ACADIAN

ESG: The Imperative of a Systematic Approach

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- We believe that ESG concepts have significant value for investing, and that ESG not only benefits from, but calls for, a sophisticated systematic approach.
- The central features of modern systematic investing—embrace of alternative data, advanced forecasting methods, and flexible portfolio construction—align naturally with the twin challenges of extracting alpha from ESG and reflecting asset owners' values in their portfolios.
- Alternative approaches to ESG, including mechanical rules-based and discretionary strategies, are susceptible to hidden costs associated with their imprecision, including forgone return and inadvertent risk.

ESG is one of the most important trends in contemporary investing. ESG issues affect investment risk and return, and asset owners are demanding ESG strategies in diverse market and portfolio contexts. Yet ESG is a challenge to engage with, owing to its sprawling scope, lack of consistent definitions, and subjective elements. Moreover, as the popularity of ESG has surged, superficial chatter around the topic has grown. The product landscape has also become cluttered, reflecting both new launches and the rebranding of existing offerings as ESG. As a result, asset owners face more difficulty than ever in identifying which ESG strategies can best achieve their combined financial and ESG-related objectives.

The systematic investment process offers a ready solution, however, and the purpose of this note is to demonstrate why. To begin, we show how that systematic investing's central features—its embrace of alternative data, advanced forecasting methods, and flexible portfolio construction—not only aid in but are crucial to extracting meaningful alpha from ESG concepts and aligning portfolios with asset owners' ESG-related values.

We then demonstrate the benefits of the systematic approach via a case-study involving one of today's most widely-embraced ESG contexts—implementation of a climate-aware strategy as a core portfolio allocation. Relative to conventional rules-based ESG approaches, we show that a systematic implementation is less vulnerable to inadvertent risk exposures, has more enduring alpha generation potential, and can achieve a broader range of ESG objectives.

Systematic Investing and ESG

ESG investing has two principal goals: 1) extraction of alpha from ESG concepts, and 2) alignment of investments with the asset owner's values and societal norms, often with the goal of promoting change. The systematic investment process is especially well suited to meeting these joint objectives. In fact, ESG can be seen as a natural extension of systematic investing.[1]

Figure 1: The Systematic Investment Process – Key Attributes for ESG

Source: Acadian.

[1] Acadian was the first quantitative investment manager to sign the UN PRI all the way back in 2009.

To see why, consider three core components of the systematic process (Figure 1):

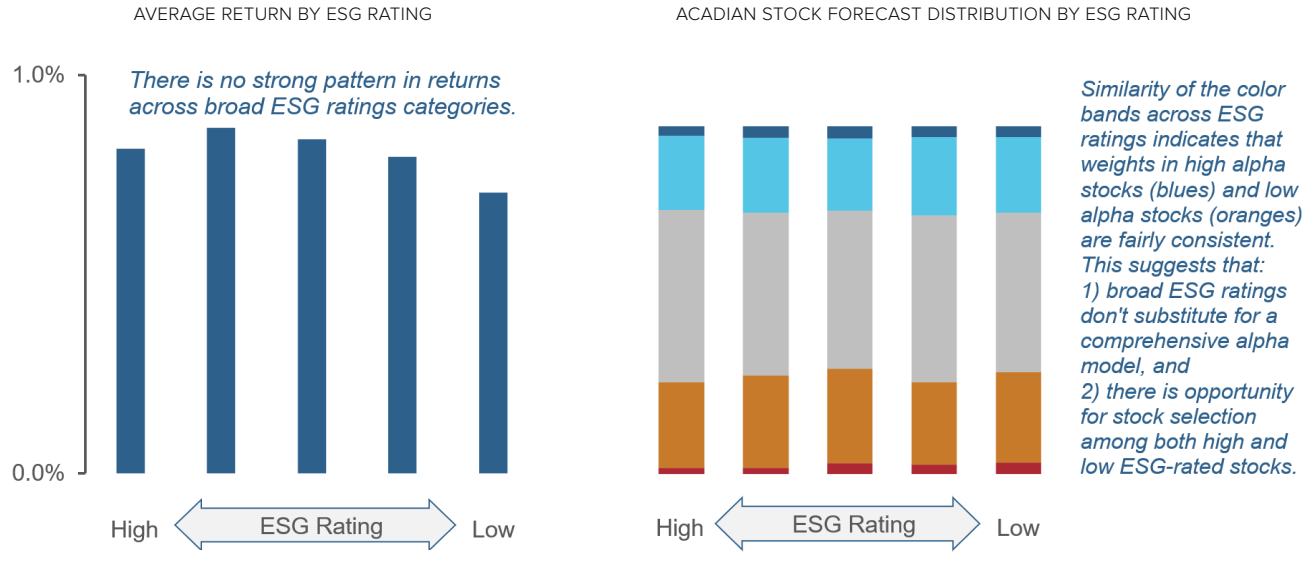
Data inputs: While early generations of quant models were fueled by fundamental, market pricing, and macroeconomic data, the focus of contemporary signal development has shifted towards the expansive and nebulous world of alternative data. In the investing context, alternative data refers to information that was originally intended for non-financial purposes. Among its salient characteristics, alt data may lack structure or governance by an authoritative body.[2] Alt data also is often difficult to readily map to tradable instruments.

