RELATIVE STRENGTH COMPARISON IN THE STOCK MARKET

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Team 103 – Data Analytics with Excel and Python

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Tableu Dashboard

Presentation Video

Overview

In the past 6 months, the stock markets have been in a strong decline. Stocks like Facebook, Snapchat, Netflix, and Coinbase suffered 50-90% losses from their all-time highs while stocks like Apple have experienced a 15% loss and AT&T experienced a 10% gain compared to the S&P 500 Index Fund which lost 17% in value. We want to find out which stocks have strong relative strength (Showing strong investor interest) compared to the S&P 500 Index.

Since the beginning of the year 2022, the overall markets have been impacted by politics, wars, and economic events. Using the data, we gathered and wanted to find out which stocks are the safest to invest into. We would accomplish this by looking at the top 3 performing sectors, then picking the top 3 stocks within each sector and comparing relative strength to the overall market.

There has been a huge influx of new investors wanting to put their capital into the stock market. With this said, new investors are not aware of how the stock market works and with the current state of the stock markets they may experience losses, which will then lead them to lose investor confidence. This would make them find other safer options like bonds, commodities, insurance policies or real-estate. Investor confidence is important because if they were to take out their investments from the stock market, it would lead to bigger losses in the overall economy. New investors, especially, would probably not even want to invest into anything else due to huge losses.

Goals

1. *Find stock data from online sources and make it useable to do exploratory analysis.*
2. *Sort and analyze the given data to find safe stocks using Relative Strength Comparison*
3. *Create a visualization to represent the data and to determine its trend.*

4. *Present the results to investors so they can make an educated guess on what stocks to buy and avoid.*
5. *Answer questions or take recommendations from investors and apply it to our analysis.*

Data Analysis & Computation

Data Sources

Our data came from two data sources: Wikipedia and Yahoo Finance.

Wikipedia provides a list of companies and their tickers that are included in the S&P 500.

Source: https://www.wikipedia.com

Direct Link: https://en.wikipedia.org/wiki/List_of_S%26P_500_companies

Yahoo Finance gives us 6 months of historical performance data of stocks including Open, High, Low, Close and Adjusted Close.

Source: https://www.finance.yahoo.com

Python Library: yfinance

Library Documentation: https://pypi.org/project/yfinance/

Data Wrangling and Cleaning

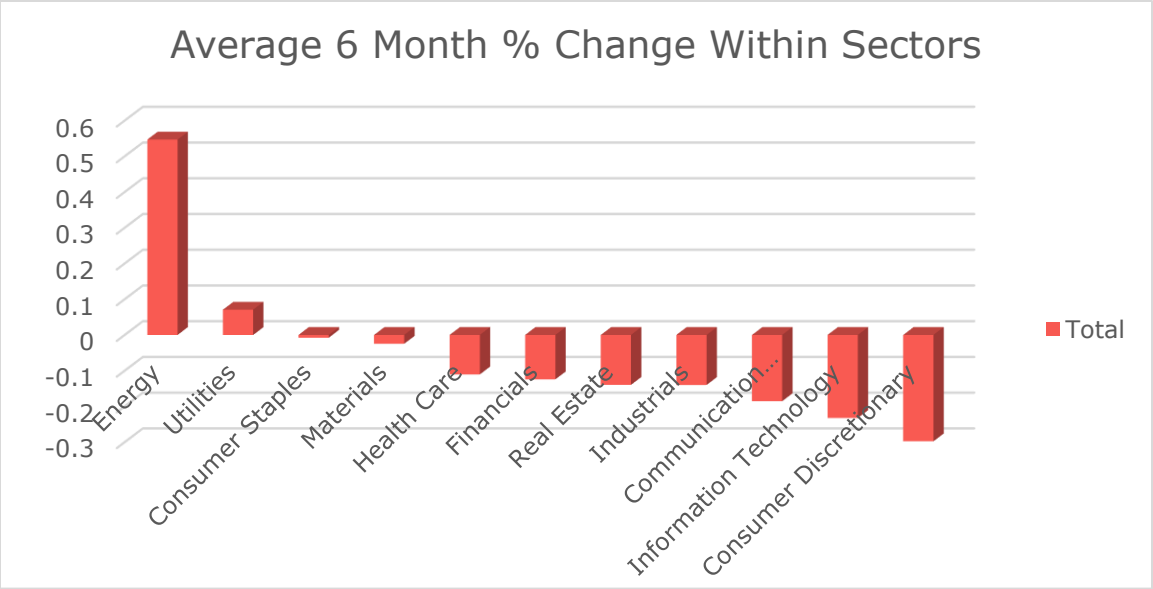
We decided to use our Python skills to get data from Yahoo Finance. Reason being is because it would've taken us a very long time to get data on all the stocks

in the S&P 500. By using Python, we were able to speed up the process drastically. First, we loaded the YFinance, Pandas and the URLLIB library. We then used URLLIB to get the tickers from Wikipedia. The tickers were then saved as a variable, so we can use it with the YFinance
library. Next, we used the variable we saved earlier to get six months of data on the stocks in the S&P500 in monthly intervals.

