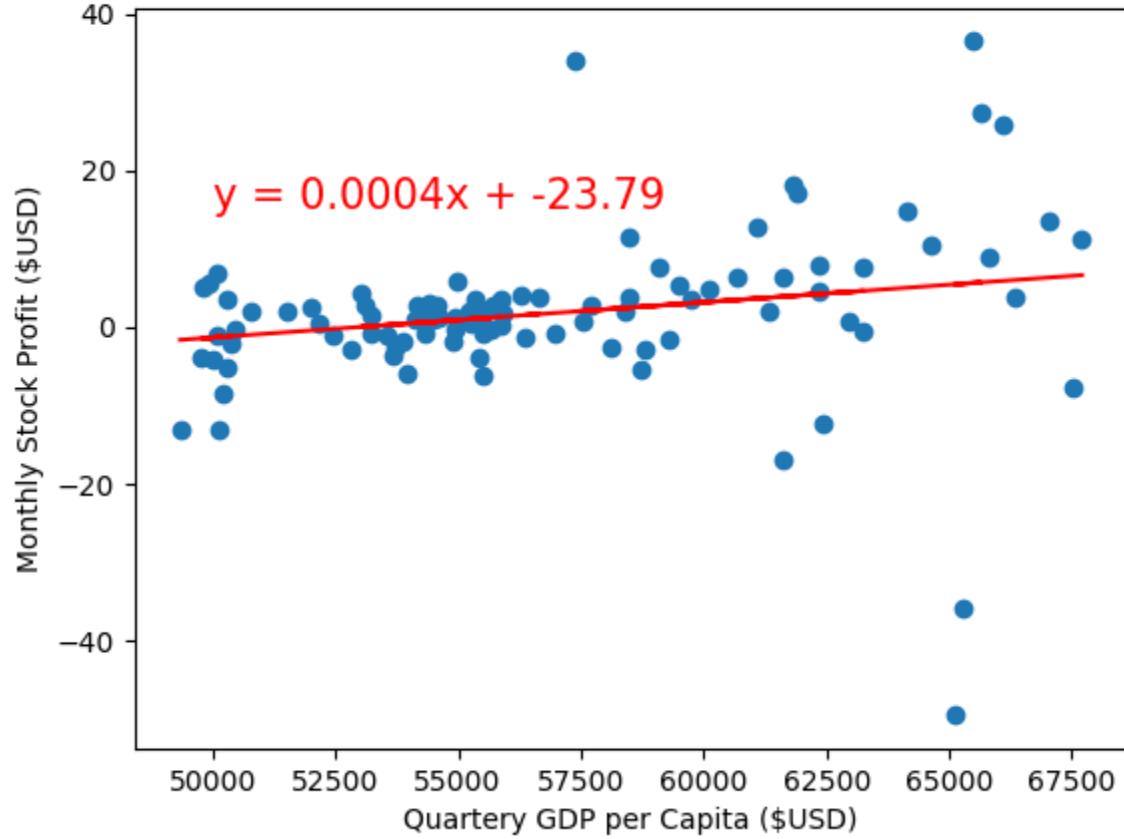
- The monthly closing price vs interest rate over time appears to differ between pre & post 2016.



- Stock price in 2-years US Treasury Bond Rate is showing similar trend over time. However, there are no correlation between the stock price and the 10-year Treasury Bond Rate.

