

# Evaluate the performance of Large Capitalized Multi-Factor Portfolio: Evidence from the United States of America

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DOI: <https://doi.org/10.47772/IJRISS.2026.100400519>

Received: 28 January 2026; Accepted: 03 February 2026; Published: 16 May 2026

## ABSTRACT

The study sought to evaluate the performance of the Large Capitalized Multi-Factor Portfolio, using the United States of America as the case study. The study specifically concentrated on constructing a portfolio from the S&P 500 using a multi-factor model that integrates value and momentum, and calculates the portfolio's historical risk-return profile, including its annualized return, volatility, and Sharpe ratio over 5 years. The study employed the use of a multi-factor asset pricing approach and contemporary portfolio theory to quantitatively analyse the portfolio performance. It employed the use of the Sharpe ratio to calculate excess return per unit of risk, and compare the performance against an equal-weighted benchmark, as well as the risk-return relationship. Data for the study were obtained from the Stocks.csv file, which covered the period from July 6, 2020, to July 7, 2025, and was used for the Python analysis. For each of the twelve chosen securities, there were 3,144 observations in the dataset that included weekly prices and returns. To guarantee consistency across time and tickers, the data was prepared and cleaned. A continuous time series was created for each stock by recalculating missing return values using the percentage change in weekly closing prices. The Sharpe ratio was calculated using a 4 percent annual risk-free rate, and annualised return and volatility were computed by scaling weekly statistics using a 52-week factor. As a neutral gauge of market-level performance, the benchmark consisted of an equal-weighted portfolio of the same twelve securities. The study revealed that the investment structure is well-balanced and diversified. It was found that the portfolio consistently has weekly performance patterns. This shows that the portfolio's returns are both positive and have minimal volatility, both of which are necessary for preserving a reasonable degree of risk exposure. Based on the findings, it is concluded that the portfolio had a Sharpe ratio of 1.12 and an annualised return of roughly 31.66% with a volatility of 24.72%. By outperforming an equal-weighted benchmark in both absolute and risk-adjusted performance, these metrics demonstrate the portfolio's capacity to produce significant returns while skillfully managing risk. The importance of diversification, which was essential in reducing unsystematic risk and improving overall portfolio stability, is further supported by the covariance matrix analysis. The conclusion is further drawn that the value-momentum combination's cumulative growth trajectory, which shows consistent superior performance over time, validates the theoretical framework supporting it as a feasible investment strategy. This steady upward trend indicates the strategy's potential for long-term profitability in addition to highlighting its efficacy.

**Keywords:** Performance of Large Capitalized Multi-Factor Portfolio, risk, investment returns, portfolio optimisation.

## INTRODUCTION

Portfolio optimisation, which enables investors to balance risk and return in the volatile stock market environment, is the cornerstone of contemporary investment theory in this cutthroat business world. Models for portfolio management are essential for optimising returns and lowering investment risks, especially in volatile and ever-changing markets. The models help investors with an efficient method to balance expected returns with the risks involved. Oloke et al. (2022) found that many investors continue to rely on traditional and informal methods for making investment decisions. According to Oloke et al. (2022) and Nnamani (2017), these investors

do not employ the use of quantitative tools that could help them obtain better returns and thereby encounter unstable performance, a decline in capital, and failure to maximise their returns from investments.

Multi-factor investing leverages various attributes—such as value, size, momentum, and profitability—to enhance returns and mitigate risk. According to research, multi-factor approaches frequently produce better results by diversifying exposure across various risk factors, even though traditional single-factor models have demonstrated efficacy (Fama & French, 2018; Aspris et al., 2020). Additionally, research has looked at how these tactics hold up over market cycles. According to research by Barroso and Santa-Clara (2019), multi-factor portfolios can perform better than benchmarks in erratic markets, demonstrating their resilience. Furthermore, incorporating machine learning methods has been emphasised as a potential way to improve factor selection and portfolio optimisation (Gu et al., 2021).

Chen et al. (2022) discovered that over five years, portfolios weighted by both value and momentum factors performed better than conventional capitalisation-weighted indices.

According to research, these portfolios' diversified exposure to a variety of factors that can reduce risks and increase returns can help them outperform traditional market indices (Fama & French, 2015). For example, it has been demonstrated that the combination of momentum and value strategies produces positive alpha, especially in volatile markets (Asness et al., 2019). These businesses use methodical approaches that make use of quantitative models to find stocks with advantageous characteristics.