These attributes of alt data also happen to characterize much ESG-related information. Representative examples include textual analysis of corporate disclosures to extract governance-related indicators or media reports about ESG-related incidents, scraping on-line information to assess the wellbeing of companies' employees, or estimating a company's carbon footprint from other characteristics. As a result, exploiting ESG-related information for investing purposes is naturally viewable as a subset of contemporary systematic investing's focus on alternative data.

Returns Forecasting: Extracting genuinely additive value from ESG-related information requires pushing the frontiers of forecasting in several respects. First, ESG-based signals should be precisely targeted. They should isolate specific information that the market is not already correctly pricing, perhaps because it is difficult to process or its relevance to fundamentals is misperceived. In contrast, broad "off-the-shelf" ESG ratings lack that precision, because they are designed to serve a variety of purposes and constituencies. As a result, we should not expect them to serve as effective standalone predictive signals, and, empirically, we do not see that they do. (Figure 2, left panel)

Second, ESG signal construction should incorporate contextual nuance. As examples, in detecting mis-valuations of companies' carbon assets we capture variation in political and regulatory environments that influences pricing; health and safety signals should be industry specific; corruption-related information has a different role in emerging versus developed markets; understanding how industrial incidents might influence regulation requires modeling the time horizon of the effect; analyzing forward-looking statements from company management as a governance measure requires an understanding of the context in which they are issued.

Figure 2: Broad ESG Ratings – Insufficient as a Standalone Source of Alpha



Sources: Acadian, MSCI. Charts created by partitioning stocks in MSCI World Index into five categories based on MSCI Final Industry Adjusted ESG Score. Right chart shows the distribution of Acadian's proprietary stock return forecasts within each group. Sample period 2010 – 2020. MSCI data copyright MSCI 2021. Unpublished. PROPRIETARY TO MSCI. For illustrative purposes only. Every investment program has the opportunity for losses as well as profits. Past results are not indicative of future results. The information provided is based on proprietary models. There can be no assurance that the forecasts will be achieved.

[2] Examples of unstructured data include free-form text and images as opposed to data tables and other well-organized and labeled forms of information.

Third, ESG signal development demands sophisticated and flexible predictive methods, including machine learning. Not only is much ESG-related alternative data processed using such techniques, but the underlying relationships between ESG characteristics and future returns are often complex, perhaps asymmetric or otherwise non-linear, and we may need to infer their nature from the data itself. As an illustrative example, consider using the size of a company's management team as a governance indicator. Larger teams may predict higher returns, as collective expertise and industry connections grow, but perhaps only up to a point. Beyond some threshold, factional behavior and other inefficiencies may outweigh benefits. Research that involves such complexities calls for advanced analytical approaches and a specialized, highly disciplined research environment.[3]

While targeted signals, precise construction, and flexible predictive modeling are crucial to extracting value from ESG information, those requirements are hardly unique to the ESG context. They have become the hallmarks of modern signal development, more broadly.

Portfolio construction: ESG aligns naturally with systematic portfolio construction in three respects. First, optimization-based portfolio construction provides a disciplined and precise mechanism to govern tradeoffs involved in implementing ESG considerations beyond those reflected in stock return forecasts. For example, it allows for selective divestment aimed at minimizing the impact on myriad financial risk exposures. Second, systematic portfolio construction machinery adapts to ESG's added complexity. In general, while ESG changes the specific optimization that must be carried out, the underlying portfolio construction machinery does not change. For example, it is straightforward to add constraints on exposures to climate-related risks or to ensure an active allocation to climate-friendly companies. Finally, systematic portfolio construction is highly customizable, which is an especially important trait in aligning portfolios with investor-specific values.

