Goldman Sachs Asset Management

QUANTITATIVE INVESTMENT STRATEGIES

Alpha Enhanced Investing: Top Questions From Our Institutional Clients

An Alpha Enhanced approach to equity investing offers a middle ground between cost-effective passive strategies and the alpha potential of active investing. This unique combination can help institutional investors get more from their equity allocations.

Passive equity strategies have come a long way in recent years, overtaking active funds by assets under management[1] and becoming a staple of investors' core equity allocations. Demand for passive equity strategies has been driven in part by the predictability of strategies built to mirror an index, but investors are coming to realize that this also presents challenges.

By design, index-tracking strategies underperform their benchmarks after fees. They offer limited risk management and lack the mechanisms to manage volatility or adapt to investors' unique goals and preferences. For these reasons, we think passive exposures may not be the most efficient use of portfolio risk budget, especially in the current environment of moderating forward market-return expectations,[2] elevated index concentration risk,[3] and heightened uncertainty around international trade, economic growth and inflation.

Investors are increasingly looking for solutions that provide the alpha potential and robust risk management that active strategies can provide, without sacrificing the transparency and cost effectiveness of passive investing. Alpha Enhanced solutions are designed to bridge this gap. At Goldman Sachs Asset Management, we speak with clients around the world about this approach. Here are our answers to clients' most frequently asked questions.

1. What is Alpha Enhanced investing?

Alpha Enhanced solutions aim to strengthen passive portfolios while maintaining beta exposure. This approach incorporates an alpha-seeking component that is controlled and risk-managed, allowing investors to use their portfolio risk budget more efficiently. The versatility of Alpha Enhanced solutions allows investors to seek alpha, diversify risk, and optimize fee budgets effectively according to their objectives.

2. How does Alpha Enhanced investing work?

Our Alpha Enhanced solutions are designed to perform two key functions. Like passive strategies, they closely track a benchmark index and provide broad market exposure, known as beta. Like active strategies, they deviate from the benchmark, though these deviations are contained within pre-set tracking-error limits. This leeway allows these strategies to take active bets in pursuit of outperformance, or alpha, using a selective, risk-controlled approach.

There is no guarantee that objectives will be met. The portfolio risk management process includes an effort to monitor and manage risk, but does not imply low risk. Diversification does not protect an investor from market risk and does not ensure a profit.

[1] "Global Passive Equity Funds' Assets Eclipsed Active in 2023 for First Time," Reuters. As of February 1, 2024.

[2] Goldman Sachs Global Investment Research. As of October 18, 2024. In a global strategy paper, Goldman Sachs analysts forecast that the S&P 500 would generate a 3% annualized nominal total return through 2034, which ranked in the seventh percentile of 10-year returns since 1930.

[3] See for example: "Why Your S&P 500 Index Fund Might Be More Risky Than the Internet Bubble," Morningstar. As of October 11, 2025.

An Alpha Enhanced strategy's tracking-error budget is set in line with the investor's risk appetite, but tends to fall in a range of 50 to 200 basis points. The added risk gives active managers scope to improve risk-adjusted returns by overweighting or underweighting stocks based on forward-looking views. These active positions tend to be distributed across market caps, sectors and geographies to limit concentration, avoid unintended risk exposures, and maintain a composition that is close to the benchmark. The goal of this approach is to seek alpha stability and consistency while balancing risks.

