BSAMC
Bocconi Students Asset Management Club

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EQUITY AND FIXED INCOME FUND

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Fund description

Long Short Fund of Bocconi Students Asset Management Club is a dynamic investment vehicle that commenced operations in October 2023 employing a Long Short strategy. This fund specializes in US Equity assets while strategically integrating other assets for diversification and mitigating risk. With a focus on delivering consistent returns through all market conditions, the fund operates within a five-month reporting cycle, analyzing performance, and adapting strategies accordingly.

Investment Approach

By employing a rigorous and disciplined investment approach encompassing fundamental, quantitative, and event-driven analysis, supplemented by sector and theme analysis, the fund aims to identify attractive long and short opportunities that can generate alpha and enhance overall portfolio performance. The fund uses a combination of analysis to select opportunities for investment. The potential investment opportunity must qualify at least 2 of these parameters to be considered as a long or short position in the portfolio.

Fundamental Analysis

The fund conducts thorough fundamental analysis of individual companies to assess their financial health, growth prospects, competitive positioni ng, and management quality. For long positions, companies exhibiting strong fundamentals, such as earnings growth projections, strong balance sheets, and competitive advantages, are considered as investment opportunities. Similarly, for short positions, companies with deteriorating fundamentals, weak competitive positioning, or questionable management practices are identified as potential candidates for short selling.

Quantitative Analysis

Quantitative models are utilized to identify potential long and short opportunities based on various financial metrics, including valuation ratios, earnings momentum, and profitability measures. These models help to identify securities for overvalued or undervalued, by quantitatively assessing their relative attractiveness within the market.

Event-Driven Opportunities

The fund actively seeks event-driven opportunities, such as mergers and acquisitions, corporate restructurings, earnings announcements, and regulatory developments. Event-driven analysis helps to identify catalysts that could drive significant price movements in individual equities, providing opportunities for both long and short positions based on the anticipated impact of these events.

Sector and Theme Analysis

Sector and thematic analysis are integral parts of the investment approach, allowing the fund to capitalize on emerging trends and industry-specific dynamics. By identifying sectors or themes poised for outperformance or underperformance, the fund can overweight or underweight specific industries in its long and short positions, respectively.

ESG Integration

The fund incorporates Environmental, Social, and Governance (ESG) factors into its investment approach to assess the sustainability and responsible business practices of potential investments. Utilizing tools ESG Rankings, companies are evaluated based on their performance in key ESG criteria, such as environmental impact, social responsibility, and corporate governance. Companies with strong ESG profiles are favored for long positions, aligning with the fund's commitment to investing in sustainable businesses. By incorporating ESG factors into the investment process, the fund aims to enhance risk-adjusted returns, promote sustainable investing practices, and contribute to positive societal and environmental outcomes.

Macroeconomic Overview

In Q4-2023, the global economy shrank because of persistent geopolitical tensions, worries about inflation, and tighter monetary policy. Global growth is expected to slow to 2.9% in 2024 from 3% in 2023, according to prominent institutions like the IMF.

In May and July of 2023, the Fed raised interest rates by 25 basis points, marking the 11th rate hike in a cycle intended to reduce excessive inflation, in September and November, the rate was left unchanged, putting the benchmark rate to a range of 5.25% to 5.5%. It is anticipated that rates would rise steadily in 2024.
In Q4 2023, U.S. inflation remained stable; the Consumer Price Index (CPI) reduced in June at 3% before showing a slight increase to 3.7% in September. With volatile food and energy costs excluded, the core CPI was 4% in November. In 2023, the S&P jumped 24.23%, the Dow gained 13.8% and the Nasdaq rocketed 43.42%. The market fell in the third quarter while the S&P 500 fell by -3.3%, but the year-to-date gain is still +13.1% following a gain of +16.9% in the first half of 2023. The market fell by -6% through the conclusion of the quarter after hitting its annual high on July 31.