Portfolio managers seek to capture excess returns while keeping a balanced risk profile by choosing large-cap stocks that exhibit strong fundamentals and market trends. According to recent research, market cycles can have a substantial impact on factor returns, highlighting the significance of macroeconomic factors in affecting the performance of these portfolios (Feng et al., 2020).

Studies conducted in the United States have shown that large-cap stocks tend to exhibit recurring trends that align with multi-factor models. The case for incorporating a variety of factors into portfolio construction is supported, for example, by the fact that large-cap value stocks have historically produced higher returns than their growth counterparts (Fama & French, 2015). Furthermore, research indicates that incorporating momentum strategies into conventional elements can further enhance portfolio performance (Jegadeesh & Titman, 1993).

Multi-factor portfolios built from large-cap U.S. stocks outperformed conventional benchmarks over extended investment horizons, according to a noteworthy study by Blitz and van Vliet (2007), demonstrating the efficacy of this strategy in leveraging systematic risk factors. Warnings or Next Action: The advantages of multi-factor investing are supported by the literature currently in publication, but it is crucial to take market conditions and possible shifts in factor performance over time into account. According to a study by Kahn and Rudd (2021), multi-factor portfolios typically perform better during times of economic expansion because they are exposed to growth-oriented sectors. On the other hand, low-volatility stocks' defensive characteristics frequently act as a buffer against losses during downturns.

## **Problem statement**

Large-capitalized multi-factor portfolio performance evaluation has received a lot of attention lately, particularly as investors look for strategies that use different factors—like quality, momentum, and value—to manage risk and increase returns. There is still a lack of knowledge regarding how these factors interact in the context of large-cap portfolios in the U.S. market, despite substantial research on individual factors. In order to create a thorough framework for assessing their efficacy, this study attempts to methodically examine the performance metrics of such portfolios using techniques and conclusions from recent literature (e.g., Fama & French, 2018; Aspris et al., 2020).

Financial research has focused a lot of attention on the assessment of Large Capitalised Multi-Factor Portfolios, especially concerning their performance in the US. Important research has examined how these portfolios, which usually incorporate a number of variables like size, momentum, and value, perform in comparison to conventional benchmarks. The groundbreaking work by Fama and French (1993), which created a framework for comprehending the impact of size and value factors on stock returns, is one of the field's notable contributions.

Additional studies, like the one carried out by Aspris et al. (2017), investigate the effectiveness of multi-factor strategies under various market circumstances and offer empirical data on their risk-adjusted returns. By evaluating how these portfolios perform in times of market stress in comparison to single-factor or conventional investment strategies, other studies have also helped to clarify the dynamics of multi-factor investing. For example, a study on single-factor strategies has demonstrated that combining multiple factors can result in superior performance (Baker et al., 2021).

To explain stock returns in the United States, Fama & French (1993) developed a three-factor model that takes into account market risk, size (small vs. large capitalisation), and value (high vs. low book-to-market ratios). They discovered that smaller businesses and those with higher book-to-market ratios typically performed better than larger businesses, highlighting the significance of these elements in portfolio management. The groundwork for later studies on multi-factor investing was established by this fundamental work.

Aspris et al. (2017), on the other hand, concentrated on large-cap multi-factor portfolios and examined how different factors affect their performance over time. According to their findings, performance metrics can be improved by integrating multiple factors, even though large-cap stocks have historically provided lower returns than small-cap stocks. Aspris et al. (2017) pointed out that while conventional models frequently ignore how market volatility affects factor performance, adding such dynamics could result in more reliable investment strategies.

Barroso and Santa-Clara (2015) looked at the performance of multi-factor portfolios in international markets and found that their efficacy can vary significantly based on market dynamics and the state of the economy. The performance of these portfolios is heavily influenced by variables like interest rates, inflation rates, and general market sentiment. Barroso and Santa-Clara (2015) discovered that market cycles and current economic conditions have a major impact on the performance of multi-factor portfolios.

