Insights
Active Quantitative Equity (AQE)

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Net Zero and the Enhanced Approach to EM Equities

The Effect of Adding a Climate Objective on Risk and Return

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- We sought to determine whether investors can address their Net Zero objectives without sacrificing the risk and return characteristics of an Enhanced, or low-risk active, approach in emerging markets equities.
- By utilising the natural active risk within the Enhanced framework, we were able to integrate climate objectives with only a marginal change in the overall tracking error relative to the benchmark.

As investors look to build climate-aware portfolios and consider how best to meet Net Zero[1] objectives, we in State Street Global Advisors' Active Quantitative Equity (AQE) team believe it is important that investors pay particular attention to their emerging markets equity allocation. The makeup of emerging markets equities brings key challenges and opportunities when considering a Net Zero, or climate-aware, approach.

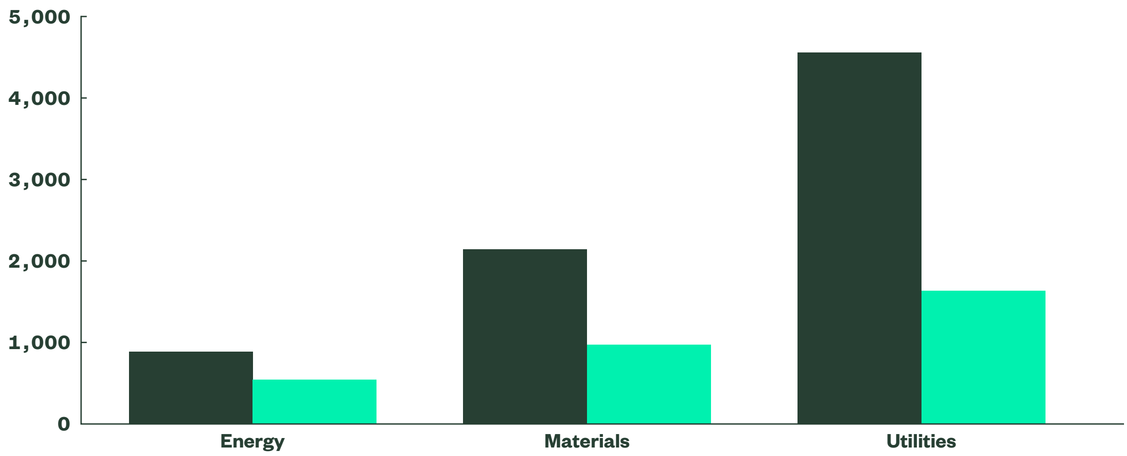
The first consideration is the market construct of emerging versus developed countries. Carbon dioxide emissions are typically concentrated in three of the 10 sectors under the GICS classification system: Energy, Materials, and Utilities.

These three sectors currently make up 15% of the market cap of emerging markets (EM), and make up only 11% of the market cap of developed markets (DM).[2] Though this difference may not seem extreme, because 81% of EM emissions come from these three sectors,[3] the higher weighting is meaningful.

Second, in addition to the higher weight in higher-emission sectors, the intensity of the emissions is much higher on a like-for-like basis in EM versus DM. If we aggregate the CO_2 emissions across stocks in AQE's investable universe of EM and DM stocks, we see a stark pattern. Despite being only 12% of the combined world's market cap, EM names produce 46% of the CO_2 emissions. Figure 1 shows the Carbon Intensity which is defined as total emissions[4] within each of the three key sectors scaled by total revenue[5] of that sector, which provides a standard measure of overall carbon footprint. The relative level of emissions is significantly greater in EM than DM.

Figure 1
Carbon Footprint in Energy, Materials and Utilities
Tonnes of CO_2 Emission per USD Million of Revenue

Emerging Markets
Developed Markets



Source: TruCost, State Street Global Advisors, as at 30 June 2021.