Other Key Regions:

The sequence of rate hikes by the European Central Bank (ECB) began in July 2022 and reached its highest point since the global financial crisis of 2007 and 2008 as of December 2023, at 4.5%. December saw a 2.9% year-over-year increase in eurozone inflation, below the 3% forecast, bringing a halt to a seven-month downward trend. The rate of inflation rose by 0.2% per month. Core inflation reached 3.4%, omitting food and energy. The PPI decreased by 0.3% in November, marking a noteworthy annual decline of 8.8%. The European Union's inflation rate is at 3.4% as of December 2023. COVID-19 lockdowns and a slowdown in the real estate market caused China's growth, which is a major engine of Asian economies, to slow down in 2023. In contrast to other regions, China's inflation rate stayed under control.

Other Crucial Elements**:**

Geopolitical tensions: The conflict in Ukraine is still going strong, which is causing supply chains all around the world to break and pushing inflation higher.
Disruptions to the supply chain: Extended supply chain backlogs continue to affect a number of

industries, driving increasing input costs and perhaps affecting the state of the economy as a whole.

Labor market: While there are robust labor markets in many areas, concerns about wage growth increase the danger of inflation.

Oil Prices: In a turbulent year of trading characterized by geopolitical unrest and worries over the oil output levels of major producers worldwide, crude futures saw a loss of nearly 10% in 2023.

Portfolio Allocation

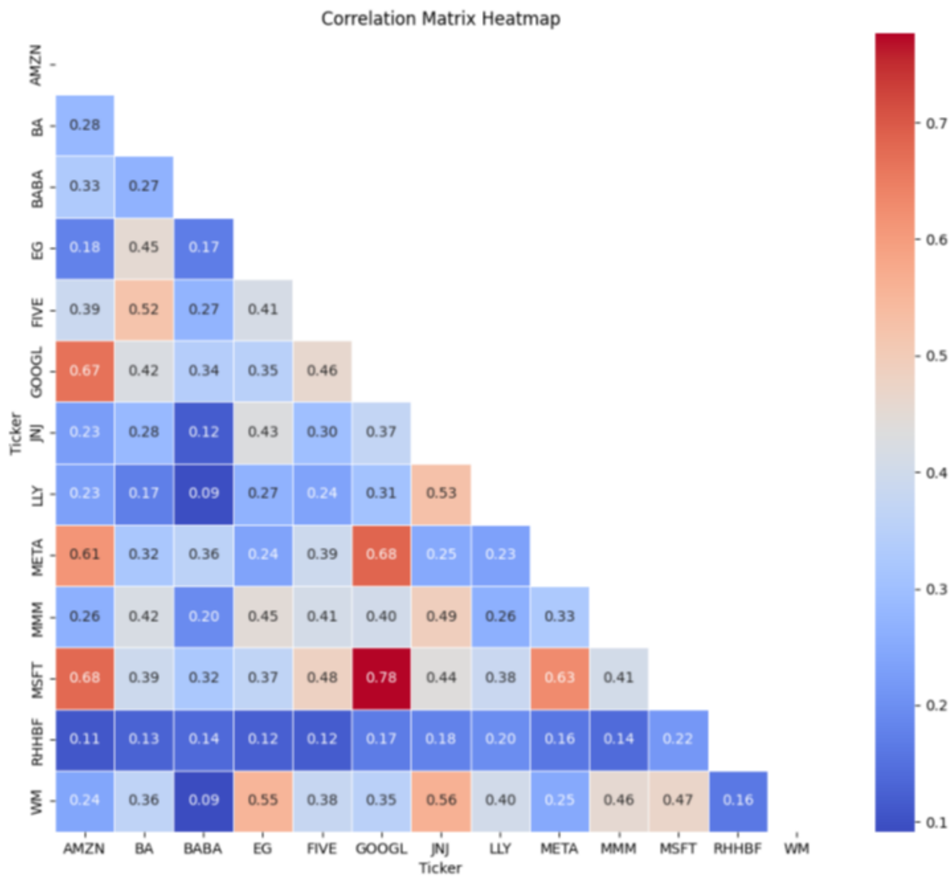
Correlation analysis

In the evolving landscape of financial investments, portfolio optimization stands as a cornerstone of investment strategies, aiming to maximize returns while mitigating risk. The advent of modern portfolio theory has equipped investors with quantitative tools to analyze and optimize their asset allocations.