3. What is the most effective way to implement the Alpha Enhanced approach in an investment portfolio?

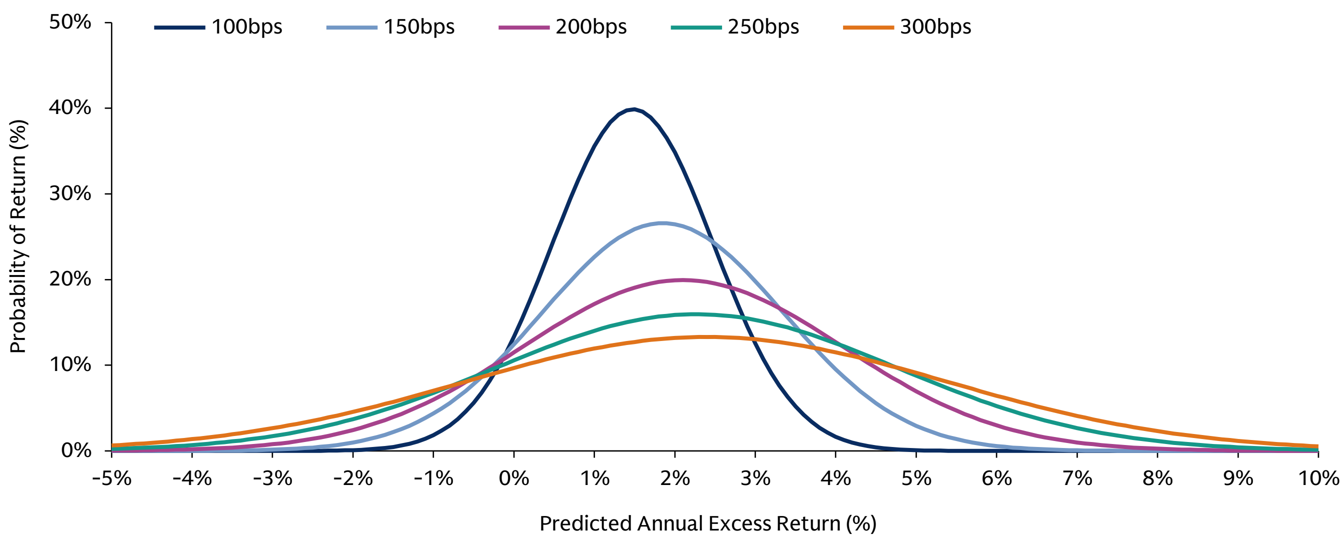
We believe a systematic, data-driven stock selection investment process is the most efficient way to implement Alpha Enhanced solutions, particularly in complex, inherently inefficient markets. This supports a dynamic approach to portfolio management, capable of playing both offensive and defensive roles. A systematic process that is scalable, diversified and differentiated can use risk budgets more efficiently, in the style-pure, transparent manner required in Alpha Enhanced strategies. With institutional investors currently under-allocated to quant strategies, the opportunity to diversify away from fundamentally managed passive investing is particularly compelling.

Historically favored by institutional investors for their low-tracking-error profiles, Alpha Enhanced strategies are increasingly accessible to a broader investor base thanks to the growing scalability of systematic approaches along with advances in portfolio construction that enable granular levels of transparency. These evolutions have expanded availability across vehicles, including separately managed accounts, mutual funds and exchange-traded funds.

4. How do Alpha Enhanced strategies seek to deliver consistent alpha?

By taking smaller bets in a highly risk-controlled manner, Alpha Enhanced strategies focus on the consistency, not the magnitude, of positive performance. As a result, these low-tracking-error strategies may generate positive annualized excess returns versus the benchmark more frequently than strategies with higher tracking error, though the magnitude of these returns will tend to be smaller. In our view, this allows Alpha Enhanced strategies to outperform their passive peers, especially over the longer term thanks to the effects of compounding.