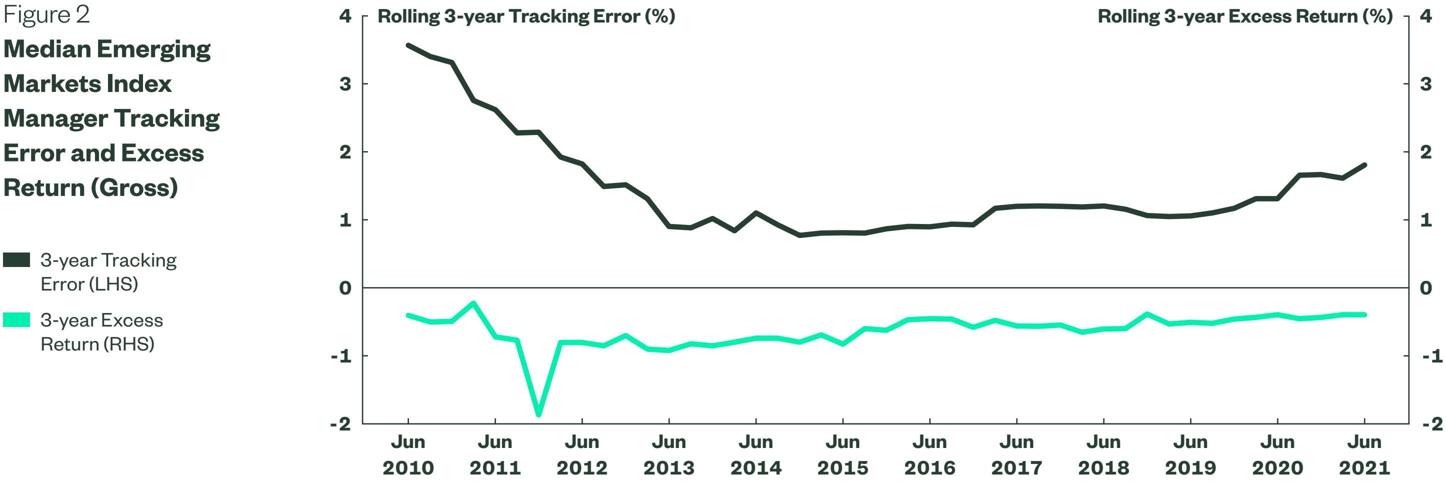
These structural elements are unsurprising, as emerging markets are often associated with rapid growth in industrialisation, fixed assets, and infrastructure, resulting in significant energy and power needs. Often these needs are met by older power plants, older technologies, and less clean energy generating capacity than that used in developed markets, resulting in proportionally greater carbon footprints. This also means that the emerging market segment should not be overlooked, and that adding a sustainable climate approach to an EM allocation can be disproportionately effective as investors transition to a lower-carbon portfolio or move along the path to Net Zero.

EM Enhanced Strategies

Investors historically have faced two options when looking to invest in emerging market equities. The first was to take a highly active approach, often involving significant active risk, or tracking error, relative to the benchmark. Whilst this may result in outperformance for these funds over discrete time periods, at times investors have been disappointed with the outcomes and the higher fees associated with these strategies.

For investors' unwilling to take on the risk that accompanies active strategies, or for those looking to reduce their overall fee budgets, a second common approach is indexing. Whilst skilled index managers can typically achieve low tracking error against their benchmarks in developed markets, in emerging markets outcomes have been more varied. In EM there can be market access difficulties, higher trading costs, illiquidity, and higher levels of turnover in index reconstitution, which hinder close tracking. On average, the median EM index managers generate a tracking error of 1–2% relative to their benchmark over time.[6] In this instance the tracking error generated is not by design, and therefore does not lead to better performance to compensate for the risk. Figure 2 shows that in recent years the median EM index manager has underperformed by -0.5% to -1.0% over rolling 3-year periods.

