Enhancing Equity Strategies with Affor Analytics Trading Signals

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Key Takeaways

This paper shows how Affor Analytics' trading signals can be integrated into a traditional market cap-weighted S&P 500 Index strategy to adjust portfolio weights based on signal strength. By overlaying these signals, we maintain allocations close to the original weights, ensuring minimal deviation from the initial risk profile.

- **Overlaying Affor Analytics' trading signals by tilting a market cap-weighted portfolio improves annualized returns by 50bps with an information ratio of 0.52.**
- **Tilting a portfolio using Affor Analytics' signals results in the same risk profile with a slight decrease in volatility and maximum drawdown.**
- **The tilted portfolio outperformed the benchmark 75% of the time over various market conditions.**

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Introduction

As markets fluctuate, the goal of beating the market often feels elusive for investors. But what if we could leverage independent trading signals to give our strategy a clear edge – without disrupting the original objectives or risk profiles? Let's dive into how Affor Analytics' trading signals can elevate a simple market-cap strategy and unlock stronger performance, all by making smart adjustments to portfolio weights.

Starting with a straightforward market-cap-weighted strategy on the S&P 500 Index, we introduce our signals to make subtle, data-driven tweaks. This allows us to fine-tune the portfolio, shifting weights based on signal strength, but without straying far from the original setup. The result? A portfolio that stays true to its roots while embracing a performance boost – without the risk of unexpected volatility.

From here, we'll break down our approach step by step, from understanding the signals we use, to the data driving them, right through to the methodology that powers our adjustments. Finally, we'll dive into the backtest results and what they mean for investors looking to get more out of their portfolios.

Data

Affor Analytics Signals

The Affor Analytics signal is a cross-sectional indicator designed to predict whether a company will outperform its peers in the upcoming period. These signals are generated from a combination of customized machine learning models trained to interpret a blend of data, consisting of, but not limited to, fundamental, technical, and sentiment data.

The underlying machine learning algorithms leverage many years of historical data, adjusted for historical constituents ensuring no forward-looking biases. Although reliant on historical data, each model is tweaked to adapt to new market circumstances while preserving robust long-term valuation precision. By carefully combining a multitude of models, different periods and conditions are used to form a more accurate prediction.

The model is calibrated to be sector-neutral such that any resulting signals have no tilt to any particular industry. This neutrality allows for fair comparisons of companies within sectors and helps in maintaining a well-diversified portfolio while using fewer constraints.

In order to effectively handle and apply our signals, the model is designed to generate normally distributed signals. This makes comparing signals more convenient between different companies as well as over time.

Data Sources

All data used during this research is sourced from Refinitiv Datastream and spans from Jan-2005 to Sep-2024, containing various market conditions for evaluating strategies.[1] Historical constituent lists of the S&P 500 Index are used to accurately reflect included companies at each point in time and ensuring an accurate backtest. Historical pricing and dividends for all historical constituents are used for simulating performance, keeping track of corporate actions to adjust performance accordingly. Market capitalization for all companies is used in order to adjust the baseline weights.

Methodology

The Weight Enhanced Strategy aims to overweight stocks likely to outperform and underweight those likely to underperform. In this way performance of the strategy can leverage the predictive power of our signals, while maintaining closely aligned with the original exposures and investment targets.

To integrate the signals into an existing portfolio, we adjust the portfolio weights using the following formula:

$$w_i = w_i \times \left(1 + \frac{s_i}{\sigma_s} \times \frac{D}{d}\right)$$

where:

- w_i is the original weight of stock i in the S&P 500 Index.
- s_i is the signal for stock i at a specific point in time.
- σ_s is the cross-sectional standard deviation of the signals s_i across all stocks at that time.
- D is the desired maximum deviation from the original weight.
- d is the number of standard deviations corresponding to the desired interval which should contain all deviations (e.g., a value of 3 gives a 99.7% interval for a normal distribution, scaling the signals such that 99.7% of all weight adjustments will be smaller in magnitude than the desired maximum deviation D).

For this research we take $D = 1$ and $d = 3$ to have weights deviate less than 100% from the original weight for 99.7% of the time:

$$w_i' = w_i \times \left(1 + \frac{s_i}{3\sigma_s}\right)$$

The signal s_i is divided by the cross-sectional standard deviation σ_s to standardize it, ensuring that the signals are on a comparable scale at that point in time. The term $(1 + s_i/3\sigma_s)$ serves as an adjustment factor, which is positive (negative) if the signal s_i is positive (negative), increasing (decreasing) the weight. By scaling the weights multiplicatively with the adjustment factor, we ensure that adjustments are scaled by the original market cap-weighted weight and deviations aren't too large for small and often more illiquid stocks.