The alternatives to a systematic approach to ESG fall into two categories. One class consists of simple, rules-based strategies that several years ago would have been labeled smart beta but, as that term has fallen out of favor, are now likely to be mislabeled as "passive."[4] Such strategies tend to rely on modest exclusions and, as a result, are often relatively low active risk. The other class of alternatives consists of discretionary investing approaches, including concentrated "impact" strategies.

Alternatives from both classes tend to forgo advantages of a rich systematic process. Omission of a comprehensive and sophisticated stock forecasting model that includes both ESG and non-ESG signals risks losing out on alpha generation opportunities. Figure 2 (right panel) highlights that broad ESG ratings do not substitute for a comprehensive alpha model, and that there is ample opportunity for stock selection among stocks with both high and low ESG ratings.

Moreover, reductive portfolio construction leaves both rules-based and discretionary strategies vulnerable to inadvertent risks. While that problem is not unique to ESG, ESG may exacerbate it. For example, ESG ratings tend to be associated with known economic risk factors, most intuitively, industry risk, but also country exposures and market capitalization. (See Figure 3, for example.) ESG ratings coverage also tends to vary across market segments. It is particularly limited in emerging markets, for example, reducing portfolio formation flexibility there.

Figure 3: A Size Bias in Prominent ESG Ratings

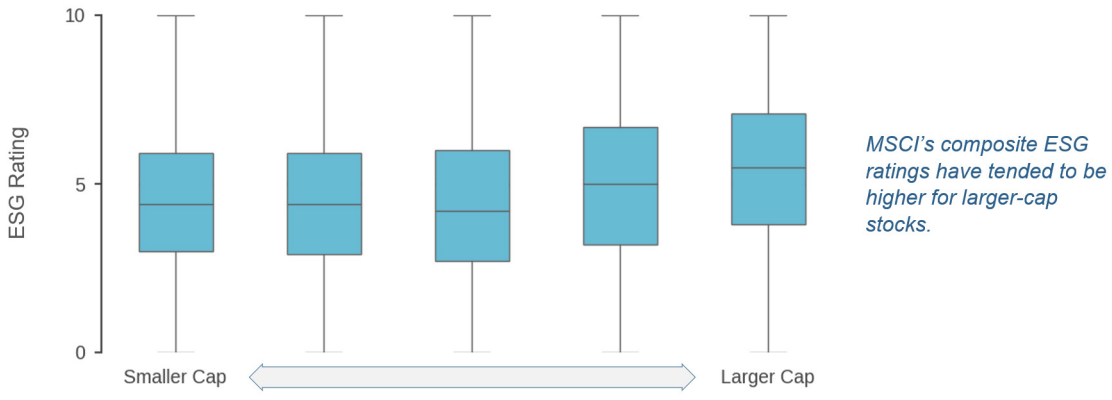


Chart shows the distribution of MSCI's Final Industry Adjusted Scores by market capitalization quintile as of December 2019 for stocks in ACWI countries. Sources: Acadian, MSCI. Copyright MSCI 2021. Unpublished. PROPRIETARY TO MSCI. For illustrative purposes only.

[3] For further detail and our views on research best practices, see *Machine Learning in Quant Investing: Revolution or Evolution?*, Acadian, April 2019.

[4] For prior work on the characteristics and risks of smart beta approaches, see *Smart Beta: Constrained Quantitative Active Management*, Acadian, January 2015 and *Factor Investing: Is Keeping It Simple Shortsighted?*, Acadian, February 2018.

Case Study: A Climate-Aware Portfolio

To demonstrate the benefits of a systematic approach to ESG, we consider one of today's most prevalent ESG focuses, replacing core equity holdings with a climate-aware strategy. Specifically, we define a primary ESG objective in terms of a 50% benchmark-relative reduction in portfolio carbon intensity.[5] We set the analysis in a developed market context, with MSCI World as the benchmark.

The conventional method of implementing this climate objective would be to divest companies based on their involvement in fossil fuel-related industries. To instantiate such a rules-based approach, we exclude companies whose revenue exceeds specific thresholds with respect to thermal coal extraction, oil and gas-related activities, and fossil fuel-based energy generation. (Figure 4)

