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Mind the ESG capital allocation gap: The role of index providers, standard-setting, and “green” indices for the creation of sustainability impact

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Abstract

Environmental, social, and governance (ESG) funds are among the fastest-growing investment styles. ESG investing thereby has a governing effect, and a key open question is whether ESG merely reduces risks for investors or whether it can have a sustainability impact and actively contribute to climate transition. This governance through ESG is characterized by three potential transmission mechanisms: ratings, shareholder engagement, and capital allocation. These can create sustainability impact or constitute “ESG gaps” if transmission mechanisms remain ineffective/unutilized. Based on financial data, an investigation of ESG methodologies and expert interviews, we provide a novel ESG market analysis, focusing on the standard-setting role of a handful of ESG index providers in capital allocation. Our findings highlight that while “Dark Green” indices could have an impact, currently “Broad ESG” indices, which do not meaningfully facilitate sustainability, dominate investing: we call this the “ESG capital allocation gap.” This has important implications, because effective transmission mechanisms are crucial for ESG funds to achieve sustainability impact in the real economy.

Keywords: capital allocation, ESG, indices, standard-setting, sustainable finance, transmission mechanisms.

1. Introduction

Sustainable finance has been growing rapidly in recent years. This paper focuses on environmental, social, and governance (ESG) investment funds as a crucial pillar of sustainable finance. ESG funds, which primarily cater to retail investors, received record inflows of US\$650 billion in 2021, with asset managers expecting this trend to continue over the next decade (IIA, 2021). Essentially, these funds integrate ESG criteria into investment products—in addition to financial criteria. However, to date, ESG funds have been largely unregulated in how they create impact. Emerging regulations in the EU and the US have focused primarily on increased transparency through better disclosure and therefore the sustainability impact of funds labeled as “ESG” still remains unclear. Arguably the key open question is whether ESG investment merely reduces ESG risk for investors or whether it can have sustainability¹ impact on the behavior of firms into which ESG funds invest which subsequently translates into the broader economy and society, thereby actively contributing to climate transition. This governance through ESG is characterized by three potential transmission mechanisms: ratings, shareholder engagement, and capital allocation. These can create sustainability impact or constitute “ESG gaps” if transmission mechanisms remain ineffective/unutilized. By analyzing the standard-setting role of index providers—private actors that define stock market indices—with respect to capital allocation as an important transmission mechanism for sustainability impact, this paper sheds light on an important dimension of this question.

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In industry and policy debates ESG investing is often framed as playing a significant impact for advancing sustainability and tackling climate change. However, ESG as a concept, the underlying criteria and the potential benefits are highly controversial (Baines & Hager, 2022; Buller, 2020; Caldecott et al., 2022; Crona & Sundström, 2022; Kölbel et al., 2020; Pollman, 2022). As there is no internationally recognized definition of what constitutes an ESG fund, estimates of global ESG assets differ enormously (see Table 1). According to the Global Sustainable Investment Alliance (GSIA), sustainable investment funds have reached US\$35.3 trillion in assets under management (AuM) in 2020, a 55% increase since 2016 which would amount to almost 36% of all professionally managed assets. This surprisingly high figure results from the fact that GSIA (2020; emphasis added) defines sustainable investing very loosely as “an investment approach that *considers* ESG factors in portfolio selection”—which is known as “ESG integration” or “Broad ESG.” In contrast, Morningstar puts the value of assets in “sustainable” funds at only US\$2.03 trillion for September 2021 (Quinio, 2022)—less than one tenth of GSIA’s estimate. Clearly, ESG is a very fuzzy term. This is primarily due to the vague category of “ESG integration,” which means in practice that “managers may be ‘aware of’ and ‘take into account’ ESG factors when making investment decisions (...). But they’re not necessarily compelled to act on that information” (Kishan, 2020).