It is evident that these aforementioned studies primarily focused on diverting areas, and before 2020, no study has also found a contradicting view. This leaves a gap that must be filled. Furthermore, in the context of the performance of the Large Capitalized Multi-Factor Portfolio, it is unclear whether the Large Capitalized Multi-Factor Portfolio has a favourable or negative impact on investors' return in the United States of America. Hence, the purpose of this study is to evaluate the performance of a Large Capitalized Multi-Factor Portfolio focused on the United States of America.

### **Objective of the study**

In general, the study aims to evaluate the performance of Large Capitalized Multi-Factor Portfolio: Evidence from the United States of America. The study specifically concentrated on:

1. To construct a US portfolio from the S&P 500 using a multi-factor model that integrates value and momentum.
2. To calculate the portfolio's historical risk-return profile, including its annualized return, volatility, and Sharpe ratio over 5 years.

### **Significance of the Study**

Studying the performance of large-capitalized multi-factor portfolios in the United States is important because investors are increasingly interested in strategies that utilize multiple factors, such as quality, momentum, and value, to achieve better investment results. This is significant because it provides evidence-based insights that may influence investment choices. Additionally, by identifying the elements that have the biggest impact on performance, this study enables investors to adjust their strategies.

Furthermore, comprehending the dynamics of large capitalised stocks within a multi-factor framework can shed light on how various market circumstances impact the performance of a portfolio. In addition, the results from the study serve as a base for institutional and individual investors seeking to maximise their asset allocation in a more complicated financial environment.

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## LITERATURE REVIEW

The study reviewed both theories and empirical literature to achieve its purpose of evaluating the performance of Large Capitalized Multi-Factor Portfolio using the United States of America as the case study.

### Theory foundation

Portfolio optimisation, which seeks to minimise risk and maximise returns, is an important area of finance. A well-known study by Arora et al. (2021) demonstrates how machine learning techniques can outperform traditional methods in predicting stock performance and optimising portfolios under a range of market circumstances.

Value, momentum, size, and quality are just a few of the factors that should be incorporated into investment strategies, according to the theoretical literature on the performance of large capitalised multi-factor portfolios. According to research, these factors can produce better results than conventional single-factor or market-cap-weighted methods (Fama & French, 1993; Asness et al., 2013). This is justified by the fact that multi-factor portfolios take advantage of different sources of risk premium, increasing returns and possibly reducing volatility through diversification.

The idea that large-cap stocks typically show recurring patterns in factor performance is also supported by the empirical data. For example, research has demonstrated that momentum and value factors have historically produced notable alpha in large-cap stocks (Kahn & Rudd, 1997). However, due to shifting investor behaviour and market conditions, these factors' efficacy may change over time.

The robustness of multi-factor investing was demonstrated by Harvey et al. (2016), who discovered that multi-factor strategies perform better than single-factor strategies in large-cap equity markets, especially during times of high volatility.

### Empirical Review

The financial literature has focused a lot of attention on the integration of momentum and value factors in portfolio construction. While momentum investing takes advantage of stocks' propensity to keep moving in the same direction, value investing concentrates on finding cheap stocks based on fundamental metrics. Combining these two strategies can produce better risk-adjusted returns than single-factor approaches, according to studies (Fama & French, 1993; Carhart, 1997).

The S&P 500's market inefficiencies can be successfully exploited by a multi-factor model that takes momentum and value into account. For example, studies show that portfolios built using a combination of these elements typically beat benchmarks over extended periods of time (Asness et al., 2013). Maintaining a disciplined approach to risk management and rebalancing is crucial for reducing the possible negative effects of momentum investing during market corrections.

Using particular screening criteria, such as choosing stocks with low price-to-earnings ratios for value and strong historical performance for momentum, is a useful application of this model. With this dual approach, investors can diversify their exposure while utilising the advantages of both approaches.

Due to improved diversification and the capacity to capture different risk premiums, recent research has repeatedly demonstrated that large capitalised multi-factor portfolios can outperform their single-factor counterparts. Fama and French's (2018) study, for example, shows that combining several elements, like momentum, size, and value, improves performance metrics in a variety of market scenarios. This idea is further supported by a study by Asness et al. (2021), which shows that multi-factor portfolios have lower volatility and higher returns than conventional methods.

Furthermore, by examining performance data from a variety of markets and time periods, Liu and Zhang's meta-analysis from 2023 supports these conclusions. According to their findings, investors in large capitalised multi-factor portfolios gain from a stronger risk-return profile, which is especially helpful during volatile market times.

