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Investment Management

Measuring the performance impact of ESG investing

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Abstract (NL)

De wereld van vermogensbeheer is in de afgelopen decennia onmiskenbaar veranderd door de opkomst van ESG (Environmental, Social en Governance) beleggen. ESG beleggen omarmt een meer holistische benadering waarbij naast financiële rendementen ook lange termijn duurzaamheid wordt meegenomen in het beleggingsproces. Traditionele attributie technieken zijn echter niet in staat de performance impact van enerzijds financiële en anderzijds niet-financiële (ESG) aspecten te onderscheiden. De vernieuwende attributie aanpak van Achmea Investment Management overkomt deze uitdaging met behulp van Shapley Values. Deze methode bevordert de transparantie door op nauwkeurige wijze de impact van verschillende beleggingskeuzes op performance te onderscheiden, hetgeen asset managers, institutionele beleggers, consultants en regelgevers ten goede komt. De inzichten over de impact van de strategie en ESG keuzes op portefeuille rendementen door de tijd heen kunnen aanleiding zijn voor discussies over het belegginsmandaat en kunnen mogelijk leiden tot wijzigingen in strategie of ESG beleid. Het Nobel prijs winnende werk van Lloyd Shapley onderschrijft deze aanpak en laat het belang zien van zijn werk op de ontwikkeling van performance attributie in vermogensbeheer.

Abstract (EN)

In recent decades, the investment management landscape has witnessed a profound transformation, with the rise of ESG (Environmental, Social, and Governance) investing, emphasizing a holistic approach beyond financial gains to assess long-term sustainability. Traditional performance attribution methods struggle to disentangle returns into financial and non-financial (ESG) components, a challenge addressed by Achmea Investment Management's innovative methodology rooted in Shapley Values. This methodology enhances transparency by accurately separating the impact of various portfolio choices on returns, benefiting asset managers, owners, consultants, and regulators. It also reveals how the investment strategy and ESG choices influence on portfolio returns evolves over time, sparking discussions on investment mandates and adjustments to strategy or ESG policy. Lloyd Shapley's Nobel Prize-winning work underpins this approach, highlighting the enduring relevance of his work in reshaping performance attribution in investment management.

Introduction

In recent years, investment management has undergone a significant transformation, with a growing recognition of the importance of considering non-financial factors. Environmental, social, and governance (ESG) investing has emerged as a key shift, emphasising a holistic approach that goes beyond financial returns to assess long-term sustainability.

ESG investing evaluates environmental, social, and governance criteria, aligning financial goals with broader societal and environmental objectives. These criteria cover areas such as climate change, labour standards, and business ethics.

Investors employ various approaches, including exclusion, engagement, and constructing portfolios based on non-financial factors. Initially, investors accepted minor deviations from benchmarks, believing they added societal value. However, as ESG investments grew, investors adopted stricter criteria, leading to greater influence of non-financial factors on returns.

This shift challenges traditional performance attribution methods that are unable to disentangle returns into financial and non-financial factors. It is calling for a methodology that accurately separates the effects from these two categories of factors on portfolio composition, in order to properly assess both the investment process of an (active) investment manager and the impact of the separate non-financial factors imposed on the portfolio.

As an example, consider a portfolio with a underweight to the energy sector, while energy is outperforming the broader benchmark. Traditional attribution methods are perfectly capable in measuring the impact of this underweight on return, providing answers to “what” happened. However, these methods lack the ability to provide a more thorough understanding of “why” this underweight existed in the first place. Is it due to the portfolio manager’s strategy, due to exclusions, ESG rating enhancement or carbon reduction?

Achmea Investment Management has developed a methodology that does exactly this. It provides increased transparency on the impact of the different portfolio choices that underpin the return of a portfolio compared to a benchmark, and is able to track this over time. This is useful information for asset managers, asset owners, investment consultants and supervisors.