We delve into the empirical analysis of a set of diversified assets, comprising a range of tickers from technology giants to healthcare leaders. Through the lens of historical data and statistical correlation, we endeavor to decipher the subtleties of market movements and their implications on portfolio synergy.

The correlation matrix heatmap of the portfolio's tickers provides insightful information for portfolio optimization. A key observation from the heatmap is the high positive correlation between some stocks, notably within the technology sector. For instance, Microsoft (MSFT) exhibits a strong positive correlation with Alphabet (GOOGL) at 0.78, implying that their stock prices tend to move in the same direction. Such correlations are common among stocks within the same sector due to shared market and economic influences.

Conversely, some pairs of stocks demonstrate low or negligible correlations. For example, Microsoft (MSFT) and Roche Holding (RHHBF) have a correlation coefficient of 0.11, suggesting a very weak positive relationship. This lack of correlation can be beneficial for diversification purposes, as it may reduce overall portfolio volatility. For effective portfolio allocation, an ideal mix of assets with low correlations is preferred. This strategy can potentially minimize risk by ensuring that not all assets are likely to decrease in value simultaneously. The goal is to combine assets in a manner that maximizes returns while minimizing risk, in accordance with the Modern Portfolio Theory.



In the pursuit of constructing an optimized investment portfolio, we employed the Efficient Frontier framework—a concept rooted in the Modern Portfolio Theory. The expected annual returns of each asset were computed using the mean historical return method. With these inputs, we instantiated an Efficient Frontier object and proceeded to optimize the asset allocation for the maximum Sharpe ratio. The Sharpe ratio is a measure of risk-adjusted return, and by maximizing it, we aimed to achieve the best possible return for a given level of risk.

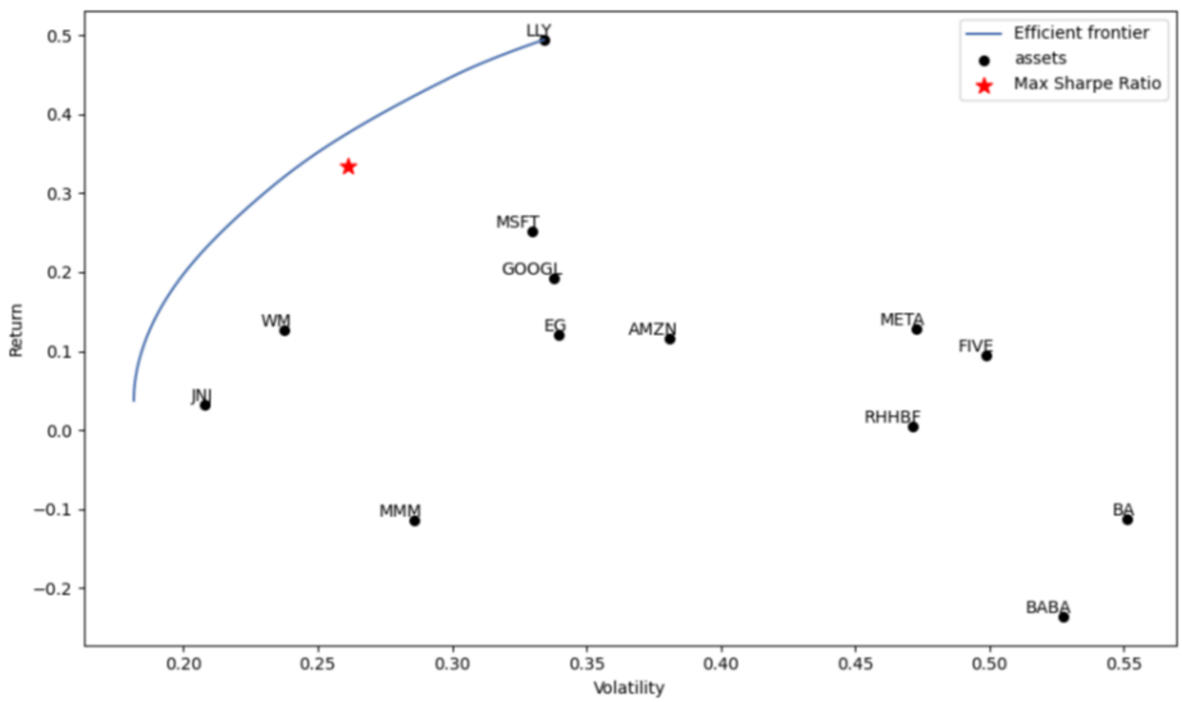
To accommodate practical considerations, we imposed constraints on the portfolio weights, ensuring a minimum allocation of 3% and a maximum of 65% per position and not necessarily per asset class. These constraints reflect a realistic investment scenario where a minimal level of diversification is maintained, and over-concentration in a single asset is avoided. Upon optimization, the portfolio weights were determined, and the resulting allocation is as follows: Eli Lilly and Co. (LLY) create 65% as the per position limit (maximum), while all other assets were assigned the minimum threshold of 3%.