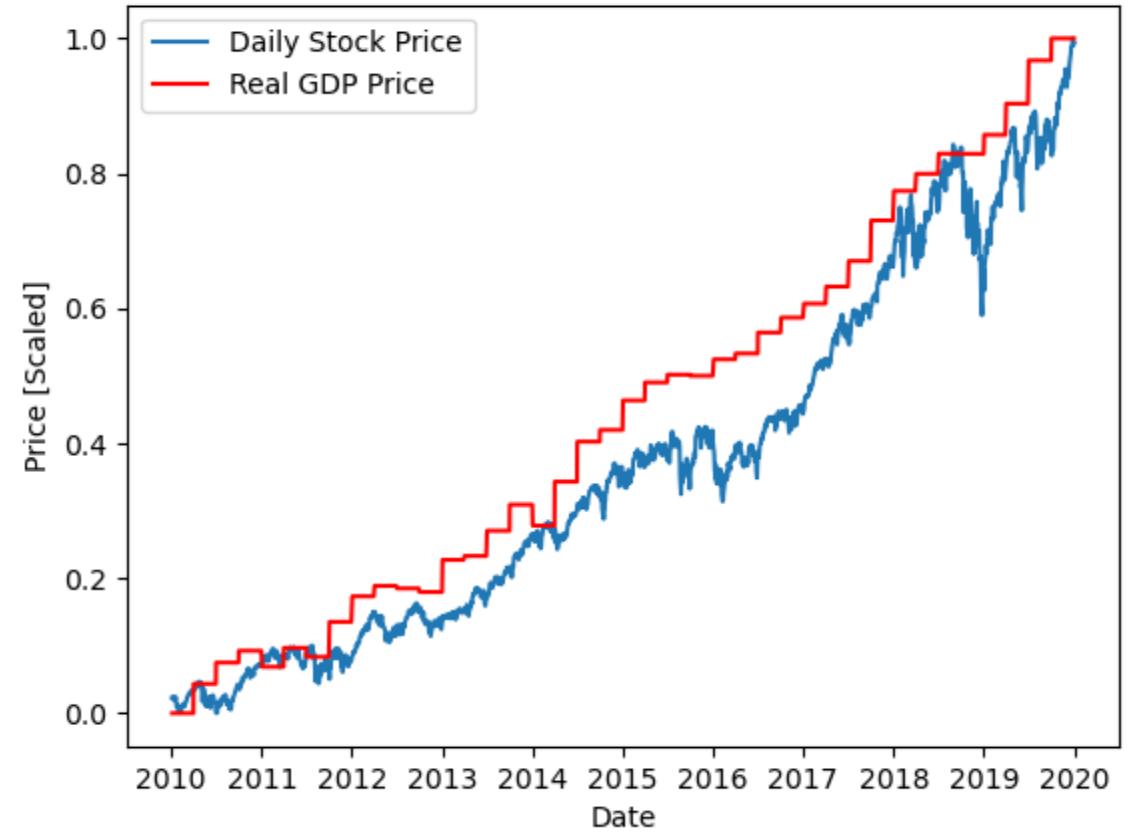


Monthly Stock Profit vs GDP per Capita



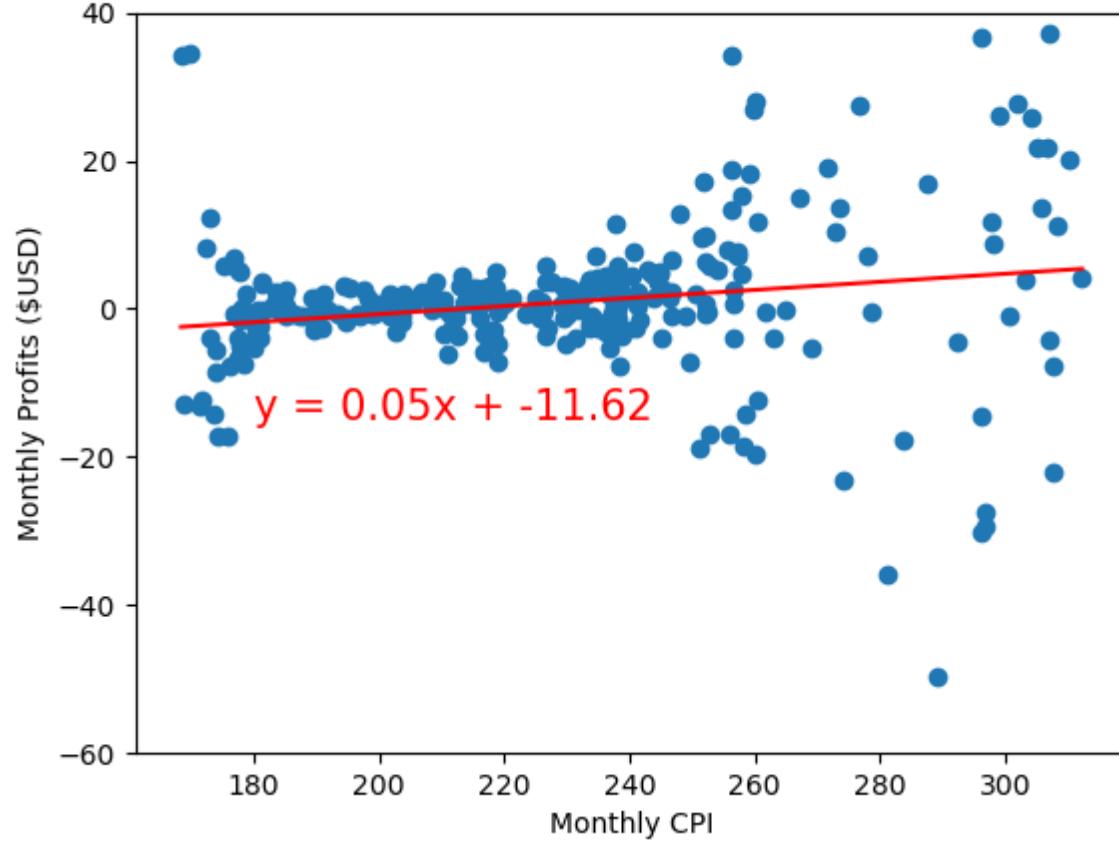
- The monthly stock profit does not appear to show any correlation with the Quarterly GDP per Capita.