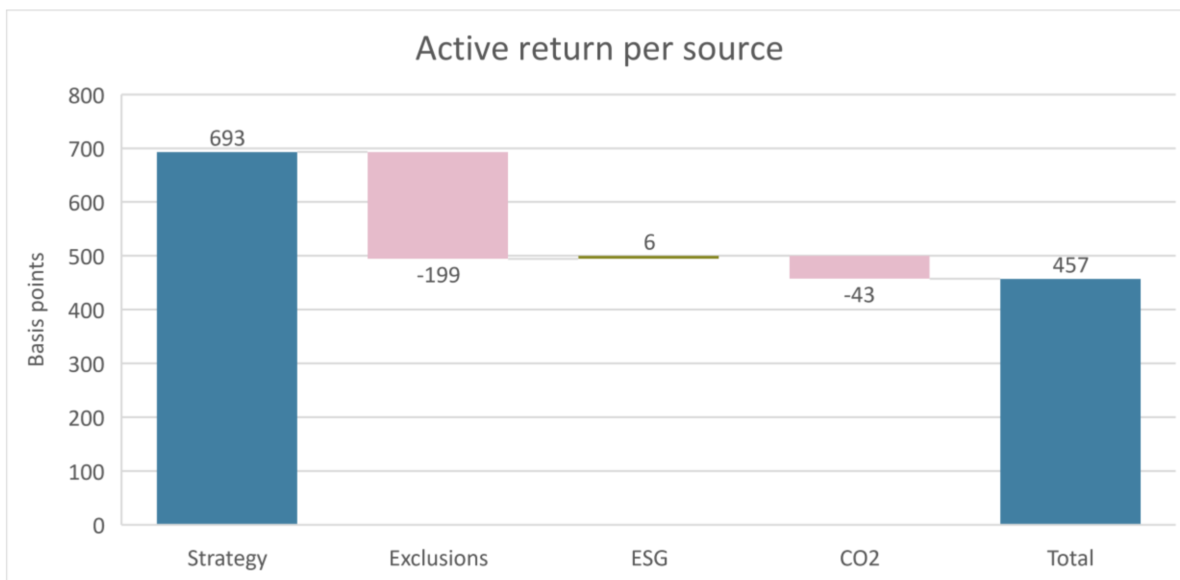

Figure 1: Decomposed active return by source
Source: Achmea IM

Figure 1 shows what can be accomplished by applying the Achmea IM methodology. The total return can be broken down into a return from: the investment strategy, exclusions, ESG scoring and CO2 reduction factors. These four factors are just an example, the Achmea IM methodology can use all kinds of factors that influence relative weights, such as different levels of

tracking error, country or sector limits, different levels of turnover restrictions, different investment universes etc. The possibilities are limited only by one's imagination.

The added value of this methodology lies in the transparency that it provides to all parties involved in the management of an investment portfolio. Based on this chart, the asset manager is able to show that the investment strategy that he or she employs is able to generate returns above the return that the portfolio has experienced, and that the difference is caused by the exclusions and, to a lesser extent, CO2 reduction goals.

The asset owner can use the output in the design of the non-financial factors, or discussions with beneficiaries about the impact of non-financial factors on the portfolio return. Investment consultants can advise on the construction of non-financial factors and supervisors can challenge the decisions made by the asset owners, all based on this methodology. Another main advantage of our approach is that it can accurately account for interactions occurring between exclusions and a manager's strategy. This even holds for the passive implementation of indices where ESG factors are applied to the portfolio, without being integrated into the benchmark that the portfolio is supposed to track.

In both active and passive investment management, exclusion impact is often estimated by simply reweighting the index without the excluded names by market capitalisation, effectively redistributing the excluded index weights proportional to the size of a company. While this approach seems straightforward, it neglects the interaction with the portfolio's strategy or other ESG choices. Neglecting the interaction between investment strategy and exclusions can cause quite substantial measurement errors as figure 2 depicts.