One key reason for the confusion and controversy around ESG is arguably that there is no public regulation which precisely defines ESG. In the absence of such public regulation defining the parameters of sustainable finance, we demonstrate how a market-driven, entrepreneurial standard-setting by leading ESG firms has emerged. Over the last 20 years, this *governance of ESG* was shaped by a burgeoning private industry for ESG investment tools (data, ratings, and indices) which consolidated into a handful of globally dominant firms (ESMA, 2022; European Commission, 2020). While existing literature has largely focused on ESG data and ratings, this paper focuses on the hitherto unexplored role of index providers and ESG indices. We argue that the largest ESG index providers and benchmark administrators have de facto set the international standards of how funds have to be structured for qualifying as “ESG” or “sustainable.”

Importantly, these private ESG standards have governing effects on corporations and thereby potentially influence the sustainability of the “real” economy. This *governance by ESG* can operate via three potential *transmission mechanisms*: (1) ratings, (2) shareholder engagement, and (3) capital allocation (see Caldecott et al., 2022; Wilkens et al., 2022). By employing these mechanisms, ESG investing can either have sustainability impact or constitute what we call “ESG gaps” if they remain ineffective or unutilized. Without sustainability impact ESG investing would not have significant positive effects on the real economy, which, however, are widely assumed by regulators, policymakers, and civil society (Caldecott et al., 2022). This *governance by ESG* and the role of the *transmission mechanisms* are crucial elements of sustainable investing that have so far largely been neglected by research and public regulation alike.

The purpose of this paper is thus twofold. First, we analyze the *governance of ESG* by highlighting the crucial role of indices for private standard-setting in ESG investing. Second, we discuss the *governance by ESG* through transmission mechanisms via which sustainability impact on publicly listed companies could take effect. While existing research has largely focused on ratings and shareholder engagement, we focus on capital allocation.

Table 1 Estimates of global ESG investment assets

Data provider	ESG investment estimate	Further information
Bloomberg	\$793 billion (2022)	ESG funds; dataset from Bloomberg Terminal compiled with “Fund Screener” function
Morningstar	\$2030 billion (2021)	All sustainable investment funds
Broadridge	\$8000 billion (2021)	All fund assets (mutual funds, ETFs, institutional mandates, private funds)
Global Sustainable Investment Alliance	\$35,301 billion (2020)	All ESG assets, including ESG integration (\$25,000 billion)

¹ Source: Data collected by the authors.

Capital allocation is crucial because it can have a real-world effect by directly creating “decarbonization selling pressure” (Rohleder et al., 2022) and more indirectly via supporting divestment and its effects on the ongoing public discourse shift regarding fossil fuels (Bergman, 2018). In our research, we identify the pivotal role of a highly concentrated group of index providers, such as MSCI, and their ESG indices in setting the standards of what is generally accepted as “sustainable” investing and for steering investment toward more (or less) sustainable capital allocation.

In addition to secondary literature and policy documents, our analysis draws on an extensive dataset on ESG funds ($n = 1110$) combining various data sources (Bloomberg Terminal, Market Insider, Morningstar, ESG fund/index prospectuses). With this data, we conduct an analysis of the ESG funds industry, identifying the most influential firms in setting standards for sustainable investment. This quantitative data are complemented with qualitative data from semi-structured interviews with industry experts and practitioners ($n = 11$) which provided important contextual information about the ESG industry, its regulation, the significance of indices, and the pre-dominant role of MSCI for standard-setting. Thereby, these interviews increased the internal validity of how we interpret the findings from our ESG fund data analysis.² Our findings highlight that while ESG indices could have a sustainable effect via capital allocation (through “Dark Green” indices), currently most ESG indices (“Broad ESG” indices) do not meaningfully facilitate sustainability. We call this the “ESG capital allocation gap.” These findings have important implications, because without effective transmission mechanisms ESG funds cannot have any sustainability impact on the firms in their portfolio and the broader economy.

At the moment, we are arguably in a transition between the unregulated entrepreneurial phase of the ESG industry and a more regulated period that is emerging with both EU and US regulators launching incremental regulatory initiatives concerning ESG (Caldecott et al., 2022; Chiu, 2021). However, the regulation so far seems to be built upon the market standards for ESG funds that had been set by private market actors and only seeks to “fine-tune” these through better disclosure practices. Put differently, market-driven ESG standards set by a handful of private actors (which crucially include the fuzzy category of “ESG integration”) have likely “pre-structured” regulatory initiatives.

