Fed Funds Classifier

Your Key to Early Retirement

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Industry Issue

- The stock market is difficult to predict

- I want to make a return at a consistent rate

- Can machine learning help?

Scope/Process

- Individual stock pricer?
  - Extremely difficult
  - High risk

- Other more macro market indicators?
  - Fed Funds Rate
  - Easier to predict
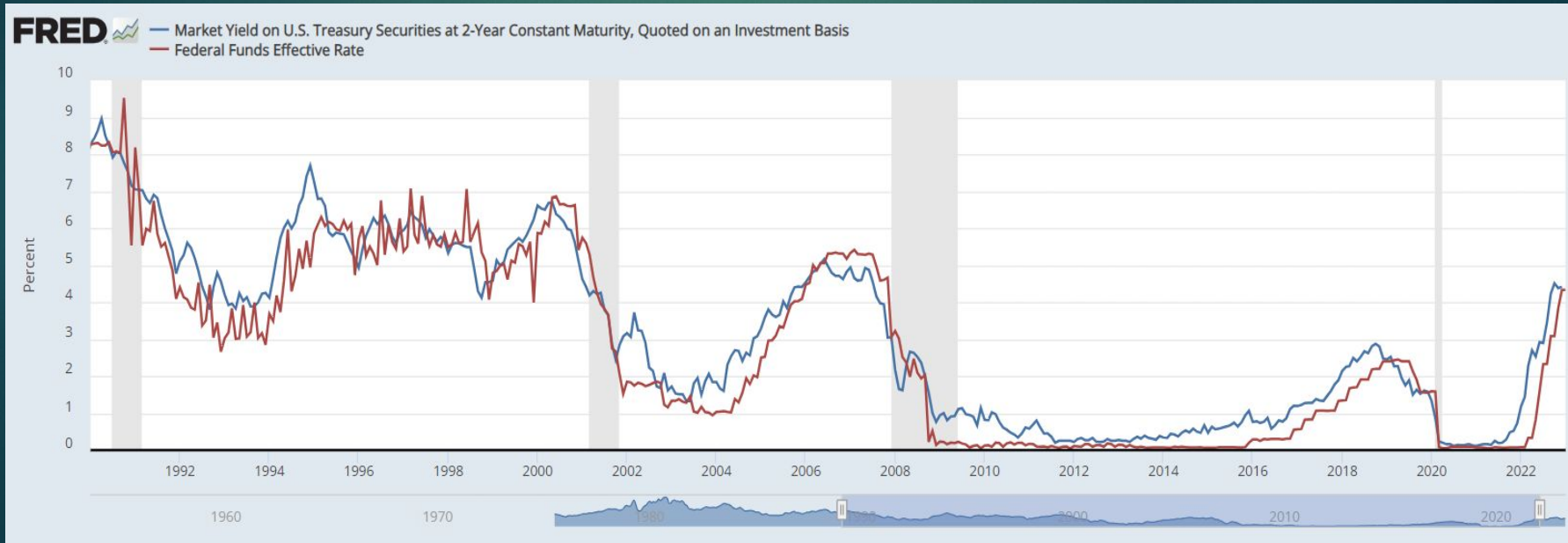 - Can still show direction of market trends

Fed Funds as a Market Indicator

As the Fed lowers/raises rates, long term interest bearing debt tends to follow suit.
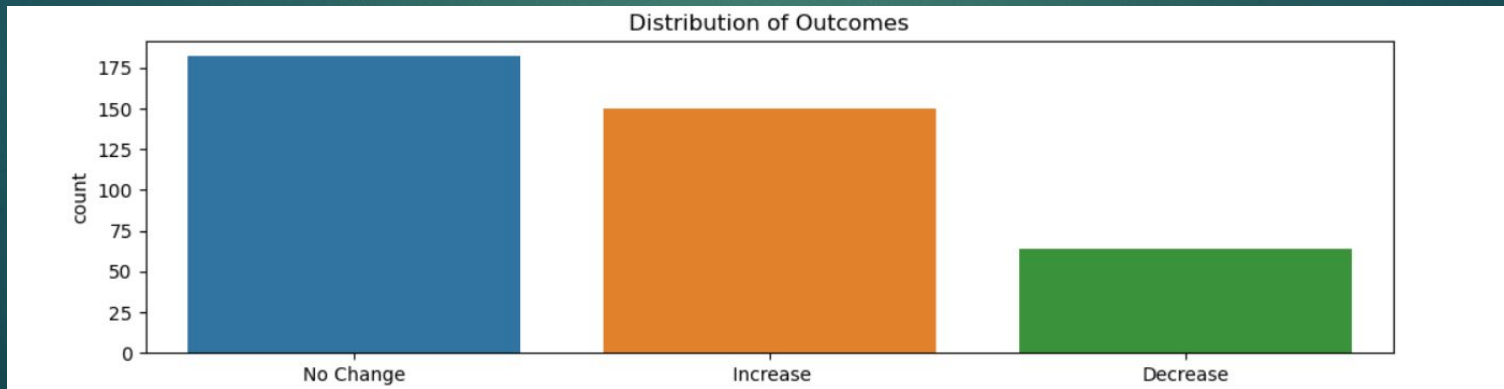
Fed Funds as a Market Indicator

What about short term debt?