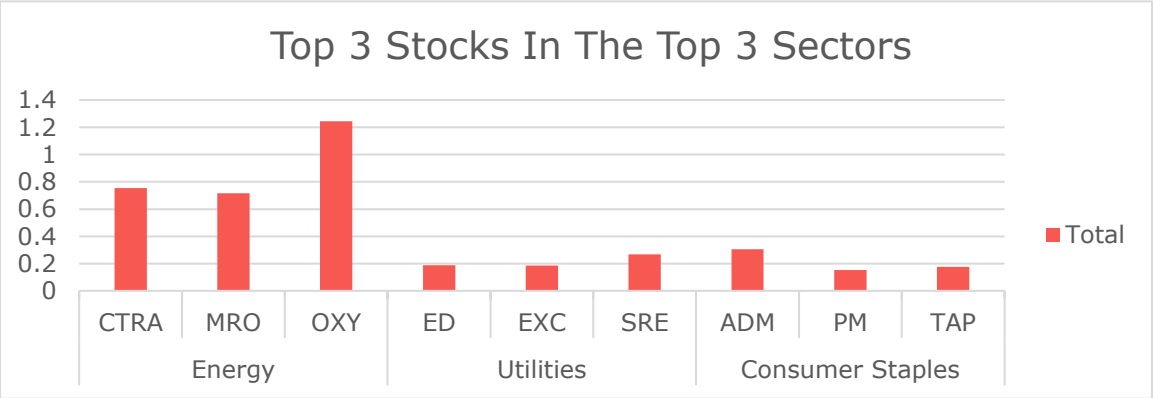
The result came in an unusable dataset, so we had to transpose the rows and columns. These were then saved into a CSV file. Furthermore, we opened the CSV file in Excel, renamed the columns and changed the data types. Such as the dates being changed from a string format to a date format, and we also shortened the decimal places in the stock prices to two places. Finally, we filtered everything out but the Adjusted Close price.

After we finalized filtering, the dataset was ready for visualizations and EDA. We took this dataset into Excel, where we used dataset to create bar graphs and pivot charts for better understanding. After completing previous step, we uploaded our dataset into Tableau Public. Here we created interactive charts for our in-depth analysis.

