MACPHAIL QUANTITATIVE INVESTMENT FIRM

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The MacPhail Quantitative Investment Firm (MQIF) is focused on combining optimal long-term growth with risk-adjusted returns over the next five years. MQIF is the ideal firm for the low-risk investor seeking a quantitative approach to investing. We'll break down MQIF's investment strategy below, showing you how you can still make money over five years without risking too much.

Investment Philosophy

To meet the goals of investors seeking long-term growth with risk-adjusted returns, MQIF focuses on ETFs. Given the goal of minimizing risk, ETFs allow for easier diversification by avoiding concentration in individual assets. They also provide a level of liquidity and transparency that can't be found in options, futures, and cryptocurrencies. ETFs also allow for more cost-efficient spending, as the expense ratios for most ETFs are very low. It's also easy to diversify our investments, as ETFs provide exposure to multiple asset classes, including equities, bonds, real assets such as gold, commodities, or real estate, and alternatives like managed futures or volatility hedges.

MQIF's philosophy centers on a buy-and-hold strategy, which aligns with the emphasis on long-term growth and risk management. Rather than trying to predict short-term market movements, MQIF focuses on patience and investing in assets that are likely to provide returns over a long-term basis. This will help us avoid short-term volatility and minimize investor risk. MQIF focuses on ETFs for several reasons. ETFs offer broad exposure to markets, allowing growth to accumulate while mitigating the risks associated with investing in individual companies or sectors. ETFs typically have low expense ratios, and a buy-and-hold approach minimizes trading costs and taxes. Low-volume trading ensures that dividends, interest, and capital gains are reinvested and allowed to grow. Buy-and-hold helps us resist reacting to short-term noise, anchoring our decisions in fundamentals rather than speculation. Buy-and-hold does not mean we never adjust. We rebalance periodically to maintain optimal risk levels, while avoiding unnecessary trading. By committing to a buy-and-hold discipline, we give our portfolio the best chance to participate in long-term market growth while minimizing the drag of costs, taxes, and emotional mistakes.

Asset Selection & Allocation

To determine which ETFs to invest in, MQIF uses a quantitative approach based on a comprehensive list of all ETFs according to polygon.io. The list of ETFs is filtered down to only active ETFs with at least 5 years of data and a daily volume of at least 100,000 shares. The ETFs are segmented into equities, fixed income, alternatives, and liquidity. To decide which other ETFs to filter out, the Sharpe Ratio is calculated for each ETF. Given the focus on minimizing risk, the Sharpe Ratio is prioritized as the metric to use for evaluating which ETFs to invest in, rather than average annual returns. A rolling 12-month Sharpe Ratio is used for diagnostics and visualization, but to rank and select ETFs for the portfolio, the Sharpe Ratio will be calculated over the entire five-year period.

To help maintain diversification, a minimum of 20 and a maximum of 40 assets are selected from the curated ETF list. Each asset is classified into one of the following categories: Equities, Fixed Income, Alternatives, Liquidity, and Blended/Multi-Asset, based on information retrieved from the ticker API in the Yahoo Finance package using Python.

The asset classes are optimized based on the Sharpe Ratios for each asset, but a minimum threshold is established for each class. Rather than treating each ETF the same, once the number of assets is selected, their weights are optimized for the highest aggregate portfolio Sharpe Ratio.