This paper is structured in five sections. Section 2 discusses the relationship between governance and ESG, including the history of ESG investing (governance of ESG) and potential ESG transmission mechanisms (governance by ESG). Section 3 provides a novel analysis of ESG funds and indices with respect to capital allocation. Section 4 focuses on how ESG indices are constructed and why their methodologies matter for ESG transmission mechanisms. The final section concludes.

2. Governance and ESG

There are two distinct but interconnected aspects when it comes to the relationship between governance and finance: the “governance of” and the “governance by” finance. On the one hand, there is the question of how finance itself is governed. This has been a long-standing debate regarding the roles of and interactions between public and private actors in the governance and regulation of financial markets (Helleiner, 1996; Moschella & Tsingou, 2013; Underhill & Zhang, 2008; Young, 2013). Historically, finance has frequently been characterized by private self-governance in which financial industry actors have “provide[d] the rules or help[ed] public sector regulators in the formulation and implementation of policies” (Moschella & Tsingou, 2013). Market concentration (Büthe & Mattli, 2011), private authorities (Sinclair, 2005), and industry associations (Porter, 2011) play key roles in setting the standards that govern finance (Young, 2013). While some parts of the financial system have seen increased public oversight and regulation post-GFC, many private, market-based mechanisms of standard-setting/governance remain intact. As Section 2.1 highlights, the case of ESG mirrors this market-based “governance of finance”—with private governance of ESG through standard-setting emerging once ESG turned from a niche to a mainstream phenomenon in the mid-2000s. This market-driven development of ESG indices is essential for understanding why certain ESG indices have become the de facto standard for “sustainable” investing.

On the other hand, finance itself has a governing effect through its intermediating role—financial markets can have an important impact on corporations by setting standards for corporate governance (Cioffi, 2009; Lazonick & O’Sullivan, 2000; Sinclair, 2005). Importantly, this “governance by” finance can lead to very different outcomes. As Monciardini and Conaldi (2019) outline, corporate governance regimes can be either

public-oriented by considering labor/stakeholders or shareholder value-oriented. Creating a framework for studying the *governance by ESG*, Section 2.2 outlines the potential transmission mechanisms through which ESG investing can have sustainability impact on corporations.

2.1. Governance of ESG: From Sustainable Finance 1.0 to 3.0

The governance of ESG can be broadly separated into three historical phases, which range from its unregulated beginnings, a period marked by market-based private standard-setting to the current period of emerging public regulation—with ESG indices playing a more important role in each new phase. The origin of ESG investing can be seen in the anti-apartheid movement when investors from Europe and North America sought to avoid investment in companies active in South Africa. Even earlier attempts to do “socially responsible investing” focused on excluding so-called “sin stocks” (alcohol, tobacco, etc.) from investment portfolios and have been mainly pursued by religious groups (Camilleri, 2017). Busch et al. (2021) have called this first period of “sustainable” investing that relied exclusively on avoiding exposure to unethical firms “Sustainable Finance 1.0.” This approach to fully or partially exclude specific firms or entire industries (e.g., coal) is still an integral part of ESG investing today and is referred to as “negative screening” (see Deutsche Bundesbank, 2019; Kölbel et al., 2020). The first ESG index, the Domini 400 Social Index, was launched by KLD Research (part of MSCI since 2010) in 1990 but ESG indices (as well as sustainable investing in general) played an insignificant role in this early period; by 1994 investors had access to just 26 sustainable funds with US\$1.9 billion of assets (Blackbaud, 2021). Overall, this “sustainable” investment style developed largely outside of public regulation and was shaped by individual market actors albeit no shared or rigorous industry standards developed at the time. The capital allocation of these early sustainable funds was primarily determined by the individual investment decisions of fund managers and not by ESG indices.