Probability of Expected Return at Various Levels of Tracking Error

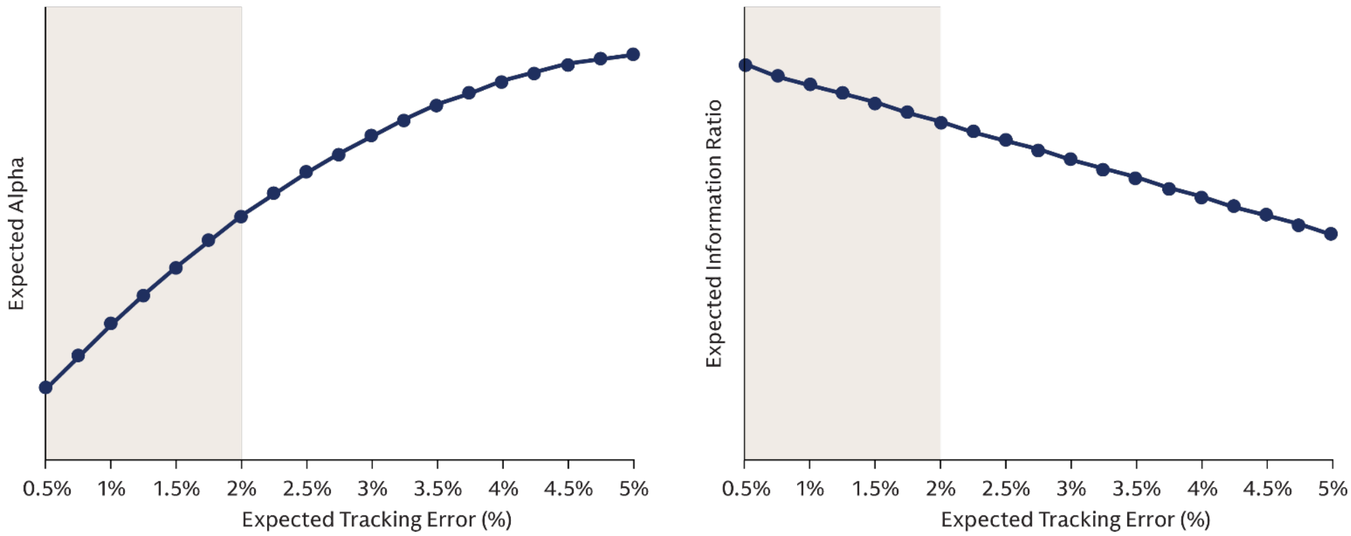


Source: Goldman Sachs Asset Management. For illustrative purposes only. The illustration shows the probability of a portfolio to achieve various levels of annual excess returns for various levels of tracking error. For instance, while a portfolio with 100 bps of tracking error (in dark blue) may have an average predicted annual excess return that is lower than one with 200 bps of tracking error (in green) – seen in the horizontal midpoint of each respective bell curve, the probability of achieving that return is higher for the 100 bps portfolio – seen in the vertical height of each bell curve. Withal, a lower tracking error portfolio encompasses a much higher certainty of controlled positive return. The illustration **is not related to any Goldman Sachs Asset Management product or strategy**. There is no guarantee that objectives will be met. Diversification does not protect an investor from market risk and does not ensure a profit

5. How does the risk-adjusted profile of Alpha Enhanced solutions compare with that of higher-risk strategies?

Alpha Enhanced strategies' potential for greater alpha stability is paired with alpha efficiency. As deviation from the benchmark increases, so does the potential for excess returns. This does not happen in a linear fashion, however. As tracking error increases, we see a decreasing marginal return to alpha. In other words, the potential for risk-adjusted outperformance tends to be highest at lower levels of tracking error. This allows enhanced strategies with limited tracking error to potentially generate more consistent alpha with a higher risk-adjusted return profile.

Efficient Frontier of Expected Tracking Error and Expected Alpha, Impact on Information Ratio



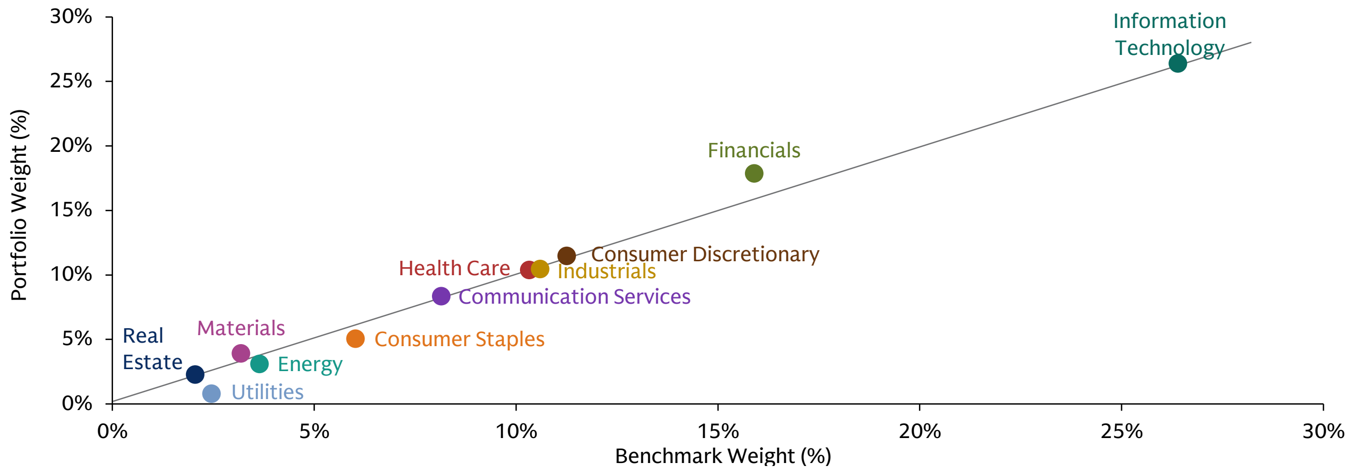
Source: Goldman Sachs Asset Management. For illustrative purposes only. The illustration shows the relationship between expected tracking error and expected alpha. What is generally observed is that as tracking error increases, we see a decreasing marginal return to alpha. Changing the structure of the index involves a lot of effort and thus "costs" more for every extra change necessary, such that operating at lower levels of risk entails lower marginal costs. Therefore, at lower tracking error levels, the information ratio tends to find its maximum. Put differently, the risk adjusted outperformance tends to be highest at lower tracking error levels.

