Evaluating Investment Strategies: Beyond Buy and Hold
A Quantitative Analysis of S&P 500 and Bond Yields

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March 1, 2025

Market Classification

- **Objective**: Classify market states (Bear, Bull, Static) using S&P 500 data.
- **Methodology**:
  - Calculate rolling peak and trough.
  - Bear: Drawdown from peak ¿ 20%.
  - Bull: Increase from trough ¿ 20%.
  - Static: Neither Bear nor Bull.
- **Implementation**:
  - Python with Pandas, NumPy, Matplotlib.
  - Logging and visualization.
- **Results**:
  - Market state distribution.
  - Plot of S&P 500 with market states.

Market Classification
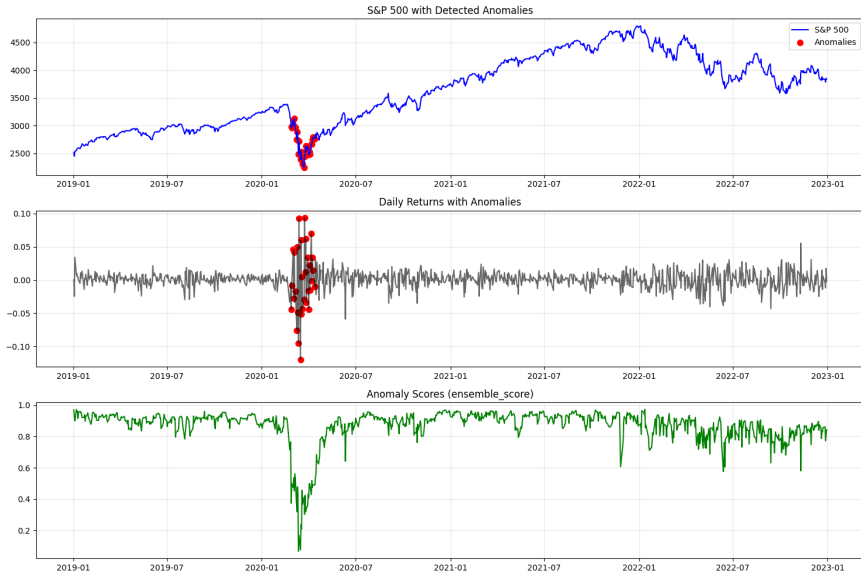
Why Neural Networks for Investment Strategy?

- Neural networks can identify complex patterns in financial data that traditional models are very likely miss
- Our approach avoids hard-coded investment rules, allowing the model to learn optimal strategies directly from historical market data
- This data-driven methodology adapts to changing market conditions more effectively than static strategies
- The model incorporates multiple factors simultaneously, capturing nuanced relationships between S&P 500 movements and bond yields

Anomaly Detection

While creating our model, we realized that there might be certain market conditions that might affect the performance of our investment strategies. For example, in our case, there was the COVID-19 pandemic, which caused the market to perform abruptly. In order to account for that, we developed a neural network that will detect the anomaly and avoid those pitfalls. You can find our analysis on that in `market_anomaly.py`

Anomaly Detection
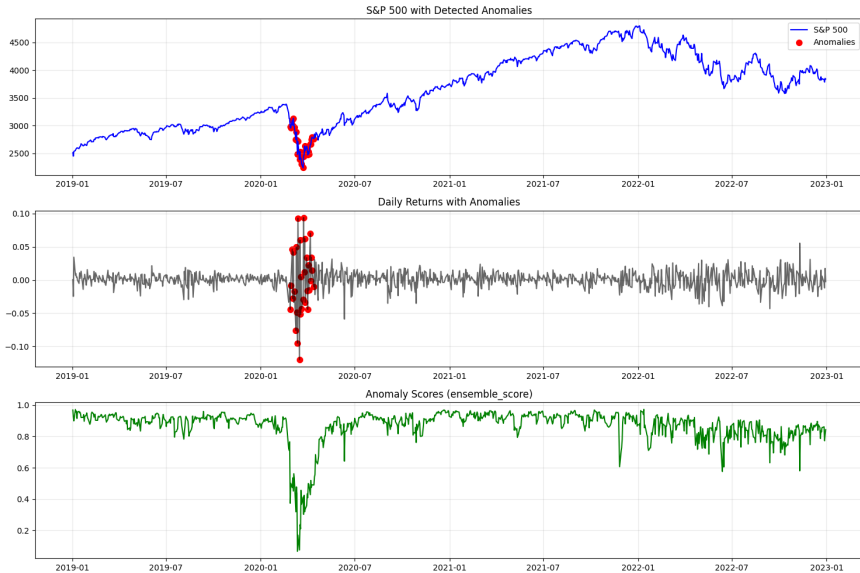
Problem Statement

Although buying and holding is considered the best strategy in investing. We would have to prove or disprove that hypothesis based on the dataset given to us about the price of S&P 500 and bond yield rate.

Our Solution

We will disprove this hypothesis by coming up with our own investment strategy that minimizes risk while maximizing returns. By employing a mixed-methods approach that combines statistical analysis with machine learning techniques, we aim to identify potential patterns and trends within the financial data that can inform our investment strategy. Specifically, we will analyze historical price movements of the S&P 500 alongside various economic indicators, including bond yield rates, to uncover correlations that may suggest more optimal entry and exit.

Bullet Points

- Lorem ipsum dolor sit amet, consectetur adipiscing elit
- Aliquam blandit faucibus nisi, sit amet dapibus enim tempus eu
- Nulla commodo, erat quis gravida posuere, elit lacus lobortis est, quis porttitor odio mauris at libero
- Nam cursus est eget velit posuere pellentesque
- Vestibulum faucibus velit a augue condimentum quis convallis nulla gravida

Blocks of Highlighted Text

In this slide, some important text will be highlighted because it's important. Please, don't abuse it.

Block

Sample text

Alertblock

Sample text in red box

Examples

Sample text in green box. The title of the block is "Examples".

Multiple Columns

Heading

1. Statement
2. Explanation
3. Example

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Integer lectus nisl, ultricies in feugiat rutrum, porttitor sit amet augue. Aliquam ut tortor mauris. Sed volutpat ante purus, quis accumsan dolor.

Treatments	Response 1	Response 2
Treatment 1	0.0003262	0.562
Treatment 2	0.0015681	0.910
Treatment 3	0.0009271	0.296

Table: Table caption

Theorem

Theorem (Mass–energy equivalence)

$E = mc^2$

Figure

Uncomment the code on this slide to include your own image from the same directory as the template .TeX file.

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