

Stock Indexes vs Macroeconomic Indicators

By: Maura Ellsworth, Armine Arutyunyan, Birundha Varatharajan & Ramazan Khaev

Summary

For our final project, we decided to take a look at 3 different stock indexes, The Dow Jones, Nasdaq and the S&P. Our goal was to determine how these indexes stand up against various macroeconomic factors (CPI, Unemployment, FedRate (interest rates) and Inflation). We used these factors to then build a Machine Learning Model to determine how the Indexes will perform in the future

Data Collection

We have found multiple excel sheets via Kaggle to be used and cleaned for our project.

- Daily open, close high and low for Dow Jones, Nasdaq and S&P from 1/2/2008 to present (we then took the averages of the open and close)
- Daily Inflation & Fed Funds
- Monthly CPI and Unemployment rate

Tools Used

- Python Pandas
- Python Matplotlib
- Machine Learning
- Tableau

Initial Analysis

- Once the data was cleaned, we then did regression lines of the 3 indexes and the macroeconomic factors to see what the highest correlation was
- The highest correlation was between the indexes and CPI (S&P VS CPI at 0.95)
- The lowest correlation was Inflation rate and the indexes (S&P was at 0.23)

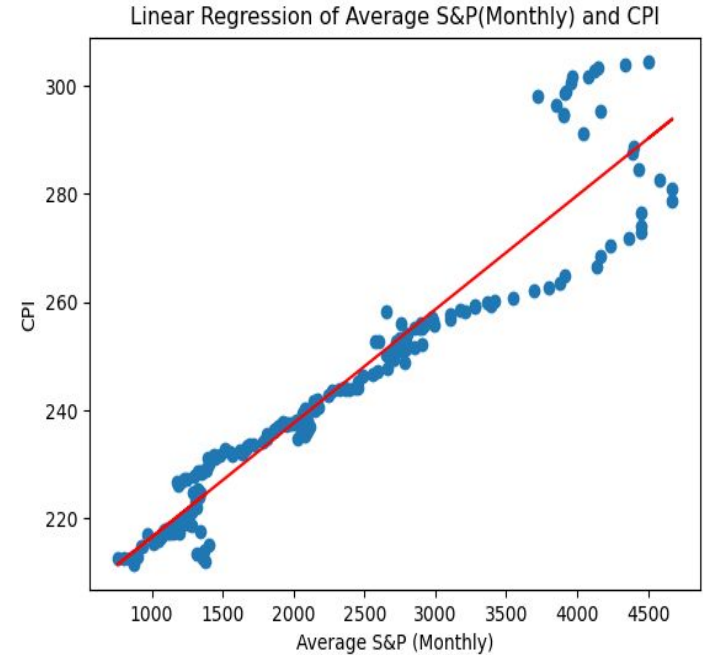
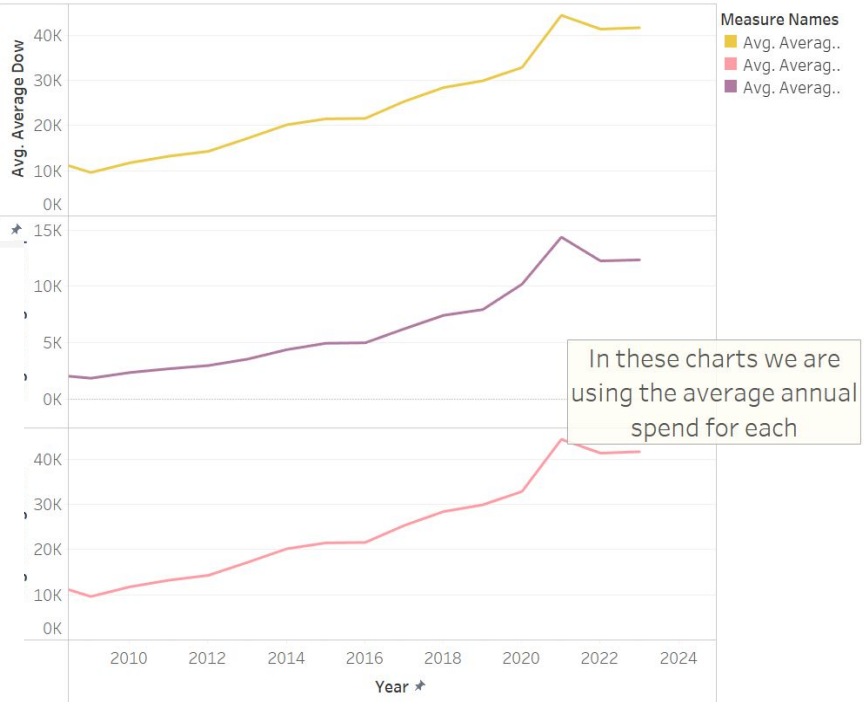
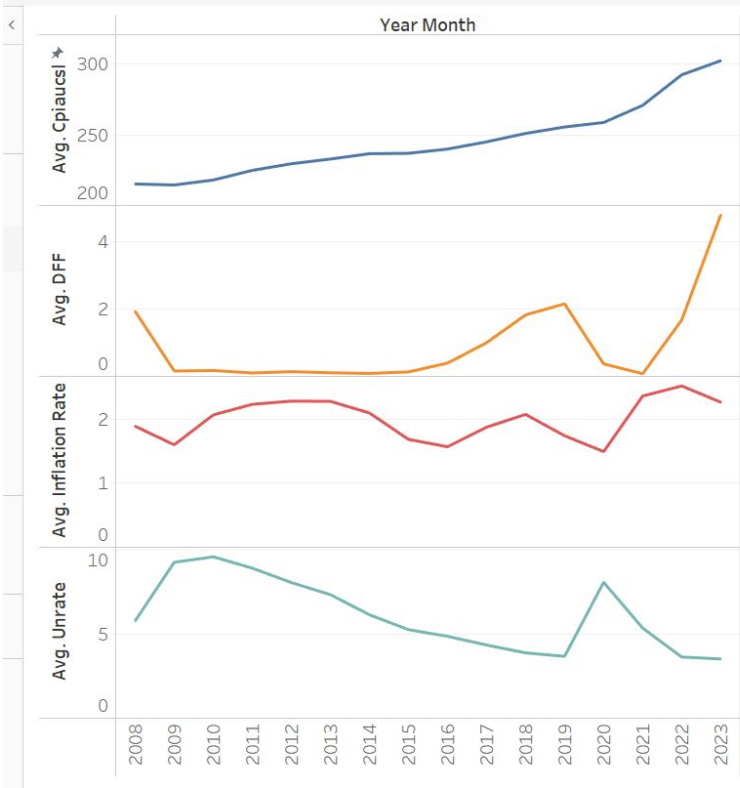


Tableau Analysis



Machine Learning

- We created a Machine Learning model to predict the future state of the various indexes, we did this by using this against our macroeconomic indicators
- For Random regressor model for Dow Jones, Accuracy score is 66% with future parameters CPI,FDD,Inflation and Unemployment Rate
- Future State

Random forest Regression-DOW(daily)with 'Open', 'High', 'Low', 'Volume'