The optimized portfolio boasts an expected annual return of 33.4%, with an annual volatility of

26.1%. The resultant Sharpe ratio of 1.20 indicates a favorable risk-adjusted return profile. This performance epitomizes a well-calibrated trade-off between risk and return, aligning with the investment club's strategic objective of maximizing return per unit of risk.

Efficient Frontier Analysis

The below figure presents the Efficient Frontier derived from the portfolio optimization process. The individual assets are represented as black dots, each marked with the corresponding ticker symbol, signifying their respective risk (volatility) and expected return. At the heart of the graph lies the red star, which indicates the portfolio with the maximum Sharpe Ratio. This optimal point on the Efficient Frontier represents the most favorable risk-adjusted return profile, guiding investors toward the most efficient allocation of resources.



Asset Allocation Strategy

The asset allocation strategy for the portfolio was executed with a bifurcated approach, dividing the capital between equities and fixed-income instruments. The portfolio was structured with an

80-20 split, allocating 80% of the capital to stocks and the remaining 20% to fixed-income securities, adhering to a traditional balanced portfolio approach.

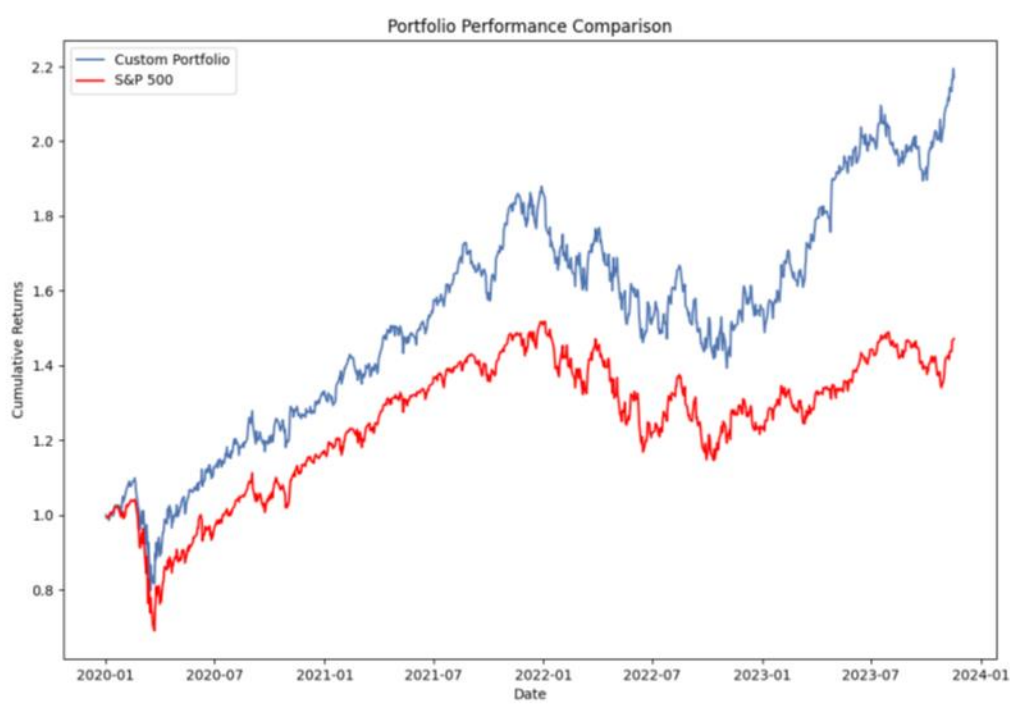
The equity portion underwent a discrete allocation process where the previously optimized weights were applied to determine the number of shares for each stock, given the equity budget. This process was guided by the latest available prices and aimed to maximize the utilization of the budget dedicated to stocks.