Figure 2
Median Emerging Markets Index Manager Tracking Error and Excess Return (Gross)



Note: Median of index strategies benchmarked to the MSCI Emerging Markets Index was used; oldest share class was used to perform the calculations; a group of 57 funds was used from Morningstar Direct to calculate the median 3-year return and rolling tracking error; rolling methodology rolls over every three months; past performance is not a reliable indicator of future performance.
Source: Morningstar, eVestment, State Street Global Advisors, as at 30 June 2021.

In between the extremes of active and index are "Enhanced" strategies. These seek to outperform their cap-weighted benchmarks but take relatively low active risk — typically around 1% per annum — which is much lower than a typical active manager and similar to that of the median index manager.[7] The tracking error these strategies deliver, however, is purposeful in that it is designed to offer the opportunity to *outperform* the index. Enhanced managers use active positions in stocks, sectors, and countries to "tilt" a portfolio to maximise alpha exposure whilst expending the active risk budget in an informed way.

Enhanced strategies therefore sit in a sweet spot: generally low tracking error; the opportunity for positive excess returns; and low cost compared to active managers. The approach offers active market participation in an information ratio- and fee-efficient manner and has garnered significant interest for EM equity investors looking to get more from their core allocation.

Sustainable Climate EM Enhanced

Next, we investigate the impact of adding a climate objective to an EM Enhanced portfolio on the risk and return profiles associated with the strategy. Our a priori expectation is that we can use the natural tracking error of an Enhanced fund, and broad diversification of its holdings, to accommodate this additional objective without significantly increasing risk or decreasing the returns opportunity.

We modelled our base case for the experiment on the AQE team's Emerging Markets Enhanced strategy,[8] which was designed to outperform its benchmark by 0.75% to 1.00% per annum, with risk up to 1.75%.[9] Our base case EM Enhanced portfolio was constructed using an optimised approach, balancing return expectations with risk forecasts and transaction costs measures.

For our hypothetical Sustainable Climate EM Enhanced strategy, we built sustainable climate metrics and objectives into the optimisation process (Figure 3), whilst still seeking to maximise returns, subject to risk and transaction costs.

Figure 3
Example Climate Metrics and Objectives

Climate Metric	Objective vs. Benchmark
Carbon Emissions	Reduction of carbon intensity by 50%[10]
Fossil Fuels	Reduction of reserves by 50%[11]
Brown Revenues	Reduction by 50%[12]
Green Revenues	Increase by 100%[13]

Note: Past performance is not a reliable indicator of future performance; for illustrative purposes only.
Source: State Street Global Advisors, as at 30 June 2021.

Our research goal was to determine whether the unique risk and return advantages of enhanced management could be maintained when climate objectives were integrated within our existing framework — to create an information ratio- and carbon-efficient approach. By utilising the natural active risk within the enhanced framework, we were able to integrate the climate objectives with only a marginal change in the overall tracking error relative to the benchmark (Figure 4). Importantly, we were able to achieve all these objectives without taking significantly larger country or sector positions relative to the benchmark than we take in the base strategy.