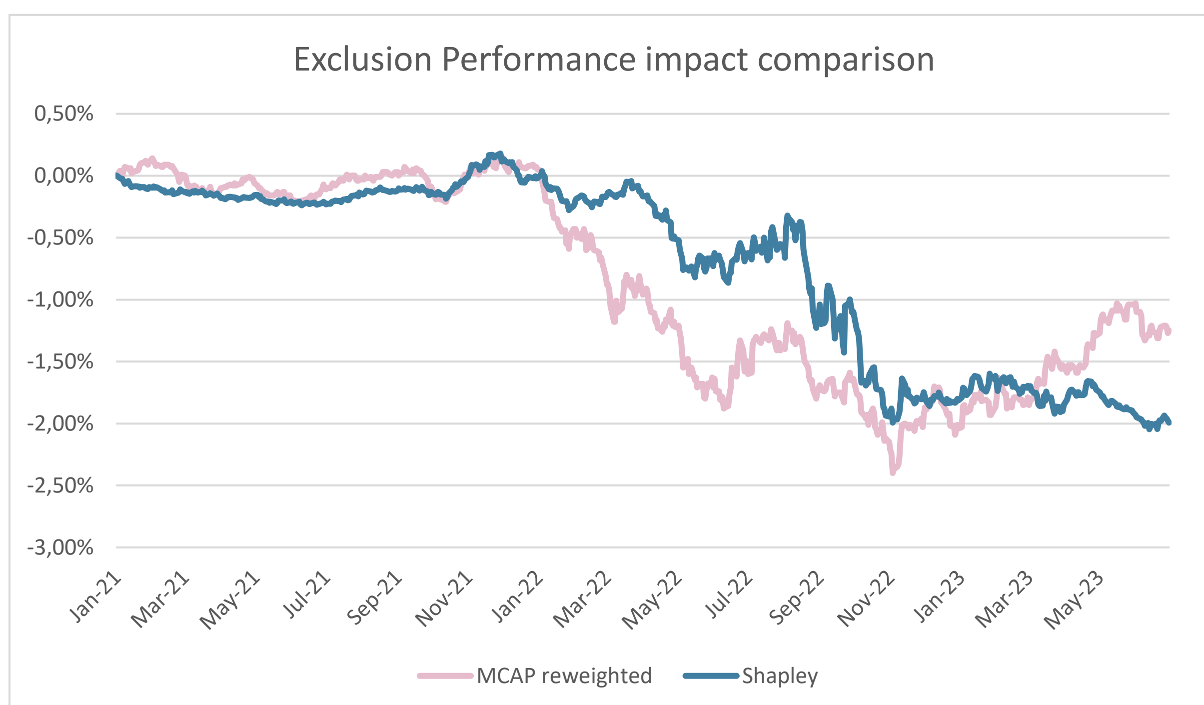

Figure 2: Exclusion performance impact comparison over 2021 / 2023H1
Source: Achmea IM

Furthermore, by looking at figure 3, it becomes apparent that the impact of the investment strategy on the total return of the portfolio has decreased over time. This insight can trigger a discussion between asset manager and asset owner on the design of the investment mandate. It could serve as a foundation to relax potential turnover or tracking error constraints. Alternatively, it can be an insight for an asset owner to change from active to passive management, as the majority of the excess return is generated by the asset owner's own decisions on non-financial factors, instead of by the investment strategy from the asset manager.