10 Year comparison of Closing Stock Price and the Real GDP



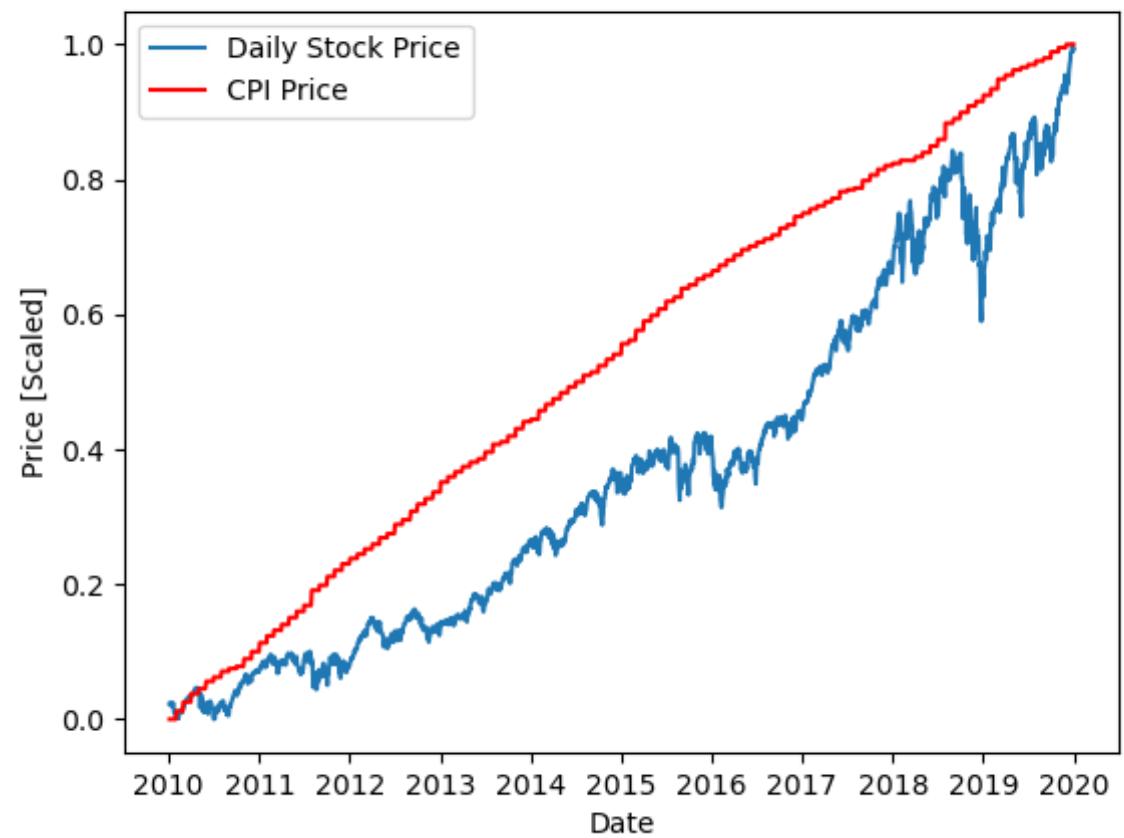
- The closing stock price vs GDP has a correlation value of 0.99.

Stock Profits vs CPI



- The monthly stock profit does not appear to show any correlation with the CPI.

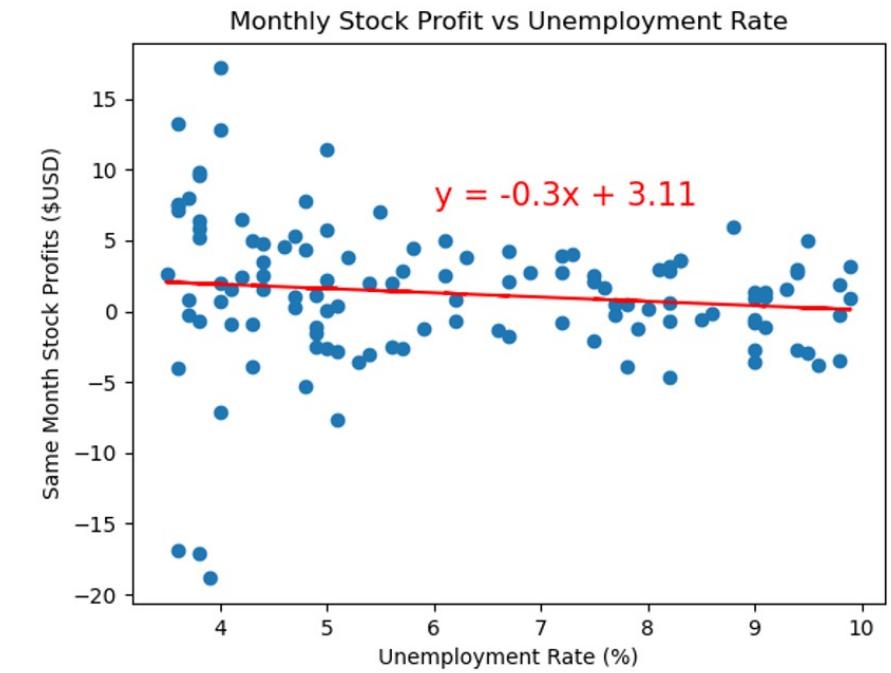
10 Year comparison of Closing Stock Price and the US CPI



- The closing stock price vs CPI has a correlation value of 0.97.

Next Step

- Develop a Machine Learning classification algorithm to plot boundaries to predict future possible outcome:
 - Kernel Trick SVM
 - K-Nearest Neighbour model
 - Naive Bayes model



Thank You