Figure 4
Backtested Performance Summary

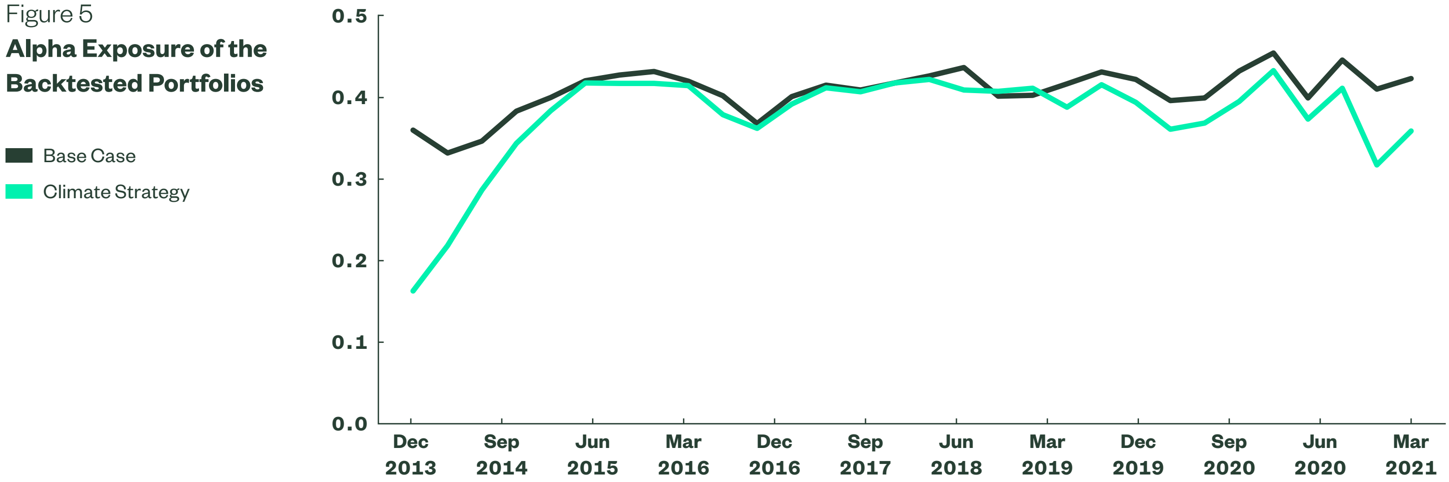
	Base Case	Climate Strategy
Annual Return, Net of Transaction Costs (%)	8.83	9.06
Annual Volatility (%)	18.17	18.21
Active Return (%)	1.27	1.49
Active Risk (%)	1.21	1.17
Information Ratio	1.04	1.27
Alpha Exposure	0.41	0.38
Average Country Misweight (%)	0.11	0.12
Average Sector Active Weight (%)	0.15	0.16
Turnover (% p.a.)	40.00	41.00
Number of Stocks (average)	660.00	601.00

Note: **The data displayed for the Emerging Markets Enhanced Base Case and Climate strategies are hypothetical examples of backtested performance for illustrative purposes only and is not indicative of the past or future performance of any State Street Global Advisors product.** The backtested performance does not represent the results of actual trading but is achieved by means of the retroactive application of a model designed with the benefit of hindsight. Actual performance results could differ substantially, and there is the potential for loss as well as profit. The backtested performance may not take into account material economic and market factors that would impact the adviser's actual decision-making. The performance reflects management fees, transaction costs, and other fees and expenses a client would have to pay, which reduce returns. Please refer to the Methodology Appendix for a description of the methodology used as well as an important discussion of the inherent limitations of backtested results.
Source: State Street Global Advisors, as at 30 June 2021.

The annual return achieved in these historical hypothetical results has no doubt been boosted by the poor performance of the energy sector over this period. However, the Alpha Exposure — which is a measure of our *expected excess return* — is only marginally diminished by the inclusion of the climate objectives over most periods as compared to the standard Emerging Markets Enhanced strategy (Figure 5).