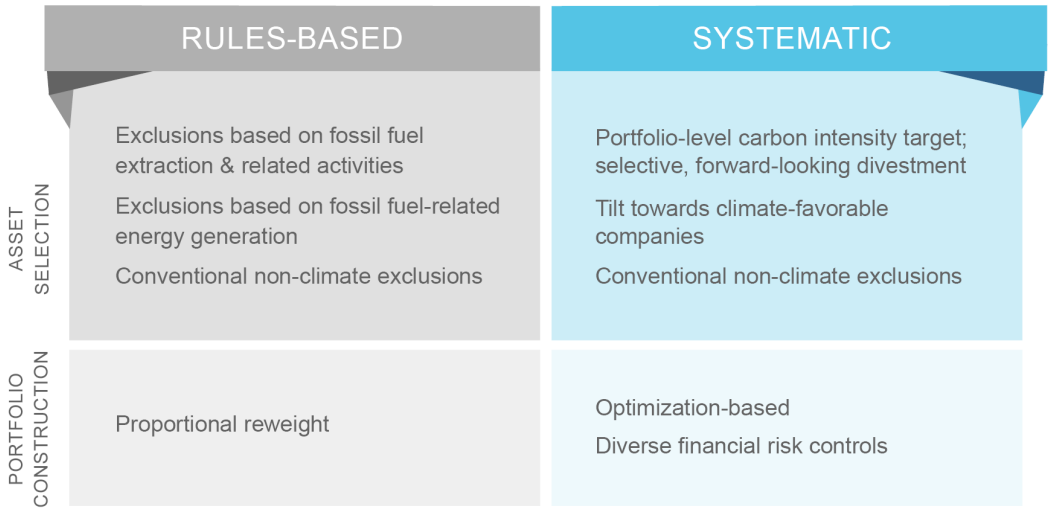
The implementation is crude, but the simplicity explains its popularity. Data to identify exclusions based on these criteria is readily available. Moreover, because the carbon footprints of many benchmarks are concentrated in a reasonably small number of companies, a manageable number of exclusions often achieves substantial decarbonization, even if the firms' aggregate weight in the index is material.

Two additional elements complete the rules-based specification. First, we apply popular non-carbon related ESG restrictions, specifically, the exclusion of companies that manufacture controversial weapons, are involved in tobacco production, or are deemed to violate the UN Global Compact.[6] Second, we form the portfolio simply by proportionally reallocating the weight of the excluded stocks across the remaining cap-weighted benchmark holdings.

Informed by these shortcomings, we specify a more refined, but comparably active, systematic strategy. Asset selection is nuanced in several respects: 1) Instead of carbon-based exclusions, the strategy targets portfolio-level carbon intensity, which is a more precise and direct expression of the primary objective and one that allows for more selective divestment in meeting it. 2) The selective divestment approach applies forward-looking criteria to identify companies that are less able or willing to decarbonize, reflecting the existence of emission reduction targets and policies, management incentives to meet climate objectives, and evidence of action. 3) The strategy incorporates a secondary ESG objective, actively tilting towards companies that are assisting decarbonization by providing climate solutions, including renewable energy, clean or energy efficient technologies and products, and green-certified property. 4) The strategy incorporates our comprehensive, proprietary alpha model, including several fully integrated ESG-related signals.

Portfolio construction is also refined. It is optimization-based, allowing for deliberate and precise trade-offs between carbon-related characteristics and other portfolio attributes, including expected return. It also incorporates controls on diverse aspects of financial risk.

Figure 4: A Climate-Aware Strategy — Contrasting Approaches



Rules-based excludes companies with revenue exceeding 10% from thermal coal power generation, 30% other fossil fuel-related power generation, 1% thermal coal extraction, or 10% oil and gas activities and companies on CarbonUnderground200 list. Please contact us for further information about the systematic specification. Source: Acadian.