6. These strategies seek to provide market beta, keeping tracking error within pre-set limits. How does this work?

To keep tracking error within pre-set limits, Alpha Enhanced strategies tend to hold a larger number of names than strategies with higher tracking error and to track their benchmarks more closely. They also make smaller active bets across a larger number of names, which better diversifies the sources of risk because these bets are distributed along the entire benchmark. This distribution of active weights contributes to robust risk management by allowing for more effective monitoring of each bet's impact on portfolio characteristics including risk-return profile, style and diversification. It also facilitates the dynamism required to adapt these characteristics to avoid unintended risk exposures.

As a result, we believe an Alpha Enhanced approach can result in less significant deviations from the composition of the benchmark, which allows it to continue providing beta. The dynamic nature of this approach allows for firmer control of unintended biases than might be available in a non-systematic framework.

150bps Tracking Error Portfolio Versus Benchmark Weight by Sector



Source: Goldman Sachs Asset Management. As of October 2025. For illustrative purposes only. There is no guarantee that objectives will be met. The portfolio risk management process includes an effort to monitor and manage risk, but does not imply low risk. Diversification does not protect an investor from market risk and does not ensure a profit.

7. What other portfolio challenges can Alpha Enhanced solutions help to address?

Alpha Enhanced solutions could be particularly helpful in enhancing the resilience and transparency of passive equity portfolios that incorporate specific financial or non-financial criteria, such as sustainability. The introduction of sustainability parameters is an active decision that can lead to risks which need to be thoughtfully managed. For example, the integration of exclusions in an off-the-shelf sustainable index or a bespoke sustainable overlay on a conventional index leads to divergence from the underlying market portfolio. This can result in unintended style and sector tilts that have implications for portfolio transparency and performance, particularly if they are left unmanaged.