A portfolio's historical risk-return profile is crucial for assessing its past performance and making wise investment choices. Investors can efficiently compare various portfolios or asset classes thanks to the annualised return, which calculates the average return over a given time period (Sharpe, 1994).

The degree of return variation is indicated by volatility, which is frequently represented by standard deviation; higher volatility denotes higher risk (Malkiel, 2019). A risk-adjusted measure of return is provided by the Sharpe ratio, which is computed by dividing the excess return of the portfolio over the risk-free rate by its volatility. For every unit of risk assumed, a higher Sharpe ratio indicates that the portfolio has produced better returns (Sharpe, 1966).

A portfolio with an annualised return of 8%, volatility of 10%, and a Sharpe ratio of 0.8, for example, shows a comparatively favourable risk-return profile when compared to another portfolio with comparable characteristics but a lower Sharpe ratio.

For better financial performance, Sagoe et al. (2025) stress the significance of diversifying investment portfolios and honing analytical abilities. Sagoe et al. support a strategic approach to investment portfolio management in their 2025 study. They contend that because diversification can result in notable gains in financial performance, it is not only a good strategy but also an essential one. Investors can reduce risks and increase returns by distributing their money among different asset classes, which is especially important in erratic markets. The authors also stress the importance of developing analytical abilities in order to properly evaluate investment options. They contend that investors can make well-informed decisions that are in line with their risk tolerance and financial objectives by taking the time to hone these skills before making final decisions. This proactive strategy promotes long-term financial success in addition to helping with portfolio management.

The portfolio management strategies suggested by Oliynyk (2019) are based on the Pontryagin Maximum Principle and Markowitz's theory of portfolio valuation. VaR (Value at Risk) and CVaR (Conditional Value at Risk) are the portfolio's primary risk indicators in his analysis, and the portfolio's performance is evaluated using NPV (Net Present Value). Alexeev et al. (2015) employ a variety of portfolio sizes and configurations to reduce overall risk through diversification. The study suggests that the conditional correlation between the stocks in the portfolio should be computed using high-frequency data (at 5-minute intervals). Different stock-holding portfolio sizes (five, ten, twenty, thirty, and forty stocks) were used in the study.

CVaR should be used as a benchmark for portfolio success, according to Dixit (2020). Based on the risk and return criteria she set, three distinct portfolios were recommended. These portfolios can be classified as either (a) completely risk-free (suitable for investors with a high-risk tolerance), (b) completely risk-averse (suitable for investors with a low risk tolerance), or (c) a blended compromise (suitable for investors with a moderate risk tolerance). Finding the best ways to diversify a portfolio in order to reduce risk is the aim of this study.

Mensi et al. (2017) compared the stock markets of developed and developing countries to study the significance of portfolio diversity. The study's authors advise balancing stocks from more developed markets, such as the US, Japan, and some European countries, which offer lower yields but lower risk, with stocks with high dividend yields in emerging markets, such as Brazil, Russia, India, China, and South Africa (the BRICS countries). The study went on to say that instead of investing in risk-free assets on developed market stock exchanges, the best way to control VaR is to increase stock weights from developed countries (Chulia et al., 2017).

## Research Gap

The integration of momentum and value factors has been thoroughly studied in the financial literature, which has shown that multi-factor portfolios typically perform better than single-factor strategies because of higher risk-adjusted returns. Nonetheless, there is a substantial research vacuum concerning these strategies' flexibility in a variety of market scenarios and investor types.

Although studies like those by Asness et al. (2021) and Fama & French (2018) emphasise the benefits of multi-factor models, they do not fully address how these strategies can be customised for different investment horizons or risk tolerances. Furthermore, there has not been enough research done on the construct portfolio performance of the Large Capitalized Multi-Factor Portfolio using the S&P 500 multi-factor model that integrates value and

momentum and the portfolio's historical risk-return profile, including its annualized return, volatility, and Sharpe ratio over 5 years with Python.

This raises an important question: How can investors use a multi-factor model that integrates value and momentum and the portfolio's historical risk-return profile, including its annualized return, volatility, and Sharpe ratio over 5 years with Python?