Figure 5

Alpha Exposure of the Backtested Portfolios

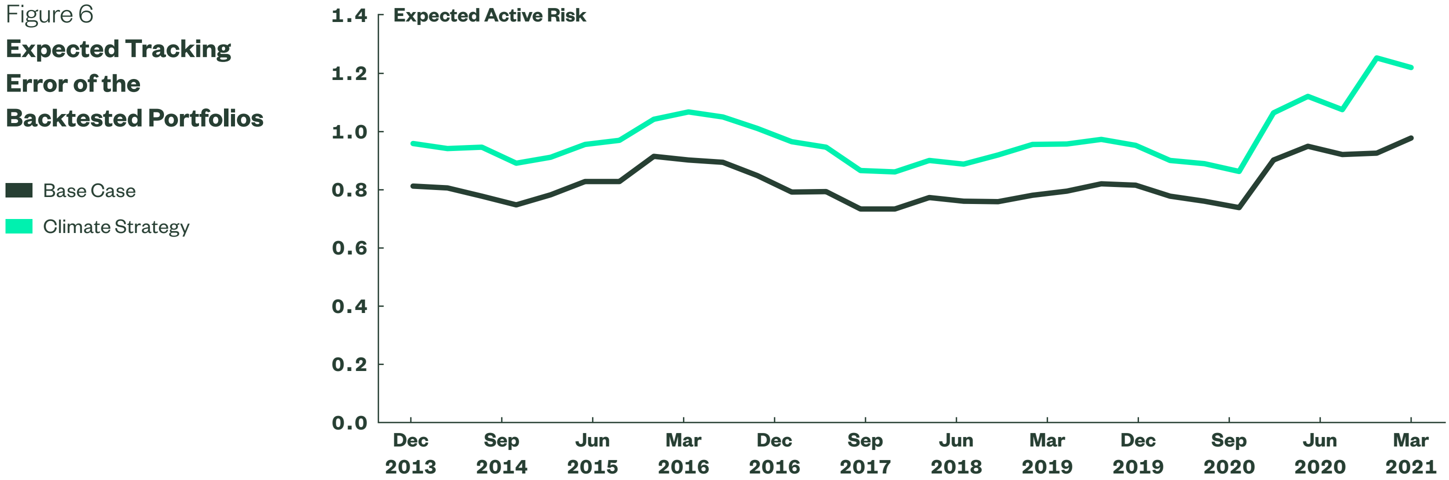


Note: **The data displayed for the Emerging Markets Enhanced Base Case and Climate strategies is a hypothetical example of Backtested Performance for illustrative purposes only and is not indicative of the past or future performance of any State Street Global Advisors product.** Backtested Performance does not represent the results of actual trading but is achieved by means of the retroactive application of a model designed with the benefit of hindsight. Actual performance results could differ substantially, and there is the potential for loss as well as profit. The Back-Tested Performance may not take into account material economic and market factors that would impact the adviser's actual decision-making. The performance reflects management fees, transaction costs, and other fees and expenses a client would have to pay, which reduce returns. Please reference Back-tested Methodology Disclosure in the Appendix for a description of the model methodology as well as an important discussion of the inherent limitations of back-tested results.
Source: State Street Global Advisors, as at 30 June 2021.

Whilst the realised active risk of the two approaches is very close, the cost of the climate constraints comes in terms of ex-ante, or expected, risk (Figure 6). The average increase in ex-ante active risk, however, was only 15 basis points. The hypothetical Sustainable Climate EM Enhanced strategy therefore is generally consistent with the risk and return characteristics of an EM Enhanced strategy.

Figure 6

Expected Tracking Error of the Backtested Portfolios



Note: **The data displayed for the Emerging Markets Enhanced Base Case and Climate strategies is a hypothetical example of backtested Performance for illustrative purposes only and is not indicative of the past or future performance of any State Street Global Advisors product.** Backtested results are not indicative of the past or future of any State Street Global Advisors product. The portion of results through 06/30/2021 represents a backtest of the AQE G5 alpha model, which means that those results were achieved by means of the retroactive application of the model which was developed with the benefit of hindsight. All data shown above does not represent the results of actual trading, and in fact, actual results could differ substantially, and there is the potential for loss as well as profit. Please reference the Backtested Methodology Disclosure for a description of the methodology used as well as an important discussion of the inherent limitations of backtested results. Past performance is not a reliable indicator of future performance; exposures are as of the date indicated, are subject to change, and should not be relied upon as current thereafter.
Source: State Street Global Advisors, Axioma, as at 30 June 2021.

Closing Thoughts

As evident in our hypothetical examples, a Sustainable Climate EM Enhanced equity strategy can incorporate climate objectives, along with the risk and return objectives of a standard strategy whilst generally preserving the information ratio and fee efficiency characteristics of an enhanced approach. It may also be possible to apply AQE's flexible, modular approach to portfolios in developed markets as well as other geographies and regions and incorporate different climate metric targets.