EDA/Bucketing

- Classifier
  - Bucketed Rate decision outcomes into sections
    - Increase
    - Decrease
    - No Change (highest %)

Distribution of Outcomes

Simple Models

Feature Set:

- CPI, Inflation, FX Rates, GDP, Manufacturing orders

Logistic Regression:

- Little bit better than a coin toss - 55%

We can do better

Classification Modeling

Tried 3 Types of Tree Models:

- Decision Tree, Bagging Classifier, Random Forest
- DT/RF

```
Training: 0.9274447949526814
Testing: 0.7848101265822784
              precision    recall  f1-score   support

          -1       0.00      0.00      0.00         5
           0       0.78      0.94      0.85        52
           1       0.81      0.59      0.68        22

    accuracy                           0.78        79
   macro avg       0.53      0.51      0.51        79
weighted avg       0.74      0.78      0.75        79
```

```
Training: 0.886435331230284
Testing: 0.6582278481012658
              precision    recall  f1-score   support

          -1       0.00      0.00      0.00         5
           0       0.66      1.00      0.79        52
           1       0.00      0.00      0.00        22

    accuracy                           0.66        79
   macro avg       0.22      0.33      0.26        79
weighted avg       0.43      0.66      0.52        79
```
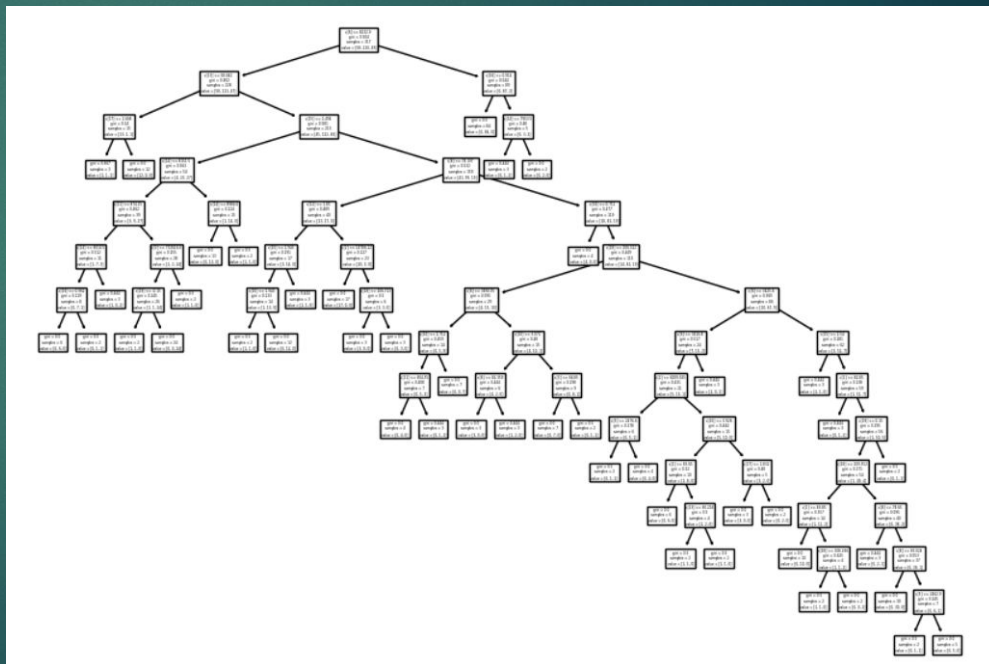
Best Results

Ultimate winner: Decision Tree

Training: 0.9274447949526814
Testing: 0.7848101265822784

Hypertuning:

1) Gini split criterion
2) Max Depth 30
3) Min Samples Split 2
4) Min Sample Leaf 2

Earnings Potential

EOM Date	3 Mo
7/31/2023	0.1200
5/31/2024	0.2500
3/31/2023	-0.0300
2/28/2023	0.1800
12/31/2022	0.0500
11/30/2022	0.1500
9/30/2022	0.3700
7/31/2022	0.6900
6/30/2022	0.5600
5/31/2022	0.3100
3/31/2022	0.1700
Total:	2.8200
78.5%	2.2137

If you use the predictor to use EOM parameters at the current clip

Would be beating the market interest rate by ~2.2%

Low risk (bonds)

Average savings account interest: .5%

Further Analysis

Magnitude (March 2023) - can increase investment size

Other macro sector indicators - Oil barrel pricing?

Using this strategy to invest some of my own money in a live test case

Thanks!

Questions?