For the fixed-income component, the allocation was equally divided among the selected tickers, thereby simplifying the process and ensuring diversification within the fixed-income portion of the portfolio. This resulted in the purchase of 105 units of AGG and 1075 units of VBTLX. After the allocation, the fixed-income budget had a residual of $58.30.

Discrete Allocation Summary		
Portfolio Component	Allocation	Remaining Funds
Stocks	80%	$35.38
Fixed Income	20%	$58.30
Total	100%	$93.67

Performance

An ex-post analysis was conducted to assess the performance of our custom portfolio relative to the S&P 500, a benchmark index representing the U.S. equities market. The comparative analysis, depicted in Figure 3, charts the cumulative returns over a period extending from January 2020 to November 2023. Observations from the graph indicate that the custom portfolio, despite commencing investment in the last quarter of 2023, exhibits a trajectory that is at times parallel, and occasionally divergent, from that of the S&P 500. The analysis suggests that the custom portfolio's returns fluctuate in response to market dynamics, yet the overall trend demonstrates resilience and potential for growth.



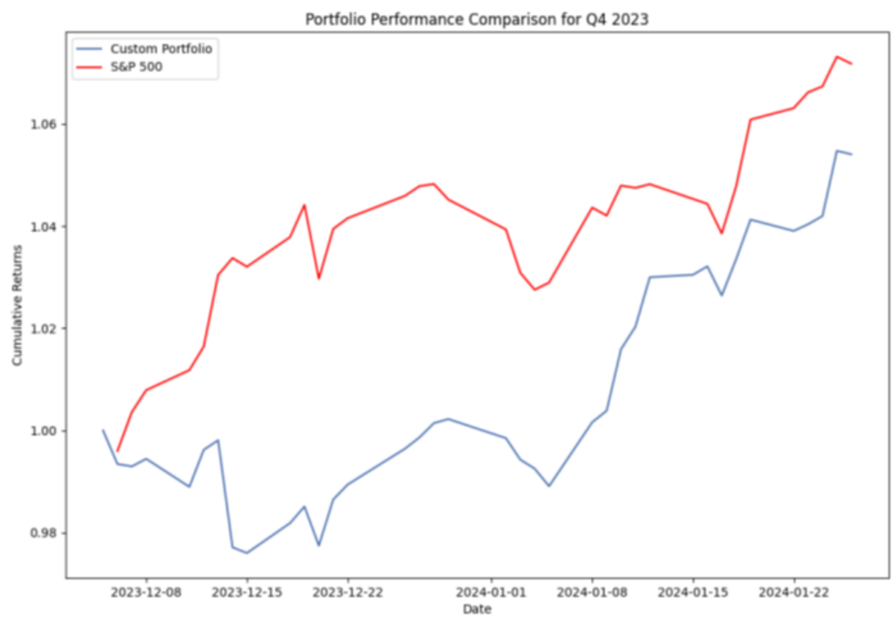
The table below provides a detailed view of the asset allocation within the portfolio. It includes both long and short positions, with negative quantities indicating short sales. Long positions are held in anticipation of a price increase, whereas short positions are expected to benefit from a price decline. The total cost and percentage columns reflect the weight of each position in the context of the overall portfolio.