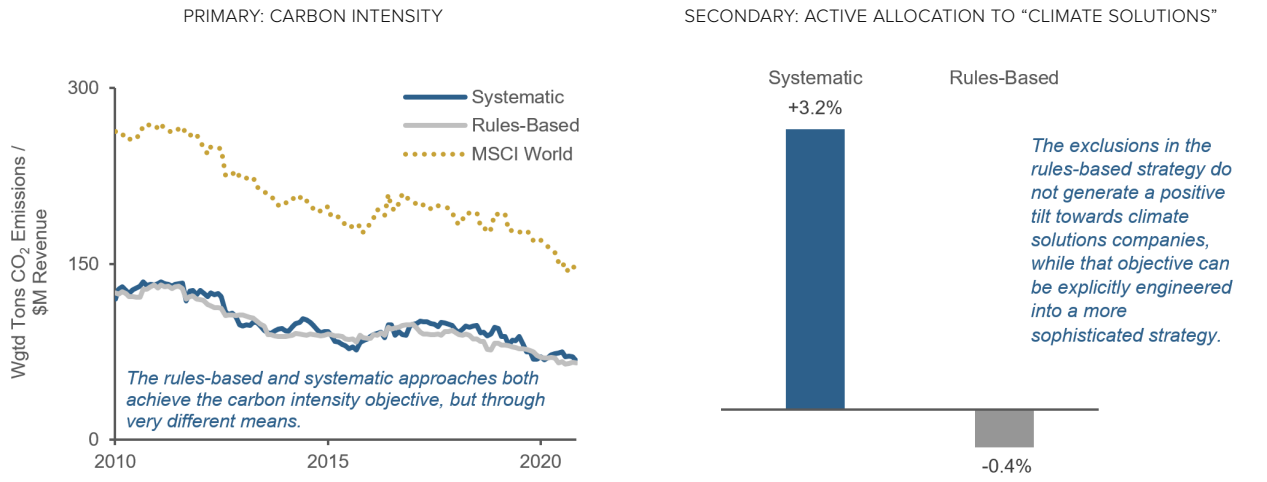
[5] Carbon intensity is defined as scope 1 + 2 C02 emissions divided by revenue.

[6] The tobacco production exclusion is based on a 10% revenue threshold. Controversial weapons include landmines, biochemical, and nuclear weapons.

Figures 5 and 6 compare high-level results across the two hypothetical strategies. With respect to the primary ESG objective, the left panel of Figure 5 shows that the two approaches deliver nearly identical reductions in carbon intensity. But the right panel shows that the systematic strategy also delivers on the additional design element of positive active exposure to companies that provide climate solutions, while the exclusions embedded in the rules-based approach provide no such benefit.

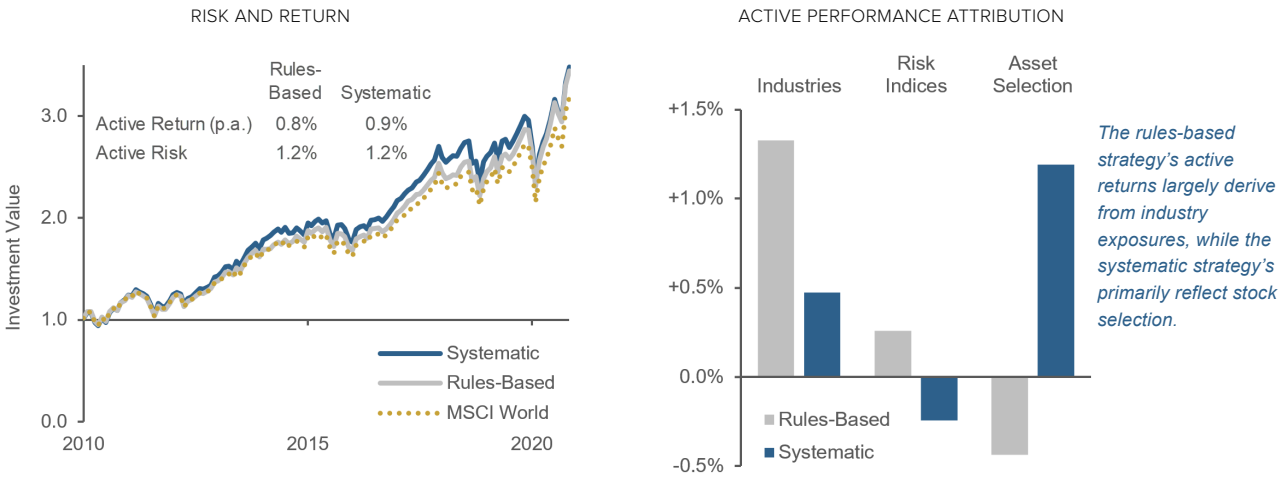
The left panel of Figure 6 shows that the two hypothetical strategies generate similar average financial performance over the analysis period, in terms of both active return and (by design) active risk. But closer examination reveals that the two strategies derive their performance from very different sources. The right panel of the figure shows that the rules-based strategy's active returns are almost entirely attributable to active industry exposure—a form of risk—while the systematic strategy's performance largely reflects stock selection.[7]

Figure 5: Hypothetical Performance Comparison — ESG Objectives



Active Allocation to "Climate Solutions" represents an average over the 2010-2020 analysis period. Analysis represents hypothetical portfolios based on an Acadian Global long only strategy from Jan 2010 to Dec 2020. Initial AUM of USD1bn. DM universe with $3bn market cap minimum. This is meant to be an educational illustrative example and is not intended to represent investment returns generated by an actual portfolio. The Systematic and Rules-Based hypothetical portfolios were created for educational illustrations and include unique sustainability criteria. The hypothetical results do not represent actual trading or an actual account and the Systematic approach assumes a fee of 0.3% p.a. and the Rules-Based approach assumes a fee of 0.15% p.a. Reference to the benchmark is for comparative purposes only. Hypothetical results are not indicative of actual future results. Every investment program has the opportunity for loss as well as profit. Index source: MSCI Copyright MSCI 2021. All Rights Reserved. Unpublished. PROPRIETARY TO MSCI.