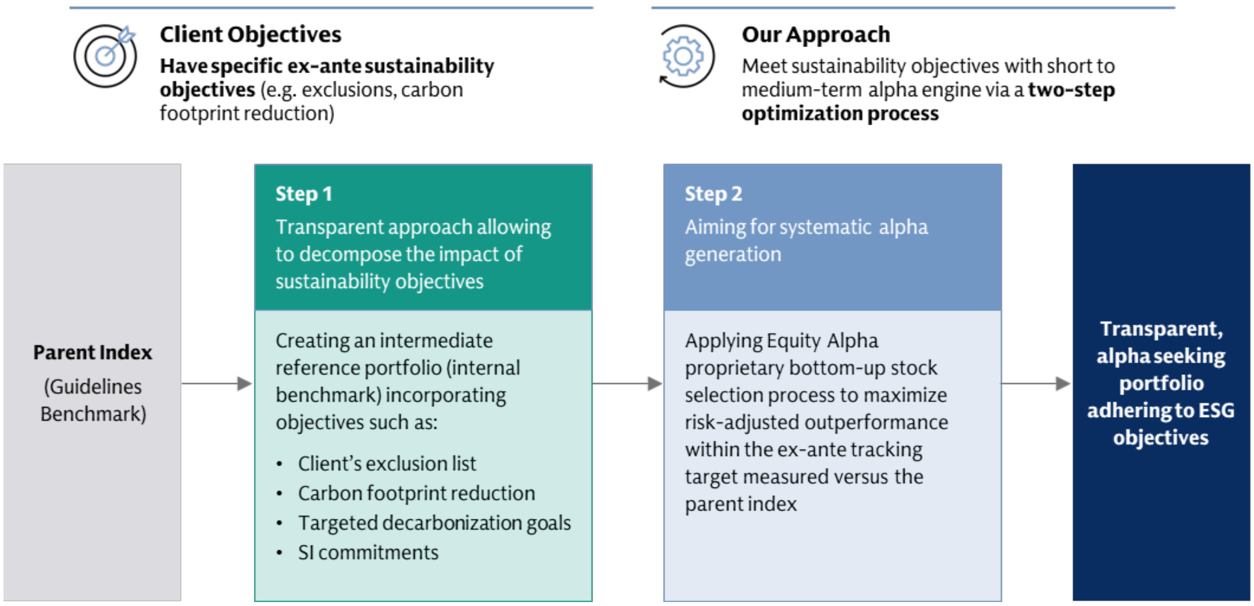
Another important consideration is the need to account for transparency and control risks. Most sustainable indices involve a combination of intricate and correlated sustainability parameters. The complexity of these parameters and their interactions may obscure the impact they have on the risk and return profile of investment strategies designed to track these indices. We believe Alpha Enhanced solutions provide a balanced approach to managing these sustainability-induced active risks.

8. How can Alpha Enhanced solutions help implement sustainability objectives more efficiently?

In analyzing performance, it can be challenging to separate the impacts from sustainability criteria and alpha views because the two components are intertwined. For this reason, we think a quantitative approach capable of sequencing the implementation of sustainability criteria and the alpha-engine overlay is needed. The first step is to minimize the tracking error introduced by sustainability criteria, dampening the impact of the resultant tilts and biases. The next step is to enhance the resultant risk-adjusted portfolio performance by incorporating a systematic alpha engine designed to operate within the tracking-error budget determined by the client.

This sequenced two-step approach balances the two sources of active risk – the implementation of sustainability criteria and the addition of the alpha engine – in a way that can produce a more resilient sustainable equity solution, in our view. Integrating an alpha engine is intended to efficiently address performance risk, helping smooth out the performance impacts of sustainability criteria. Since passive sustainability approaches tend to be reliant on the idiosyncratic performance patterns resulting from sustainability parameters, a moderate alpha component can allow investors to incorporate more systematic sources of excess return, potentially balancing out the portfolio's overall return profile.

Transparent two-step optimization approach to separate active performance impact originating from long-term sustainability objectives and bottom up stock selection.



Source: Goldman Sachs Asset Management. As of November 6, 2025. For illustrative purposes only. There is no guarantee that objectives will be met.

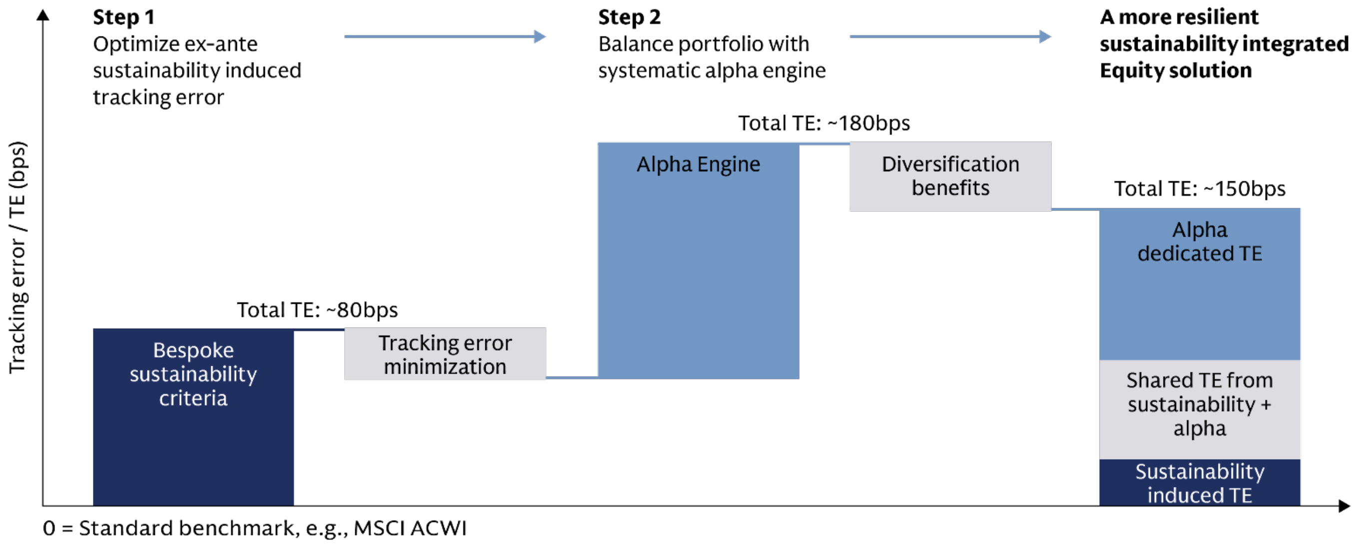
9. Does this two-step approach have other potential portfolio benefits?