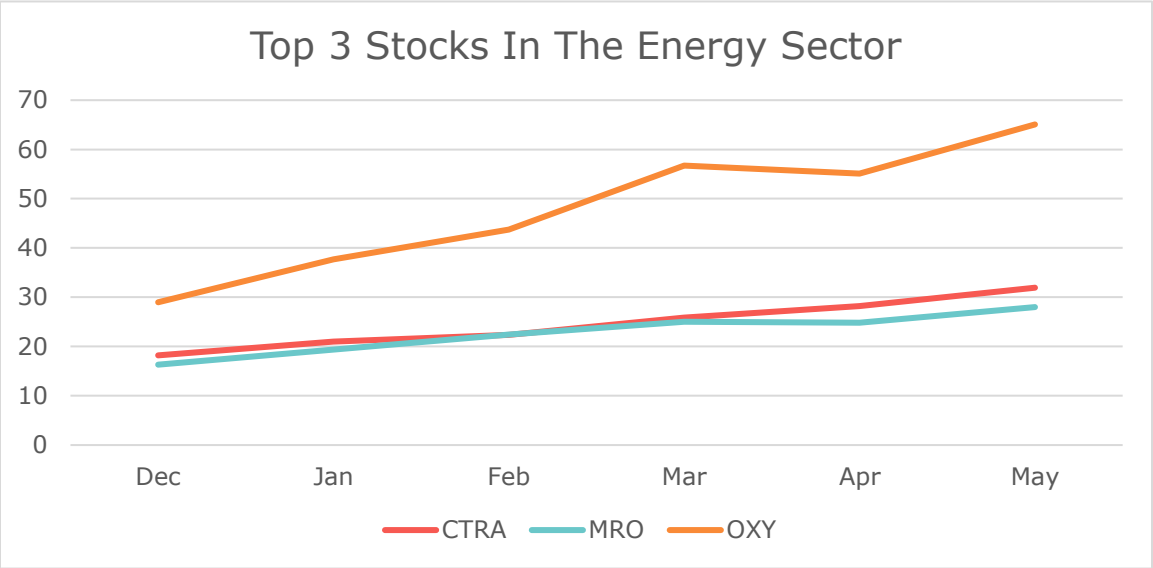
Exploratory Data Analysis



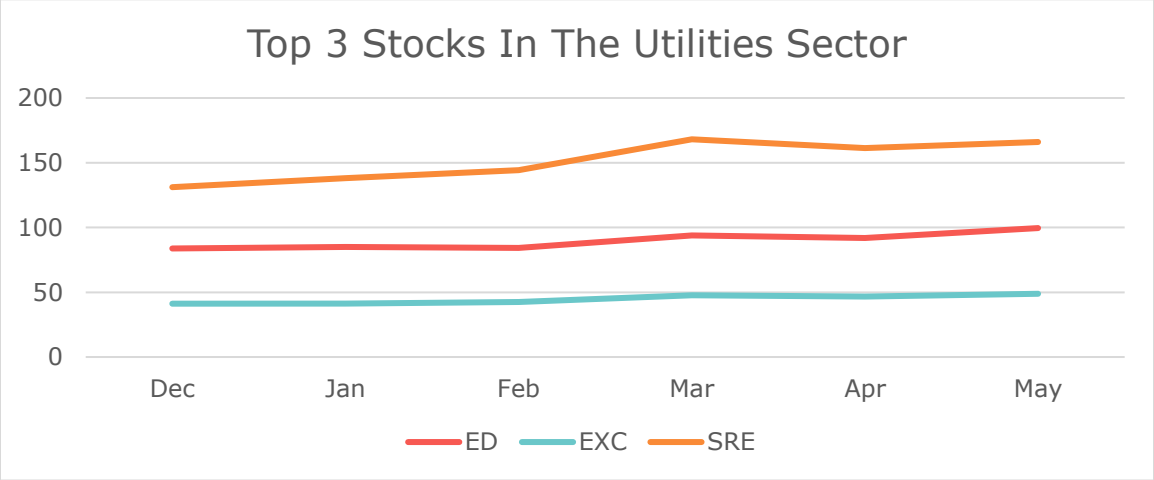
Using this chart, we came to conclusion that the top 3 sectors were Energy, Utilities and Consumer Staples. Energy and Utilities were the only sectors with a positive return.



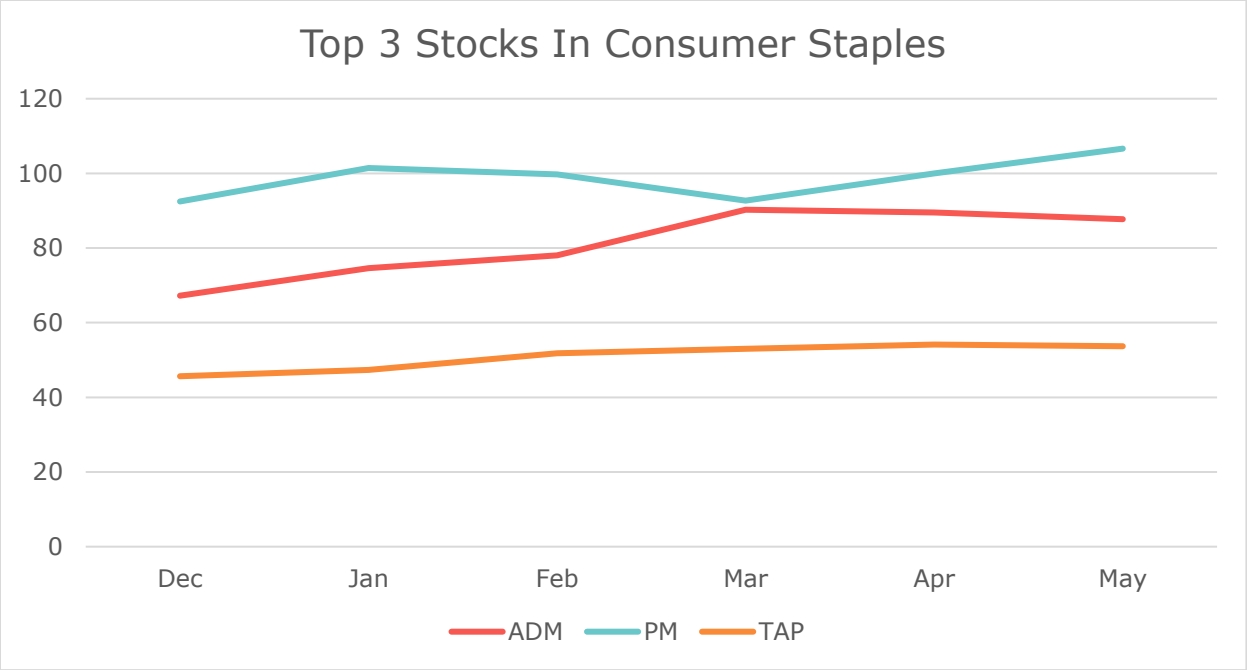
This chart shows us that the top performers in the energy sector outperformed every stock in any sector.