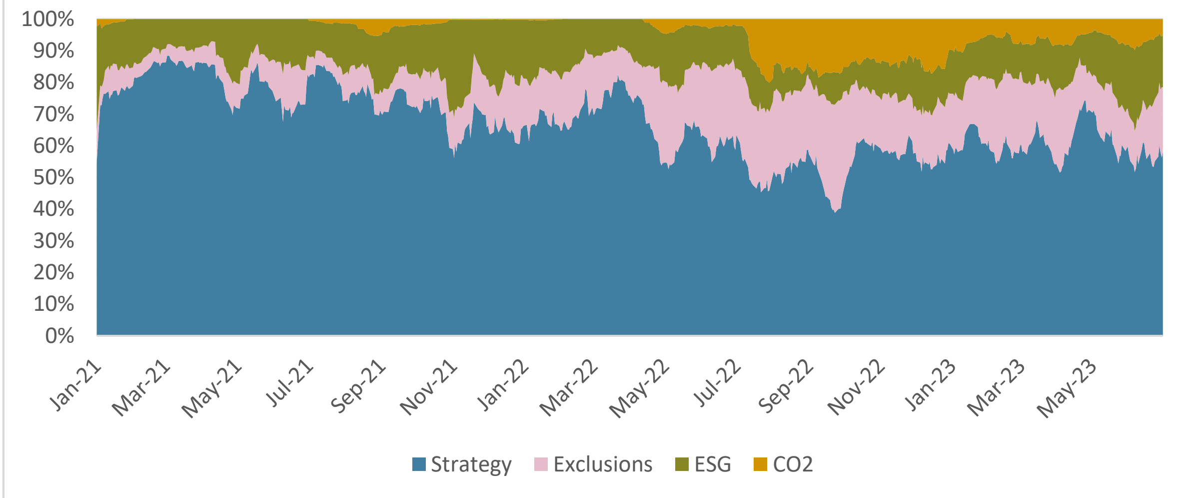

Figure 3: Active return explained by source
Source: Achmea IM

Methodology

The Achmea IM methodology is based on Shapley values. Shapley values are a powerful concept in the field of cooperative game theory and machine learning. They provide a systematic and fair way to allocate contributions among participants in a collaborative game. Whether assessing the worth of players in a team sport, attributing credit for a group project's success, explaining the importance of specific features in a machine learning model, or even attributing relative performance from an asset management product, Shapley values offer a comprehensive and equitable solution.
At its core, Shapley values were developed by Lloyd Shapley in the early 1950s as a means to distribute rewards fairly among participants in cooperative games. In these games, players work together to achieve a common goal, and each player's contribution can vary depending on the interactions with others. Shapley values seek to address the following question: "How much should each player receive as their share of the total payoff, considering their unique contributions within the context of cooperation?"

In the realm of machine learning, Shapley values have gained prominence due to their ability to interpret and explain model predictions. They offer a robust framework for understanding why a particular prediction was made, shedding light on the importance of individual features or input variables in determining the outcome. This interpretability is crucial in various applications, such as credit scoring, medical diagnosis, autonomous driving and investment management, where understanding the model's reasoning is vital for trust and accountability.

The key strength of Shapley values lies in their fairness and consistency. They follow three fundamental principles:

1. Efficiency: The total contribution of all players is equal to the overall outcome, ensuring that no value is left unaccounted for. This property guarantees a just distribution of rewards in cooperative games and accurate feature attribution in machine learning.
2. Symmetry: Shapley values treat all participants equally in terms of their contribution. Players with similar contributions receive equal rewards, fostering an equitable environment.
3. Linearity: The Shapley value of a coalition is the sum of the Shapley values of its individual members. This allows for a straightforward aggregation of contributions in complex scenarios.

Lloyd Shapley's groundbreaking work on Shapley values in cooperative game theory was recognised with the highest honour in the field of science and economics. In 2012, Lloyd Shapley was jointly awarded the Nobel Prize in Economic Sciences, along with Alvin E. Roth, for their outstanding contributions to the theory of stable allocations and the practice of market design.

This Nobel Prize underscores the profound impact of Shapley values, not only as a theoretical concept but also for their practical applications in solving real-world allocation problems, ranging from matching medical residents to hospitals, to fair resource distribution in various economic contexts, to the attribution of relative returns of an investment portfolio. Shapley's Nobel Prize win highlights the enduring relevance and significance of Shapley values in shaping the way fairness and decision-making in both economics and machine learning is approached.

Achmea Investment Management has been able to use this groundbreaking work to enhance the transparency of its performance attribution, allowing for better discussions about the guidelines of investment mandates, potentially leading to better investment returns.

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