

SP500 Market Prediction Analysis

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1 Introduction

Many of us wonder how to profit from the financial world, specifically the stock market. Logically, this task is very challenging and is one of the deeply researched fields in academia. According to the **Efficient Market Hypothesis (EMH)** [Malkiel \[2003\]](#), asset prices reflect all available information, indicating that it is impossible to regularly “beat the market” using solely historical data.

In our project, we will look to analyze how and what to predict the stock market through the S&P 500 index (($\tilde{G}SPC$)). By utilizing historical trading data from 1990 to 2025, we aim to answer the specific questions proposed in our study:

Actually Predicting Market Movement 1. Can we accurately predict short-term movements in the S&P 500 using historical price and macroeconomic data?

Importance of Additional Technical Indicators 2. Which market indicators contribute most strongly to prediction accuracy?

Model Comparison 3. How do simpler predictive models compare to more advanced models in forecasting performance?

2 Data and Methods used

3 Exploratory Data Analysis (EDA)

4 Results of our Model

#Code for our model results, essentially bring them from the model notebook, saved in csv in

5 Discussing our research questions

6 Conclusion

7 References

8 Author Contribution

- **Arhaan Aggarwal** Enter
- **Brian Hwang** I split the main notebook containing all the code into its separate notebooks. I also structured the entire repo, moved all the functions into the scripts folder, and wrote tests for some of them. I also worked on the reproducibility aspect of the project by working on the environment.yml and make files while also beginning the myST stuff.
- **David Robertson** Enter
- **Jose Aguilar** Enter

References

- B. G. Malkiel. The efficient market hypothesis and its critics. *Journal of economic perspectives*, 2003.