Looking at the top performing stocks in the energy sector, MRO seemed to almost outperform CTRA, eventually losing ground from March to April. CTRA continued its trend.



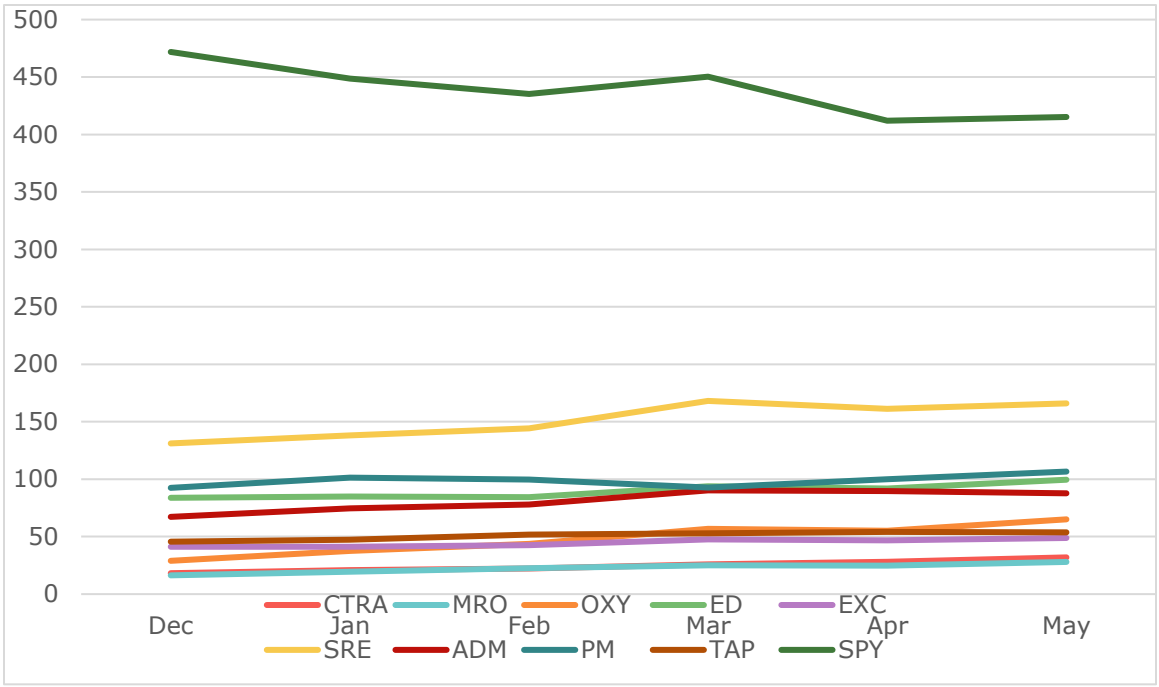
The top performers in the utilities sector saw an upward trend between January and March, eventually giving back what they have gained, except for SRE.



Ticker PM and ADM almost crossed their average closing prices in the month of March, eventually reversing their trends.

6 Month % Change Statistics	
Mean	0.443382093
Standard Error	0.126459687
Median	0.266586875
Mode	#N/A
Standard Deviation	0.379379061
Sample Variance	0.143928472
Kurtosis	1.254597061
Skewness	1.414353999
Range	1.092307585
Minimum	0.15298913
Maximum	1.245296715
Sum	3.990438833
Count	9

