Week 2 Report

What is the target variable and why?

The target variable is the Federal Funds Target Rate. I chose this because it affects every single aspect of our current capitalist system, in which the availability of credit dictates how we can spend credit cards, plan for the future, and grow as a country. The FOMC minutes give us the clearest sense of the direction that the Federal Funds Rate is going, and incorporating those minutes into a model would be greatly beneficial not just from a stock-picking perspective, but from an information lens as well. The current Fed Chair, Jerome Powell, has made strides to increase transparency when it comes to the Fed so that investors are not presented with a shock on FOMC meetings. The role of the Fed should be to stabilize, and increased transparency would assist in that endeavor.

What are the predictors and why?

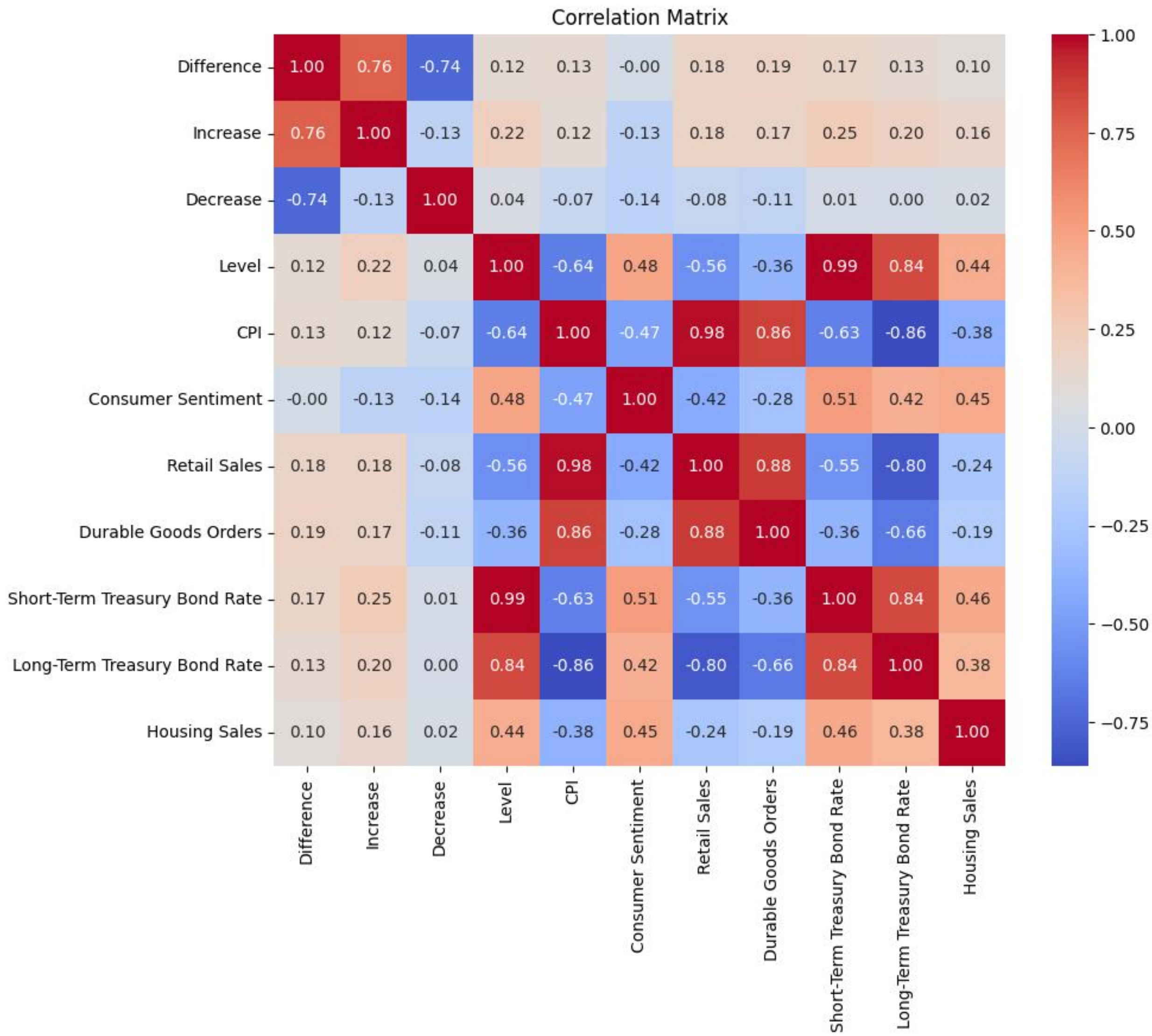
The predictors are as follows: CPI, Consumer Sentiment, Retail sales, Durable Goods Orders, short-term bond rates, long-term bond rates, bank reserves, and Housing sales. One could theoretically bucket these into two categories: inflation sentiment indicators, and macroeconomic health indicators. Inflation sentiment, firstly, would be a factor in the Federal Funds target rate. In this would be consumer sentiment, short-term and long-term bond rates. The higher the level of bond rates, the more inflation people are expecting. Thus, the Fed needs to increase the Fed Funds rate to tamper high inflation. The remaining macroeconomic variables would likely play into the more fundamental calculation of the Fed's inflation metric, in that the dual mandates of monetary policy is to maintain consistent inflation and stable employment. I would have liked to include other metrics like the unemployment rate, TIPS rate, bank reserves, and average hourly wages, but the data was either not available or not clean, and thus was not included. This is unfortunately significantly detrimental to the analysis, as some of these are directly correlated to predicting the federal funds rate.