Performance Evaluation

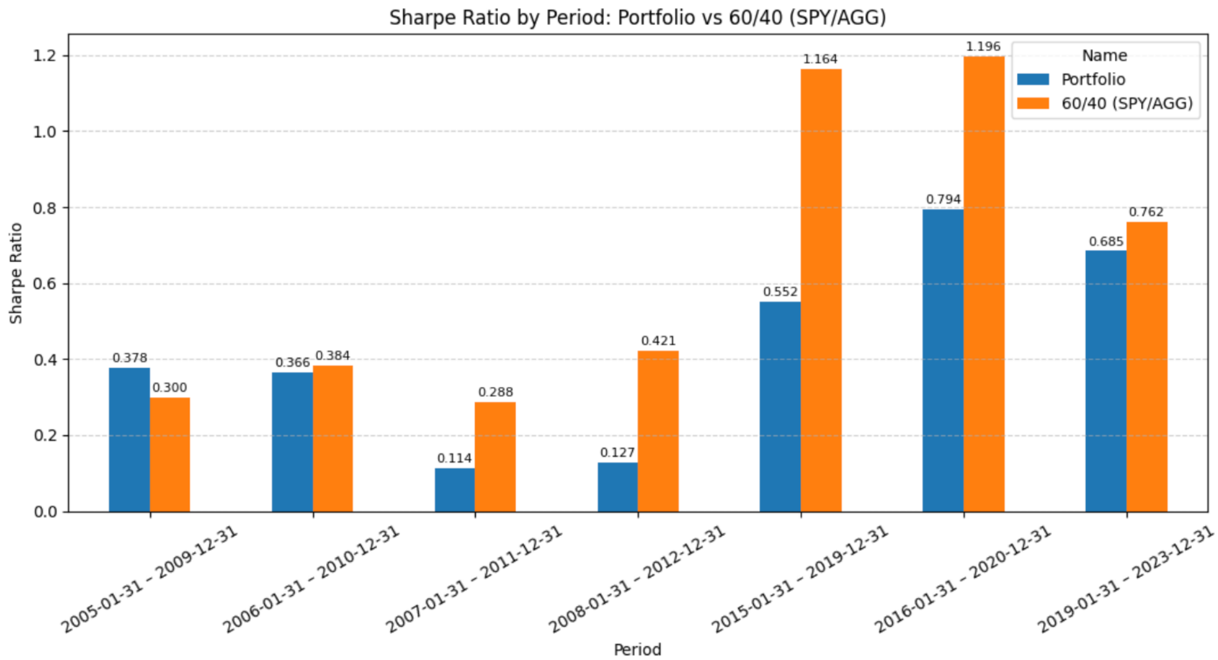
To evaluate the performance of the portfolio, backtesting is applied over different periods to assess how the methodology would perform in various scenarios. Performance can be evaluated in various market environments or during extreme scenarios to determine how resilient the portfolio is in terms of risk. Because the ETFs and their associated weights are dynamically chosen, the portfolio methodology can be tested over any period. The portfolio can also be evaluated across various metrics, including returns, volatility, the Sharpe ratio, Beta, and Alpha. Given the goals of long-term growth and risk-adjusted returns, it makes sense to compare the portfolio against similar strategies. A 60/40 split of the S&P 500 (SPY) and the US Aggregate Bond ETF (AGG) over the same periods provides a good benchmark of a portfolio that's heavily focused on equities and bonds.

Since we're evaluating the strategy over five years, MQIF's portfolio is evaluated against every five-year stretch since the year 2000. For example, 2000-2004, 2001-2005, 2002-2006, would all be permutations to evaluate. This enables MQIF to evaluate the portfolio in both strong and weak market conditions. The 2008 Financial Crisis, as well as the COVID-19 pandemic in 2020, give good opportunities to evaluate the portfolio in extreme conditions to prove its ability to limit risk.

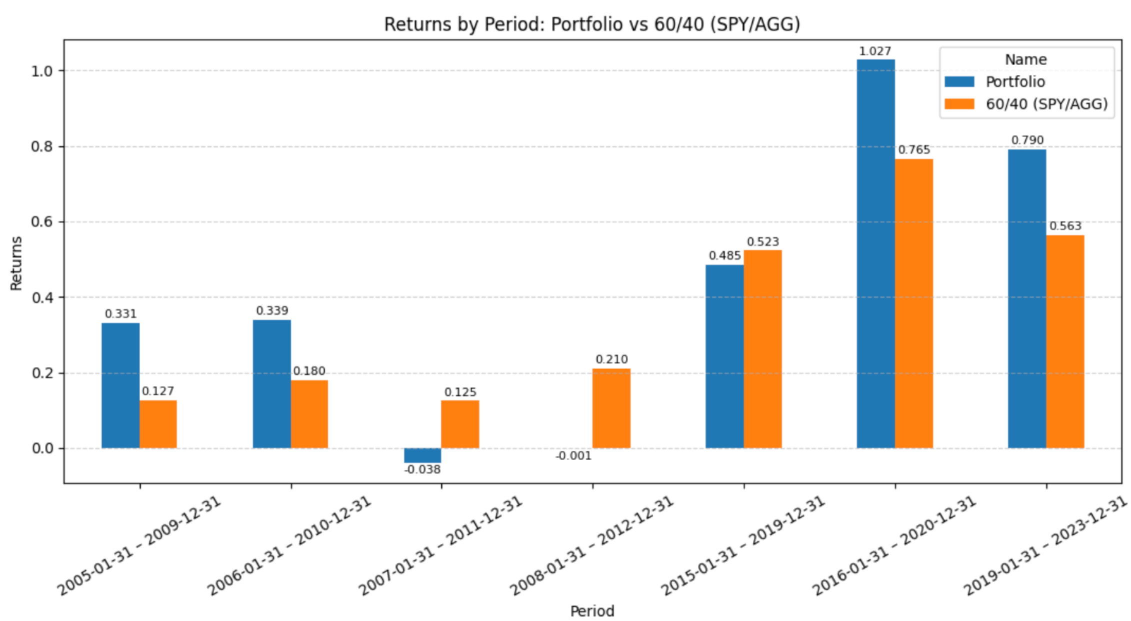
Performance Summary

Rather than look at every permutation from 2000 to 2025, we'll focus on a subset of five year stretches that encompass the 2008 Financial Crisis and the 2019 COVID-19 pandemic.