Symbol	Trade Date	Purchase Price	Quantity	Total Cost	Percentage
HAS	02/10/23	57.38	-25	-1434.50	-1.76%
EBAY	02/10/23	48.33	-25	-1208.25	-1.49%
HRL	02/10/23	37.54	-100	-3754.00	-4.62%
BMY	02/10/23	57.85	-100	-5785.00	-7.12%
HSY	02/10/23	200.17	-25	-5004.25	-6.16%
GC=F	02/10/23	1826.7	5	9133.50	11.24%
VBTLX	02/10/23	9.11	1075	9793.25	12.05%
AGG	02/10/23	93.13	104	9685.52	11.91%
RHHBF	02/10/23	292.5	8	2340.00	2.88%
JNJ	02/10/23	153.32	16	2453.12	3.02%
WM	02/10/23	150.31	14	2104.34	2.59%
META	02/10/23	301.63	7	2111.41	2.60%
FIVE	02/10/23	156.85	13	2039.05	2.51%
EG	02/10/23	369.19	6	2215.14	2.72%
BA	02/10/23	186.93	12	2243.16	2.76%
MMM	02/10/23	89.31	25	2232.75	2.75%
LLY	02/10/23	526.81	87	45832.47	56.38%
MSFT	02/10/23	315.18	6	1891.08	2.33%
GOOG	02/10/23	132.07	18	2377.26	2.92%
AMZN	02/10/23	126.54	16	2024.64	2.49%

Table 2: Portfolio positions as of the last trading update.

As the year 2023 ended, a critical evaluation of our investment strategy was conducted, focusing on the performance during the last quarter.

During this quarter, the custom portfolio exhibited fluctuations in performance, with cumulative 4 returns occasionally surpassing and at times underperforming relative to the S&P 500. Notably, the custom portfolio's cumulative returns concluded the quarter below those of the S&P 500, suggesting a period of underperformance. Such outcomes underscore the inherent uncertainties of the market and the potential for short-term deviations from expected trends.



Risk Management

α analysis

The formula for calculating the Alpha of a risky portfolio involves the difference between the actual portfolio return and the expected return given the systematic risk. Alpha represents the ability of an investment manager to generate returns that are higher or lower than expected based on market risk.

The general formula for calculating the Alpha of a risky portfolio is as follows:

Portfolio Risk Alpha =
Actual Portfolio Return− (Risk-Free Rate+ β × (Market Return−Risk-Free Rate)

Where:

- Actual Portfolio Return is the actual return of the portfolio.
- Risk-Free Rate is the risk-free rate of return, often associated with short-term government securities.
- β is the beta coefficient of the portfolio, measuring the sensitivity of the portfolio to market fluctuations.
- Market Return is the average return of a representative market index.

1-month α	**-1.4%**
3 months α	**+2.86%**

6 months α	**+14.32%**
1-year α	**+23.64%**

- 1-month alpha of **-1.4%** shows that Portfolio generated **no excess** returns adjusting for beta (volatility) & risk-free rate. S&P 500 (market benchmark) returned **+4.2%** in the 1-month period as compared to the portfolio which returned **+1.6%.** Calculation used a Portfolio Beta of 0.69
- 3-month alpha of **+2.9%** shows that Portfolio generated **some excess** returns adjusting for beta (volatility) & risk-free rate. S&P 500 (market benchmark) returned **+1.9%** in the 3-month period as compared to the portfolio which returned **+4.7%.** Calculation used a Portfolio Beta of 0.97
- 6-month alpha of **+14.3%** shows that Portfolio generated **significant excess** returns adjusting for beta (volatility) & risk-free rate. S&P 500 (market benchmark) returned **+6.2%** in the 6-month period as compared to the portfolio which returned **+19.2%.** Calculation used a Portfolio Beta of 0.69
- 1-year alpha of **+23.6%** shows that Portfolio generated **significant excess** returns adjusting for beta (volatility) &risk-free rate. S&P 500 (market benchmark) returned **+15.6%** in the 1-year period as compared to the portfolio which returned **+33.5%.** Calculation used a Portfolio Beta of 0.50.

β analysis

The beta (β) of a portfolio measures its sensitivity to market movements. It is calculated using the following formula:

$$\beta = \frac{Covariance\,(Portfolio\ Returns, Market\ Returns)}{Variance(Market\ Returns)}$$

Where:

- Covariance (Portfolio Returns, Market Returns) is the covariance between the returns of the portfolio and the market. It measures how the returns of the portfolio move in relation to the market returns.
- Variance (Market Returns) is the variance of the market returns. It measures the degree of dispersion of market returns around their mean.