Figure 6: Hypothetical Performance Comparison — Financial Objectives



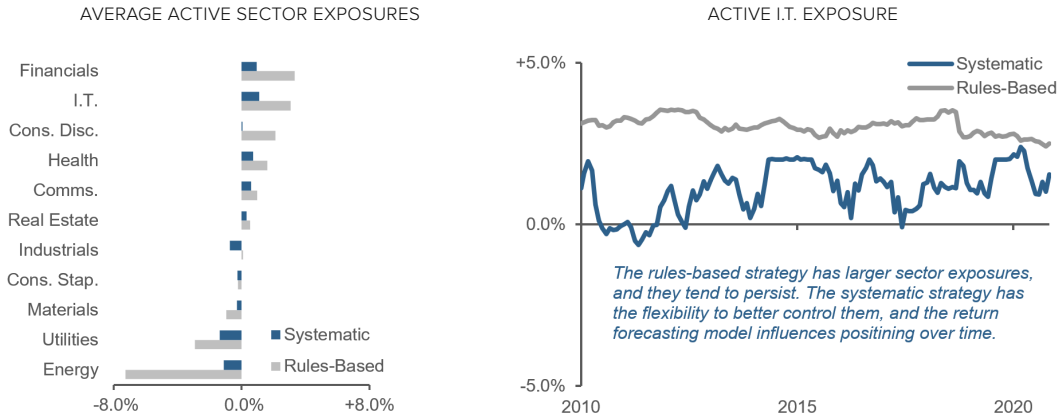
Active Performance Attribution represents annualized averages over the 2010-2020 analysis period. Analysis represents hypothetical portfolios based on an Acadian Global long only strategy from Jan 2010 to Dec 2020. Initial AUM of USD1bn. DM universe with $3bn market cap minimum. This is meant to be an educational illustrative example and is not intended to represent investment returns generated by an actual portfolio. The Systematic and Rules-Based hypothetical portfolios were created for educational illustrations and include unique sustainability criteria. The hypothetical results do not represent actual trading or an actual account and the Systematic approach assumes a fee of 0.3% p.a. and the Rules-Based approach assumes a fee of 0.15% p.a. Reference to the benchmark is for comparative purposes only. Hypothetical results are not indicative of actual future results. Every investment program has the opportunity for loss as well as profit. Index source: MSCI Copyright MSCI 2021. All Rights Reserved. Unpublished. PROPRIETARY TO MSCI.

[7] For simplicity, the attribution does not show small contributions attributable to currency and country exposures.

Figure 7 provides greater insight into the differences in industry risk. The left panel shows that the rules-based strategy's broad-brush approach to divestment leads to material underweights in energy and utilities, which, in turn, push the portfolio into material overweights in financial, technology, and consumer discretionary sectors. These overweights tend to be persistent, as demonstrated for the I.T. sector in the right panel. The systematic approach, in contrast, is able to achieve the carbon intensity reduction while generating much smaller average active sector exposures, the result of 1) industry and sector risk controls embedded in portfolio construction and 2) the flexibility to meet them provided by targeting carbon intensity at the portfolio-level. The systematic approach's active sector exposures are also (deliberately) more variable over time, reflective of the influence of the stock return forecasts.