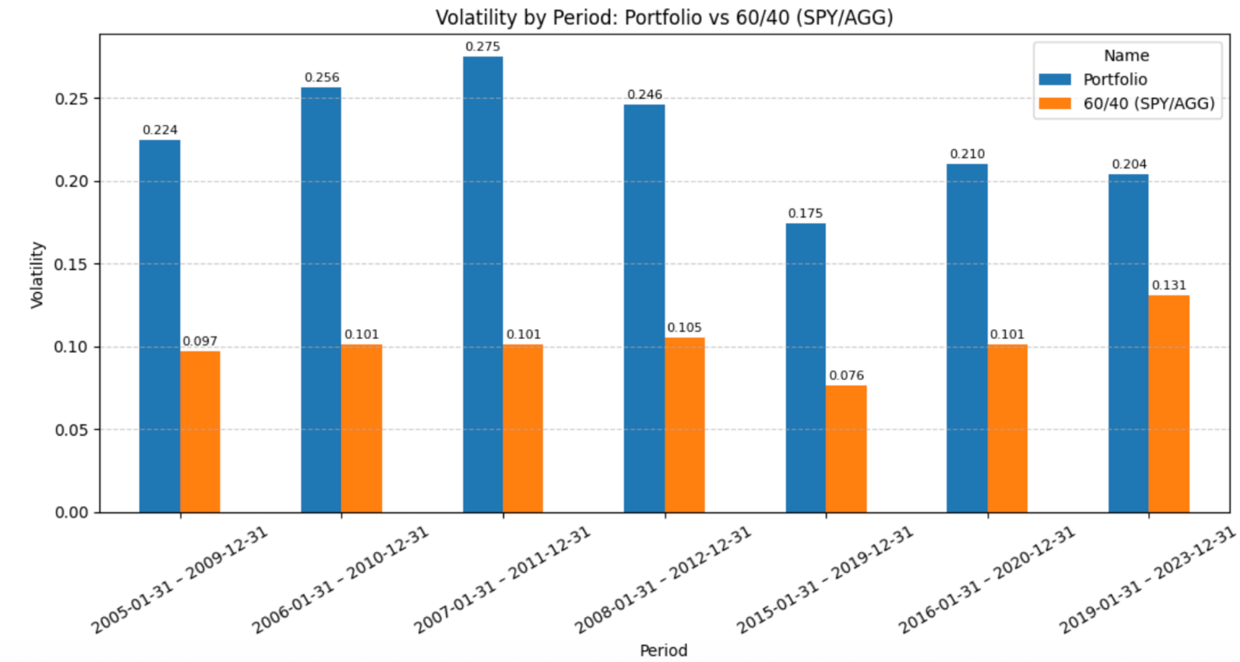
Below is a chart comparing the Sharpe Ratios of the MQIF portfolio vs. the 60/40 split of SPY and AGG



Unfortunately, the 60/40 SPY/AGG portfolio has higher Sharpe Ratios in each five year split except the 2005 to 2010 stretch. We can see in the chart below that the MQIF has higher returns than the 60/40 SPY/AGG split in 4 of the 7 periods.



However, if we look at the volatility of the portfolios in each period, we can see that the MQIF is experiencing higher volatility consistently compared to the SPY/AGG portfolio.



Compensation

Given that the portfolio's focus is on long-term growth, risk-adjusted returns, and minimizing risk over a five-year period, compensation is derived from a combination of management fees and performance fees. The management fee is low and transparent, given that we're managing a systematic ETF portfolio. MQIF charges 0.50% annually. Since MQIF optimizes for risk-adjusted returns, performance fees are tailored around our performance against the 60/40 SPY + AGG benchmark or the AOM. MQIF charges 15% of the excess alpha above the SPY + AGG or AOM. MQIF is compensated when it outperforms realistic alternatives for clients seeking a similar investment approach. MQIF is also compensated 15% of returns that are above a 1.0 Sharpe Ratio. This ensures that MQIFs' incentives are the same as those of its investors in terms of protecting capital and compounding smartly.

Management Recommendation

Despite the belief in the overall philosophy of the MQIF fund, we cannot recommend starting the fund at this time. MQIF's strategy and portfolio were able to generate higher returns than a 60/40 split of SPY + AGG in certain periods, but not consistently. More importantly, the Sharpe Ratios were significantly lower than those of the SPY + AGG portfolio and did not achieve one of the primary objectives of minimizing risk for investors. The level of volatility for the MQIF portfolio is currently too high to compete with a simple buy-and-hold of the SPY + AGG portfolio. There are still potential ways to improve the volatility of the portfolio. Revisiting the asset allocation strategy by focusing on predicting the Sharpe Ratio of all ETFs, rather than selecting assets with the best Sharpe Ratios over the previous five years, is one potential solution. Once MQIF finds a way to lower the volatility of the current strategy, investors looking for long-term growth with minimal risk will find success investing with MQIF.