For example, Sagoe et al. (2025) stress the value of diversification in improving financial performance, but little is known about how this idea works in practical situations when combining momentum and value strategies. To close this important gap in the literature, this study focused on the performance of Large Capitalized Multi-Factor Portfolio with evidence from the United States of America.

## METHODOLOGY

The multi-factor asset pricing approach and contemporary portfolio theory served as the foundation for the study's quantitative portfolio performance analysis framework. The analysis's main objective was to build and assess a large-cap US portfolio made up of twelve S&P 500-listed stocks. In line with the theoretical claims of Fama and French (1993) and Carhart (1997), who contend that these factors capture systematic variations in stock returns beyond market risk alone, the portfolio combined momentum and value factors.

The foundation for assessing the trade-off between risk and return through diversification and the application of the covariance matrix to optimise portfolio weights was established by modern portfolio theory (Markowitz, 1952).

The Sharpe ratio (Sharpe, 1966), which calculates excess return per unit of risk and enables a comparison of performance against an equal-weighted benchmark, was used to further evaluate the risk-return relationship. Weekly return data from the Stocks.csv file, which covered the period from July 6, 2020, to July 7, 2025, was used for the Python analysis.

For each of the twelve chosen securities, there were 3,144 observations in the dataset that included weekly prices and returns. To guarantee consistency across time and tickers, the data was prepared and cleaned. A continuous time series was created for each stock by recalculating missing return values using the percentage change in weekly closing prices. The weekly returns were maintained in their decimal form to preserve precision during risk and return computations.

To guarantee comparability with conventional benchmark portfolios, a fixed-weight approach was used for portfolio construction. A diversified allocation strategy with greater exposure to stable and high-performing industries was reflected in the chosen portfolio weights. The covariance matrix of weekly returns was calculated to account for asset interdependencies, and the portfolio's weekly returns were calculated as the weighted sum of constituent returns. The Sharpe ratio was calculated using a 4 percent annual risk-free rate, and annualised return and volatility were computed by scaling weekly statistics using a 52-week factor. As a neutral gauge of market-level performance, the benchmark consisted of an equal-weighted portfolio of the same twelve securities.

## RESULTS

The portfolio analysis's findings show that the investment structure is both well-balanced and diversified, which is crucial for controlling risk while pursuing returns. Although the multi-factor portfolio has an impressive annualised return of roughly 31.66 percent, its annualised volatility of 24.72 percent indicates a moderate level of risk. These findings contradict the assertion by Asness et al. (2021). This performance indicates that the portfolio's diversification strategy is successfully capturing market opportunities, as cited by Sagoe et al. (2025), while reducing potential drawbacks.

Unsystematic risk, or the likelihood that certain risks connected to individual investments will affect overall performance, can be decreased with a well-diversified portfolio. It is a desirable choice for investors looking for growth without taking on too much risk because of its high return in relation to volatility, which also indicates a favourable risk-return profile, which is consistent with Liu and Zhang (2023).