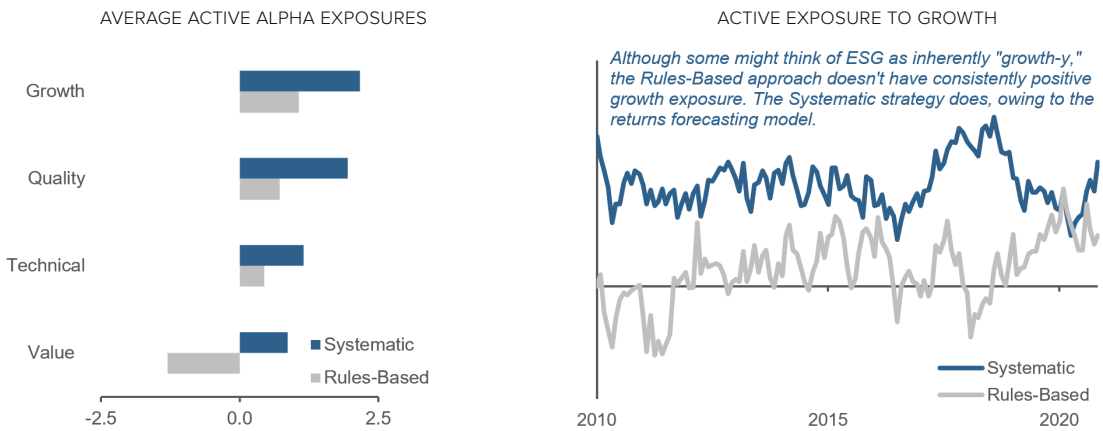
Figure 8 contrasts the two strategies with respect to stock selection. The left panel shows that the systematic strategy generates positive exposures to signal groups associated with growth, quality, technical, and value characteristics, reflective of the stock forecasting model. While the rules-based portfolio also exhibits positive average exposures to growth, quality, and technical signals during the sample period, they are incidental and relatively weak, and the strategy has been predisposed to hold expensive stocks (negative value exposure). Moreover, the right panel shows that even the growth exposure, which some investors might intuitively associate with lower-carbon investments, has been inconsistent over time.

Figure 7: Hypothetical Active Sector Exposures — Rules-based Versus Systematic



Average Active Sector Exposures represent averages over the 2010-2020 analysis period. Analysis represents hypothetical portfolios based on an Acadian Global long only strategy from Jan 2010 to Dec 2020. Initial AUM of USD1bn. DM universe with $3bn market cap minimum. This is meant to be an educational illustrative example and is not intended to represent investment returns generated by an actual portfolio. The Systematic and Rules-Based hypothetical portfolios were created for educational illustrations and include unique sustainability criteria. The hypothetical results do not represent actual trading or an actual account and the Systematic approach assumes a fee of 0.3% p.a. and the Rules-Based approach assumes a fee of 0.15% p.a. Reference to the benchmark is for comparative purposes only. Hypothetical results are not indicative of actual future results. Every investment program has the opportunity for loss as well as profit. Index source: MSCI Copyright MSCI 2021. All Rights Reserved. Unpublished. PROPRIETARY TO MSCI.

Figure 8: Hypothetical Active Alpha Exposures — Rules-based Versus Systematic



Hypothetical portfolios based on an Acadian Global long only strategy from Jan 2010 to Dec 2020. Initial AUM of USD1bn. DM universe with $3bn market cap minimum. This is meant to be an educational illustrative example and is not intended to represent investment returns generated by an actual portfolio. The Systematic and Rules-Based hypothetical portfolios were created for educational illustrations and include unique sustainability criteria. The hypothetical results do not represent actual trading or an actual account and the Systematic approach assumes a fee of 0.3% p.a. and the Rules-Based approach assumes a fee of 0.15% p.a. Reference to the benchmark is for comparative purposes only. Hypothetical results are not indicative of actual future results. Every investment program has the opportunity for loss as well as profit. Index source: MSCI Copyright MSCI 2021. All Rights Reserved. Unpublished. PROPRIETARY TO MSCI.

Although in recent years, the rules-based strategy's active industry positioning (e.g., short energy, long tech) has benefited its performance, we view that outcome as the fortuitous result of unintended economic risk exposures that do not provide a consistent return premium. In contrast, the systematic strategy has material exposures to the sources of alpha that it targets through the return forecasting model—which is backed with strong economic intuition and empirical evidence—and limited exposures to sources of economic risk that we see as unnecessary and potentially harmful. In other words, the systematic strategy's performance reflects intent, and we see it as more likely to endure.