Here, I'll explain the variables. To begin, with, there are 240 rows and 14 columns. The dates span from February 3rd, 1993 (earliest possible repository data) to March 22nd, 2023 (while FOMC data was available, some corresponding macroeconomic variables were not. For the sake of data availability, they were omitted. Moving onto definitions:

- Federal_Reserve_Mins: The raw data from FOMC minutes. These include text that is yet uncleaned, and is not yet ready to be processed.
- Preprocessed Text: Cleaned version of Federal_Reserve_Mins, replaced with lower case, removed punctuation, and data reverted to its most base form for better translation by the NLP.
- Date: Date of the FOMC. Spans from February 3rd, 1993 to March 22nd, 2023.
- Difference: Change in the Federal Funds Target Rate, if there is one.
- Increase: Amount of increase in the Federal Funds Target Rate, if there is one.
- Decrease: Amount of decrease in the Federal Funds Target Rate, if there is one.
- Level: Federal Funds Target Rate Upper Bound
- Consumer Sentiment: Thought of as a measure of consumer confidence in the economy derived from surveys or indices. Has a mean of 86 and a standard deviation of around 13.

- Retail Sales: The amount of sales in a month. A specifically important measure for CPI, as the amount of sales can dictate the prices for the same basket of goods. A change in the price for goods dictates a change in CPI, which informs inflation.
- Durable Goods Orders: Another metric for sales, but more focused on long-term manufactured products like appliances and machinery. As they reflect more significant purchases, they are thought to be a closer metric for calculating investment, which is also informed by inflationary sentiments.
- Short-term Treasury Bond Rate: The Treasury rate is thought of as a sum of all of the interest rates for the length of the bond. A 3-month Treasury bond is a weighted sum of all of the expected interest rates for borrowing against the government. The Federal Funds Rate shifting up thus would move up the short-term and long-term bond rates (albeit at different rates).
- Long-term Treasury Bond Rate: Similar thinking behind the short-term bond rate.
- Housing Sales: Reflective of a few different metrics, such as the purchasing of manual labor and housing inputs. But as one of the larger industries in America, it is often linked with macroeconomic reports.

Some correlation metrics can be found below;



Some of these metrics do seem to have some predictive power over the target variable, “Level”. Short-Term Treasury Bond Rates are inherently tied to the Federal Funds Rate, so choosing that variable might lead to overfitting. CPI metrics are interesting, in that it doesn’t exactly match the Fed Funds Rate, but also obviously informs it. Further analysis is necessary.