By incorporating alpha views uncorrelated with sustainability criteria, we believe this approach helps improve tracking-error efficiency, performance resilience and transparency. The two-step approach yields potential diversification benefits in the use of risk budgets, because some of the sustainability-related risk can be used for alpha generation. As a result, the total tracking error of the two-step process is lower than the tracking error each step would incur independently – a more efficient use of tracking error that can improve the risk-adjusted return profile of the portfolio.

This approach could also contribute to cost efficiency by optimizing the active risk allocation and offering the potential for moderate excess returns that are not offered in typical passive index replication approaches.

Importantly, the fact that each step is done separately allows for a clear distinction between excess returns and tracking error originating from systematic bottom-up stock selection versus the bespoke sustainability criteria. We view this transparency as a potentially powerful tool for investors to have more decision-useful data about how their sustainability objectives influence their portfolio's risks and returns, which could in turn help investors better assess how they will evolve their sustainability parameters, keeping performance in mind.

The Two-Step Approach Aims to Improve the Use of Portfolio Tracking Error



Source: Goldman Sachs Asset Management. As of August 2025. For illustrative purposes only.

10. Is this a good time to consider adding an Alpha Enhanced strategy to a portfolio?

In an environment of moderating beta returns,[4] passive allocations are bound to constrain the return profile of investor portfolios – even below benchmarks after fees – while leaving limited room to manage growing risks from heightened market uncertainties and index concentration.[5] Meanwhile, traditional active strategies could introduce performance uncertainty and may be less compatible with cost sensitivity. Alpha Enhanced solutions may help navigate these challenges, offsetting lower beta returns through alpha enhancement with controlled excess return potential. These solutions also introduce comprehensive risk-management practices and leverage a more dynamic and forward-looking perspective of stocks suitable for uncertain market conditions, while maintaining broad market exposure and performance predictability in a cost-efficient manner. For all these reasons, we think adding a little active to core equity allocations in an Alpha Enhanced solution could provide investors with additional tools and flexibility to navigate uncertain markets.

11. How can Goldman Sachs Asset Management help with Alpha Enhanced investing?

Our Alpha Enhanced solutions are designed and managed by our Quantitative Investment Strategies (QIS) team, which delivers data-driven investment solutions across equities and alternative strategies. With more than 35 years of experience in systematic, data-driven investing, access to 100-plus high-quality datasets, and 10+ years leveraging artificial intelligence (AI), the QIS team can offer portfolios across a variety of risk and return profiles, from core and extension strategies to Alpha Enhanced lower-tracking-error solutions. The team is backed by the infrastructure and resources of the Goldman Sachs platform, benefiting from the firm's investment of billions of dollars yearly in technology, including data and engineering talent. We can incorporate customizations like targeted regional exposures, ESG criteria, and other non-financial objectives to meet clients' unique needs.

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[4] Goldman Sachs Global Investment Research. As of October 18, 2024.

[5] See for example: "Why Your S&P 500 Index Fund Might Be More Risky Than the Internet Bubble," Morningstar. As of October 11, 2025.

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