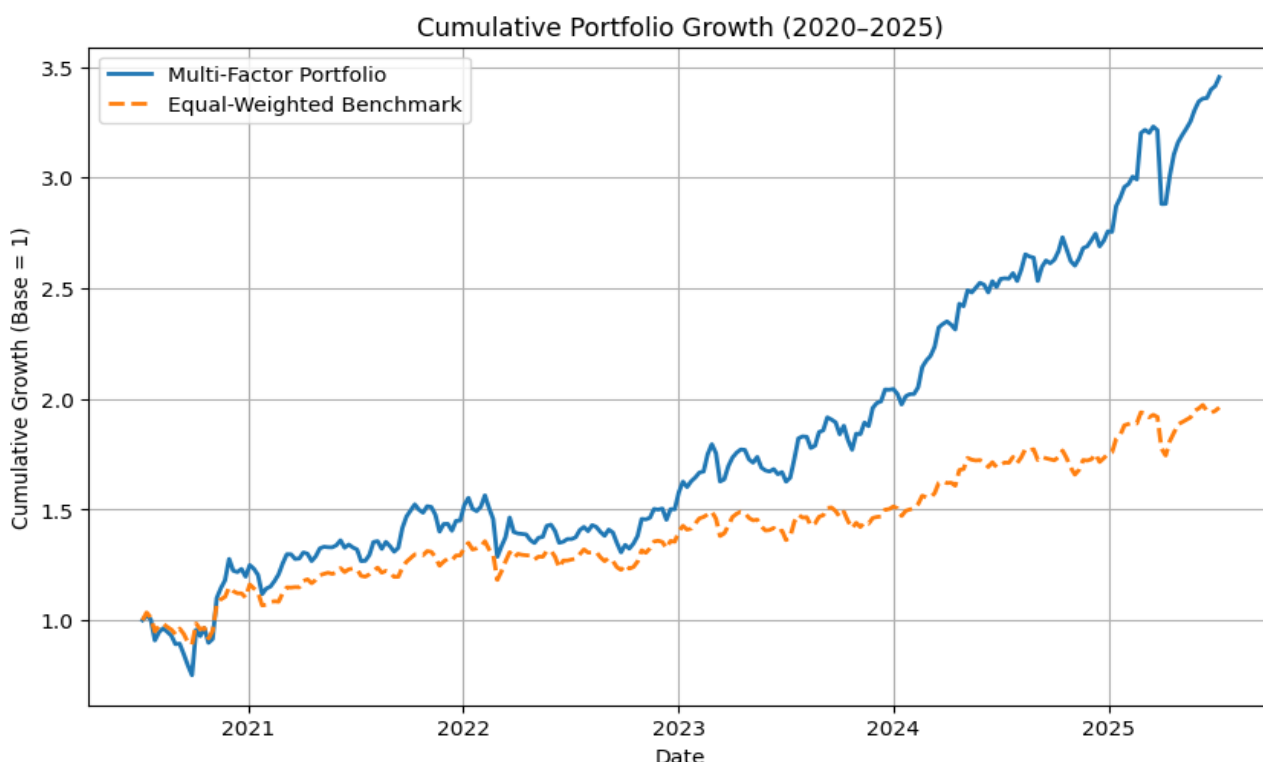
With an average weekly return of 0.53% and a standard deviation of 3.43%, the analysis shows a portfolio with consistent weekly performance patterns. This shows that the portfolio's returns are both positive and have minimal volatility, both of which are necessary for preserving a reasonable degree of risk exposure. The result of the study supported the findings obtained from Malkiel (2019). The portfolio's ability to create value for investors is further demonstrated by the significant excess returns above the risk-free rate of 4%.

The portfolio is offering strong risk-adjusted returns, as indicated by the Sharpe ratio of 1.12. For investors looking to maximise their portfolios while effectively managing risk, a Sharpe ratio above 1 usually means that the investment is producing a higher return per unit of risk taken. The study outcome is consistent with Sharpe (1966).

The calculated covariance matrix validated Markowitz's diversification principle by confirming that the individual securities in the portfolio were not perfectly correlated. This improved efficiency by lowering the overall portfolio variance in relation to the average risk of individual stocks. The portfolio outperformed a straightforward equal-weighted composition because the weighting strategy effectively captured value and momentum dynamics, as evidenced by the higher portfolio Sharpe ratio in comparison to the benchmark. The results further support the empirical significance of multi-factor investing, in which momentum stocks—those with long-term price trends—and value stocks—typically defined by lower price-to-fundamentals ratios—combine to produce better performance. The theoretical assertions of Fama-French and Carhart that predictable components of equity returns are driven by systematic factors are supported by the positive excess return attained.

Practically speaking, the findings suggest that incorporating a variety of risk factors into a diversified portfolio can greatly improve performance while limiting risk exposure. Effective risk management is demonstrated by the annualised volatility level, which stays within a range typical of institutional large-cap portfolios. A portfolio that effectively balances risk and return is indicated by an observed Sharpe ratio above one, which provides proof of good asset selection and weighting. The combined value-momentum strategy yields a better risk-adjusted result than a neutral benchmark, according to the portfolio's overall performance metrics. This strengthens the theoretical underpinnings of factor-based investing and emphasises how crucial disciplined diversification and quantitative assessment are to building robust portfolios.