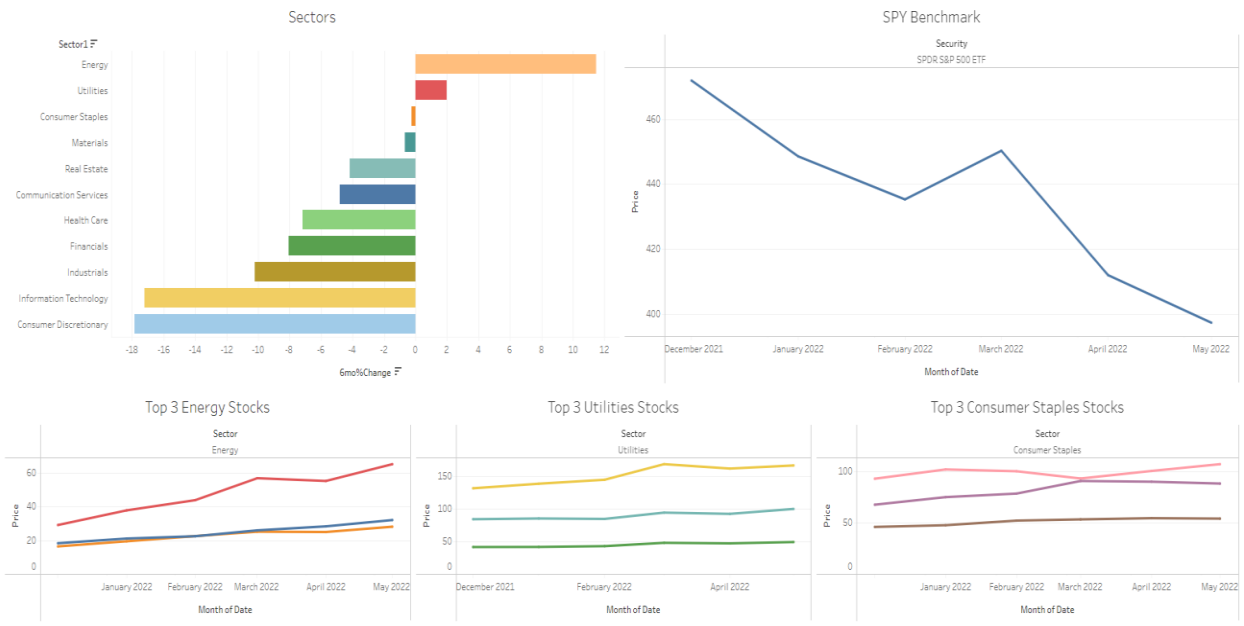
We used our prior excel skills and used a Data Analysis Toolpak plug-in to further analyze the dataset to get in-depth statistics.



Ticker	Company Name	Sector
CTRA	Coterra	Energy
MRO	Marathon Oil	Energy
OXY	Occidental Petroleum	Energy
ED	Con Edison	Utilities
EXC	Exelon	Utilities
SRE	Sempra Energy	Utilities
ADM	ADM	Consumer Staples
PM	Philip Morris International	Consumer Staples
TAP	Molson Coors	Consumer Staples

In conclusion, with the data we have available, we can see that the Energy sector had the best performance compared to any other sector. Retail investors would be more comfortable investing into this sector in a bear market. Now that we have narrowed down our top performing stocks within each sector, we will then proceed to use Relative Price Comparison to determine which individual stocks show relative strength to the S&P 500 Index.

Dashboard



Here we have our main dashboard. Starting from the top-left, we have our bar chart representing the six-month percent change for each sector. Making the chart interactive, users can click on each sector to see which stocks are within the clicked sector. Here, stocks are shown from highest to lowest in correspondence to their six-month percent change. Our main dashboard consists of a data summary of our dataset. A user can click on the menu options of the dashboard, and this will bring them to the individual graph. For example, a user could click on the SPY Benchmark menu to further analyze the graph individually. They're able to see detailed price action in that instant of time (monthly pricing).

Final Observations

After conducting our data analysis, we can infer that the energy sector outperformed any other sector included in the S&P 500. Although most sectors had a negative six-month percent change, the Energy and Utilities sector had a positive percentage in their six-month timeline. Looking into the Energy sector, we can also infer that the top three stocks in this sector outperformed the top three stocks in any other sector. This shows that although the overall market is on a decline, there are stocks within the market that can show resilience and continue to climb in prices. If an investor can analyze the market and make an educated decision on what to invest, it is possible to be profitable in the stock market, good or bad times.

Further Research

To be more precise in our data analysis, we wanted to implement certain stock indicator metrics like P/E ratio, RSI, 200-MA, 50-MA, etc. There is a possibility to further enhance our dashboard by implementing a graph which would allow us to benchmark stocks to each other. Also, by expanding our timeframe while also going to a weekly timeframe for example, this could have given us more data to work with, which in turn would give us more accurate results. The time allotted for this data analysis did not allow us to implement our strategy.