After adjusting the weights for all stocks, they are normalized to ensure the sum of all weights sums up to 1:

$$w_i'' = \frac{w_i'}{\sum_{j=1}^{N} w_j'}$$

where:

- w_i'' is the final normalized weight of stock i.
- N is the total number of stocks in the portfolio.

Results

To see how well our Weight Enhanced Strategy performs, we ran a backtest, comparing it to the benchmark, which sticks to the original weights. We rebalanced the portfolio monthly, reinvesting dividends along the way. We kept things realistic, assuming enough market liquidity, since the weight shifts we're making scale with market cap, keeping deviations under control.

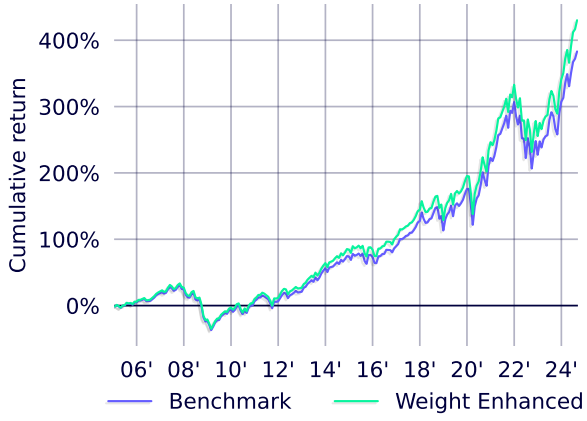

Figure 1: Cumulative backtested returns of the Weight Enhanced Strategy and the benchmark over the period January 2005 until August 2024.

[1]The models used by Affor Analytics to create the signals do use data before 2005-1-1 and from other data sources to be trained.

	Benchmark	Weight Enhanced
Return	8.4%	8.9%
Volatility	19.2%	19.0%
Maximum Drawdown	-56.0%	-55.5%
Information Ratio		0.52

Table 1: Annualized backtest results over the period January 2005 until August 2024 for the benchmark and the Weight Enhanced Strategy.

Comparing the enhanced strategy to the benchmark reveals a notable difference in performance over time. Over the whole period, the benchmark achieved an annualized return of 8.4% with a volatility of 19.2%. By applying the signals, the enhanced strategy increased the annualized return to 8.9%, an improvement of 50 basis points, suggesting that the signals can enhance performance on top of the original weights.

Notably, the higher return was achieved with slightly lower volatility and a smaller maximum drawdown, though the differences are modest. This demonstrates that the adjustments increased returns without introducing additional risk and may have contributed to a more stable return profile.

The enhanced strategy has an information ratio of 0.52, measuring the excess return over the benchmark per unit of extra risk taken. This suggests consistent outperformance over the benchmark by the enhanced strategy.

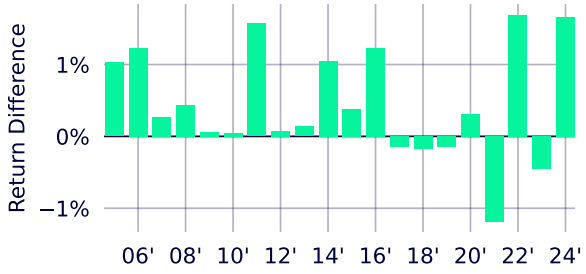

Figure 2: Difference in annual return between the Weight Enhanced Strategy and the benchmark for 2005 till 2024.

During the financial crisis in 2008 and bear market in 2022, the enhanced strategy showed better resilience to the market uncertainty and improved annual return by 0.4% and 1.7% respectively. Only in 2021, during extraordinary market circumstances, and in 2023 with a sharp market rebound from the year before, did the enhanced strategy lack in performance, with differences of -1.2% and -0.5% respectively.

Over almost two decades, the enhanced strategy has outperformed the benchmark in 15 out of 20 years, leading to higher annual returns. By making modest, informed adjustments based on predictive signals, the enhanced strategy managed to capitalize on opportunities without deviating from core investment foundations.

Conclusion

This study illustrates how overlaying Affor Analytics trading signals onto a traditional market cap-weighted portfolio can improve its performance. By adjusting weights based on the predictive signals—while keeping deviations modest— we found that the strategy outperformed the benchmark by 50 basis points, while keeping the same risk profile. Over a 20-year period, the strategy outperformed 75% of the time, demonstrating consistent value across various market conditions.

Affor Analytics' signals open up practical ways for traders to boost their investment strategies by integrating predictive analytics. By overlaying the signals onto existing portfolios, traders can tweak their asset allocations, improving returns without significantly changing the risk profile.

There are many ways to extend on the strategy. To further limit potential risks, one could impose additional constraints by clipping the adjustments or adding other restrictions to adhere to different investment mandates.

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