There are tangible steps that investors can take today to reduce the climate impact of their investments. AQE's approach to meeting the climate objective will evolve over time, as science, data, and green technology develop. We also anticipate the relative importance of climate-relevant components, and the degree to which they are integrated into a portfolio, will change over time as investors seek to strike an investment balance between short-term risks and long-term opportunities.

Methodology Appendix

The backtested performance shown was created by the State Street Global Advisors Active Quantitative Equity Team.

The historical backtest was performed using data as available at the historical point in time to eliminate any survivorship bias.

The hypothetical Emerging Markets Enhanced Sustainable Climate Strategy backtest period covers from 31 December 2013 to 30 June 2021.

The back-tested performance results shown herein do not represent the results of actual trading using client assets but were achieved by means of the retroactive application of the Enhanced Equity model against actual historical data. This process was designed with the benefit of hindsight, and thus, the performance results noted above should not be considered indicative of the skill of the advisor or its investment professionals. The backtested performance was compiled after the end of the period depicted and does not represent the actual investment decisions of the advisor. These results do not reflect the effect of material economic and market factors on decision making. In addition, back-tested performance results do not involve financial risk, and no hypothetical trading record can completely account for the impact of financial risks associated with actual investing. All back-tested performance is net of transaction costs calculated using hypothetical transaction cost model. It is assumed there are no external cash flows and the maximum cash holding is set to 2% of AUM. All dividends are reinvested.

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The Gross back-tested performance data is reported on a gross of management and administrative costs, but net of transaction costs. The net backtested performance data is reported on net of management and administrative fees assumed to be 75 bp p.a. The performance includes the reinvestment of dividends and other corporate earnings and is calculated in USD.

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State Street Global Advisors does not yet manage actual assets in the hypothetical Emerging Markets Enhanced Sustainable Climate Strategy. A complete list of the firm's composites and their descriptions is available upon request.

Endnotes

1 Net Zero refers to a state in which the greenhouse gases going into the atmosphere are balanced by removal out of the atmosphere. It is international scientific consensus that, in order to prevent the worst climate damages, global net human-caused emissions of carbon dioxide (CO_2) need to fall by about 45 percent from 2010 levels by 2030, reaching net zero around 2050.

2 Source: State Street Global Advisors, MSCI, GICS, as at 30 June 2021.

3 Source: State Street Global Advisors, TruCost, as at 30 June 2021.

4 Measured as direct emissions and first-tier indirect emissions, in tonnes, as provided by TruCost.

5 In USD millions.

6 Source: Morningstar, eVestment, State Street Global Advisors, as at 30 June 2021.

7 Past performance is not a reliable indicator of future performance. Source: State Street Global Advisors, as at 31 July 2021.

8 The AQE team has been managing EM Enhanced funds for over a decade; the first fund was launched in 2007.

9 Past performance is not a reliable indicator of future performance. Source: State Street Global Advisors, as at 31 July 2021.

10 Measured as direct emissions and first-tier indirect CO_2 emissions in metric tons per million dollars of revenue, as provided by TruCost.

11 Measured as metric tons of CO_2 emissions if proven and probable fossil fuel reserves were burned, as provided by TruCost.

12 Measured as percentage of revenues derived from extraction or power generation from fossil fuels, as provided by TruCost,

13 Measured as percentage of revenues contributing to the transition to a green economy, as provided by FTSE Russell.

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- Build from breadth
- Invest as stewards
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* Pensions & Investments Research Center, as of December 31, 2020.
† This figure is presented as of June 30, 2021 and includes approximately $63.59 billion of assets with respect to SPDR products for which State Street Global Advisors Funds Distributors, LLC (SSGA FD) acts solely as the marketing agent. SSGA FD and State Street Global Advisors are affiliated.

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