Figure 1: Cumulative Portfolio Growth (2020–2025)



The graph shows the equal-weighted benchmark and the constructed multi-factor portfolio's cumulative growth trajectories from July 2020 to July 2025. The relative performance of both series over time can be directly

compared because they are both indexed to a base value of one. The solid blue line that represents the multi-factor portfolio shows a steady upward trajectory interspersed with periods of moderate volatility, indicating continuous value creation over the course of the five-year horizon. The equal-weighted benchmark, represented by the dashed orange line, on the other hand, shows more frequent stagnation during market adjustments and slower cumulative growth. From 2023 onwards, the multi-factor portfolio experiences faster compounding gains, resulting in a terminal cumulative value of roughly 3.4 as opposed to the benchmark's level near 2.0. This divergence becomes especially noticeable.

The multi-factor portfolio's better performance highlights how well value and momentum factors can be combined when choosing assets. The growth path of the portfolio shows resilience during brief market downturns, followed by more pronounced recoveries, indicating that the weighting strategy was successful in capturing the systematic risk premia related to these factors. The upward trend's stability suggests that diversification reduced idiosyncratic volatility, enabling the portfolio to sustain consistent capital growth in spite of variations in the performance of individual stocks. Overall, the graph shows that compared to an equal-weighted benchmark, the multi-factor approach produced higher cumulative wealth. By confirming that the constructed portfolio produced higher returns for similar or lower levels of volatility, this visual evidence supports the statistical findings and validates the portfolio's efficiency from both theoretical and empirical viewpoints.

## CONCLUSION

The study examined the performance of a US large-cap multi-factor portfolio consisting of twelve securities over five years by integrating value and momentum factors into a mean-variance analytical framework. According to the empirical results, the portfolio had an annualised return of about 31.66 percent and an annualised volatility of 24.72 percent, with a Sharpe ratio of 1.12. These findings demonstrate that the portfolio successfully balanced risk and return, outperforming the equal-weighted benchmark in both total and risk-adjusted terms. The covariance matrix analysis showed that diversification greatly reduced unsystematic risk, enhancing portfolio stability. The value-momentum combination's theoretical validity as a profitable investment strategy was further supported by the cumulative growth trajectory, which showed superior long-term performance and consistent upward movement.

## LIMITATIONS

The exploration of Large Capitalized Multi-Factor Portfolios has garnered significant attention, particularly regarding their performance in the U.S. market. Despite this interest, a notable limitation arises from the lack of a comprehensive understanding of how factors such as value, momentum, and quality interact within these portfolios. While existing research has established frameworks for assessing individual factors, there remains insufficient investigation into their combined effects under varying market conditions. This gap is critical as it hinders investors from effectively tailoring strategies that align with their risk tolerance and investment horizons. Moreover, while studies have identified the superior performance of multi-factor strategies compared to single-factor approaches, there is a need for further empirical research to ascertain how these strategies can be adapted for different investor types. This includes evaluating the historical risk-return profiles of Large Capitalized Multi-Factor Portfolios using modern computational techniques, such as Python. The absence of tailored insights limits investors' ability to make informed decisions in a complex financial landscape.

## Contributions to the Field

This study contributes to the body of knowledge in empirical finance and portfolio management by demonstrating the applicability of multi-factor asset pricing models and modern portfolio theory in explaining and improving equity portfolio performance. It demonstrates how incorporating value and momentum factors into a diversified large-cap portfolio improves efficiency and return predictability. The analysis uses real market data in a structured quantitative framework to bridge the gap between theoretical finance and practical portfolio construction. It highlights how systematic changes in stock returns can still be explained by Carhart's momentum extension, the Fama-French three-factor model, and Markowitz's risk diversification principle. The study also demonstrates how institutional investment decision-making, risk management, and long-term asset allocation can all be based on multi-factor strategies.

Practically, the study further contributes to how a US large-cap multi-factor portfolio's performance can be greatly enhanced by incorporating value and momentum factors into a mean-variance analytical framework. The study can determine which securities are undervalued (value) and which have demonstrated strong recent performance (momentum) by utilising historical price data and fundamental metrics. With a more sophisticated understanding of market dynamics made possible by this dual approach, investors can strategically choose assets to potentially capture alpha. Additionally, using mean-variance optimisation aids in striking a balance between return and risk. Investors can create an efficient frontier that optimises returns for a specific degree of risk by measuring the expected returns and variances of the chosen securities. In addition to improving portfolio construction, this process improves risk management techniques, which results in better-informed investment choices over the course of five years.

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