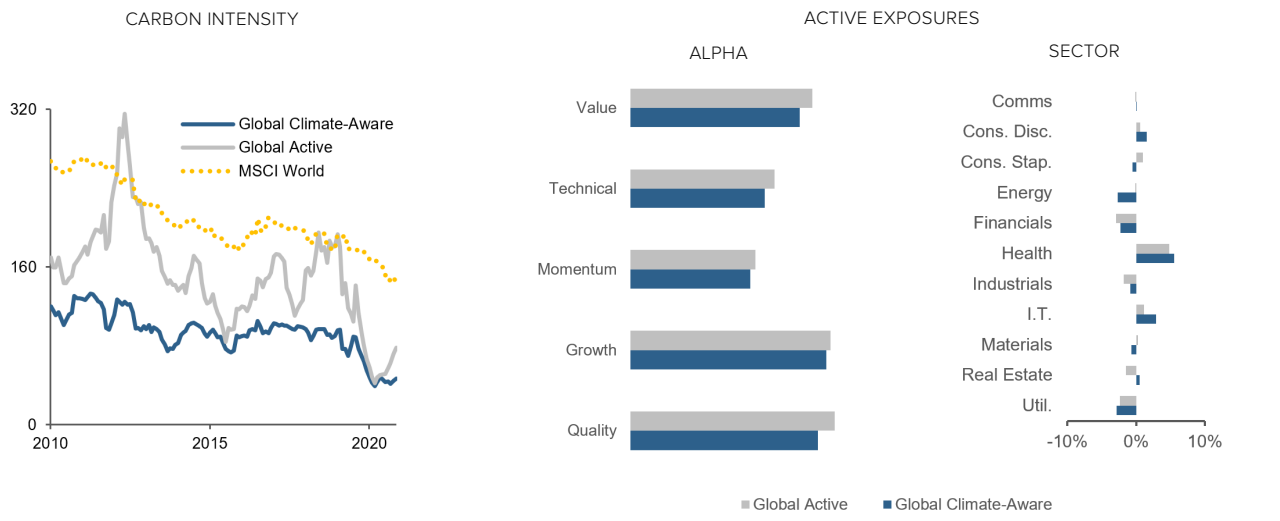
Integrating ESG Objectives into Active Systematic Strategies

The case study makes use of a conventional rules-based climate-aware implementation as the setting for a clear demonstration of the rationale for a richer systematic approach to ESG. For investors whose baseline would be a global *active* portfolio, however, that analysis may seem inapplicable, because the exclusions embedded in the rules-based strategy generate low active risk. But the advantages of the systematic approach also translate into more typical active investing contexts.

To demonstrate, we first establish a baseline hypothetical global active portfolio that incorporates our proprietary alpha model and risk controls, and that is calibrated to produce roughly 3% active risk. We then create a comparably active global climate-aware portfolio by layering in the primary and secondary carbon reduction objectives from the case study along with the other ESG criteria.

Figure 9 highlights key results. The left panel shows that the global climate-aware portfolio meets the 50% carbon intensity reduction target. The baseline global active portfolio also generates a material reduction, which reflects the presence of ESG signals that are integrated into the investment process. The explicit carbon intensity objective, however, provides for a larger and more consistent reduction. The right two panels highlight that meeting the carbon intensity goal comes at little cost in terms of exposures to signals in the forecasting model and active sector risk. This reinforces the benefits of flexible portfolio construction that were evident in the lower-active risk context of the original case study.

Figure 9: Integrating ESG Considerations into a Hypothetical Active Equity Strategy



Carbon Intensity is defined as weighted tons of CO_2 emissions (type 1 and 2) per million U.S. dollars of revenue. This is meant to be an educational illustrative example and is not intended to represent investment returns generated by an actual portfolio. It does not represent actual trading or an actual account but was achieved by means of using applying ESG considerations to stocks in the Acadian Global Stock Universe. Results do not reflect transaction costs, other implementation costs and do not reflect advisory fees or their potential impact. Hypothetical results are not indicative of actual future results. Every investment program has the opportunity for loss as well as profit. Index source: MSCI Copyright MSCI 2021. All Rights Reserved. Unpublished. PROPRIETARY TO MSCI.

Conclusion

We believe that ESG offers significant value for investing; given the breadth and intuitive relevance of ESG-related information, it would be surprising if it did not. Although capturing that value is not easy, systematic investing is naturally well suited to address the complexities involved—with respect to data, forecasting, and portfolio construction. Moreover, the systematic process's flexibility allows for precise and disciplined trade-offs between ESG and financial considerations as well as the customization of outcomes to investors' specific values. In essence, the systematic process has been evolved over many years so that it naturally reflects the qualities of a well-conceived approach to ESG investing.

But the benefits of a systematic approach to ESG extend further. Its need for comprehensive and high-quality ESG-related data to predict returns and manage risk also incentivizes an important form of active ownership, one aimed at promoting corporate transparency and disclosure with respect to ESG-related issues. Such activities have real relevance to societal stakeholders, not just to investors. Without meaningful data and metrics to assess ESG-related concerns and progress, we have little hope for improvement.

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