In simpler terms, beta quantifies the portfolio's volatility in relation to the overall market. A beta greater than 1 indicates higher volatility than the market, while a beta less than 1 indicates lower volatility.

1-month β	**0.69**
3 months β	**0.97**

6 months β	**0.70**
1-year β	**0.50**

- 1-month Portfolio beta (0.69) has **lower** volatility than the market. S&P 500 (market benchmark) returned **+4.2%** in the 1-month period as compared to the portfolio which returned **+1.6%.** Portfolio underperformed market while taking on less relative volatility.
- *3-month Portfolio beta (0.97) indicates volatility like the market. S&P 500 (market benchmark) returned* **+1.9%** in the 3-month period as compared to the portfolio which returned **+4.7%.** Portfolio outperformed market while taking on similar relative volatility. The **most** relatively volatile constituent was *[AMZN] Amazon.com, Inc.*
- *6-month Portfolio beta (0.7) has* **lower** volatility than the market. S&P 500 (market benchmark) returned **+6.2%** in the 6-month period as compared to the portfolio which returned **+19.2%.** Portfolio significantly outperformed market while taking on less relative volatility. The **most** relatively volatile constituent was *[AMZN] Amazon.com, Inc.*
- *1-year Portfolio beta (0.5) has* **lower** volatility than the market. S&P 500 (market benchmark) returned **+15.6%** in the 1-year period as compared to the portfolio which returned **+33.5%.** Portfolio significantly outperformed market while taking on less relative volatility. The **most** relatively volatile constituent was *[AMZN] Amazon.com, Inc.*

Improvements for upcoming Quarters

Improved Screening Method: The fund wants to improve the methodical screening it uses to approve assets for the portfolio. This entails adding more stringent standards, like thorough financial analysis, more profound ESG integration, and exacting risk assessment, to the process of assessing possible investments. The fund aims to maximize portfolio performance and raise the caliber of investment decisions by strengthening the screening procedure.

Increased ESG Component Weight: Acknowledging the growing significance of environmental, social, and governance factors, the fund plans to raise the ESG component's weight in the overall composition of the portfolio. This modification demonstrates our dedication to sustainable investment ideas and bringing the portfolio into compliance with ESG best practices.

Preserving the 130-30 Approach: Although the fund's original objective was a 130-30 strategy, the ratio of short to long positions has changed due to market conditions and the overall outlook for the US equity market. In order to maximize risk-adjusted returns, the fund will continue to try to stick to its initial plan while modifying short holdings in response to market conditions.

Focus on Consistent Returns: The principal aim of the fund is to produce steady returns annually, independent of fluctuations in the market. The fund will keep putting a high priority on careful research, rigorous risk management, and strategic asset allocation in order to accomplish this goal. The fund will also look into ways to improve diversity, reduce downside risk, and optimize upside potential.

Ongoing Assessment and Adjustment: Despite a constantly changing market environment, the fund is dedicated to ongoing assessment and adjustment. This entails keeping up with new developments in geopolitics, technology, emerging trends, and regulations that could affect portfolio performance and investment prospects. The fund seeks to effectively navigate problems and seize opportunities by maintaining its agility and proactivity.

In summary, throughout the reporting period, the Long-Short Fund has proven to be resilient and adaptable in navigating the changing financial markets. With the addition of a Long Short strategy and strategic diversification into US equity assets, fixed income ETFs, and gold, the fund has performed admirably even in the face of market volatility.

With an eye toward the future, the fund is dedicated to putting enhancements into place, such as improving the screening procedure, giving ESG factors more weight, and upholding the integrity of its 130-30 strategy. The fund continues to be well-positioned to take advantage of opportunities and manage risks sensibly, all while concentrating on producing steady returns.

Conclusion

The Long Short Fund maintains its commitment to providing value to investors, maintaining the greatest standards of integrity, and favourably influencing the larger financial ecosystem as we move forward with our journey. With our unwavering dedication to quality and creativity as our compass, we look forward to embracing the opportunities and challenges that lie ahead.

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