The “Sustainable Finance 2.0” era was characterized by the development of sustainable investing from a niche phenomenon into mainstream investment products (Busch et al., 2021). The term ESG was coined in 2004 in a report by the United Nations Global Compact (Pollman, 2022) followed by the UN Principles for Responsible Investment (PRI) in 2006. But while the PRI created a broad framework for sustainable investing, it did not provide specific definitions or standards for ESG. In the absence of such public regulation, this period saw the dynamic development of various ESG ratings, data, and indices as tools of private self-governance for this growing area of finance and their consolidation into a few big firms that provide these tools (Dimmelmeier, 2020; Escrig-Olmedo et al., 2019). In this new period of sustainable investing, the primary purpose was not to avoid unethical firms, but mainly to manage financial risks related to ESG factors (Eccles et al., 2020). Arguably the launch of the first ESG ETFs (exchange traded funds) in the early 2000s marks the beginning of this period, as ETFs are easily tradable investment products aimed at retail investors (Braun, 2016; Fichtner et al., 2017). ETFs are financial instruments that passively track financial indices, which enabled them to have significantly lower fees than actively managed funds. This delegation of the capital allocation strategy away from fund managers to indices has fundamentally reshaped investing to the extent that important “benchmark” indices are increasingly also affecting the capital allocation of active funds (Petry et al., 2021). In the Sustainable Finance 2.0 period, small retail investors and large institutional asset owners increasingly invested in “mass market” ESG funds facilitated and standardized primarily by the “sustainable” indices developed by a small group of ESG index providers. This standardization via indices is crucial, because it enabled the rapid growth of ESG investing. These ESG standards are an example of “market-based” private regulation, in which firms “establish their preferred technologies or practices as the de facto standard through market dominance or other strategies” (Büthe & Mattli, 2011: 14; see also Green, 2010, 2014). Importantly, in this period the focus has been almost exclusively on managing ESG risks of investors.

According to Busch et al. (2021), the 2015 Paris Agreement marks the transition toward “Sustainable Finance 3.0.” The advent of the UN sustainable development goals (SDGs) and the increasingly understood urgency to keep global warming below +2.0°C induced a stronger focus on the positive real-world *impact* of sustainable finance. The risk-focused approach that dominated the previous era can also be described as “outside-in” or “input ESG” and reflects what is called “single materiality” in accounting. Single materiality is an approach that accounts for how sustainability factors affect the financial value of a company, whereas double materiality also

takes into account how the company affects society and the environment. ESG investing that seeks to create a positive sustainability impact can consequently be described as “inside-out” or “output ESG.”

In this new period policymakers and regulators, especially in Europe and (to a lesser extent) the US, have increasingly become involved with ESG investing (see Section 4). Nevertheless, regulation has primarily sought to incrementally improve the market-driven standards of how “sustainable” funds must be structured in order to be considered as such. This period has also been called the “age of passive asset management” in which benchmark indices and the major index providers increasingly shape the capital allocation of many investors (Jahnke, 2019a, 2019b; Petry et al., 2021). We argue that ESG indices that are created within a highly concentrated group of index providers play a so far neglected role in standard-setting for the capital allocation of ESG investors which has important governing effects on the companies into which ESG funds invest. For Busch et al. (2021: 33) a central question in this current phase of sustainable finance is: “which investments are real-impact investments and which ones are not?” (see also Crona & Sundström, 2022); this point is also being stressed by practitioners (see Keeley, 2023). However, scholarly work on such investment impact and the mechanisms through which it is supposed to be achieved is still limited.

2.2. Governance by ESG: The (potential) transmission mechanisms

In a similar fashion to research on finance’s influence on corporate governance practices (Cioffi, 2009; Monciardini & Conaldi, 2019), this paper aims to assess the governing effects of ESG funds, particularly: How can ESG investing create sustainability impact? According to Wilkens et al. (2022: 5), “sustainable investments have an impact if they themselves have a positive effect on reality (such as the real economy, the environment, and society) regarding the respective sustainability goal (‘additivity’).” Consequently, we define sustainability impact as when ESG funds have significant positive effects on the ESG profiles of the firms in their portfolio. In other words, sustainability impact is a change in companies’ behavior and real-world outcomes caused by ESG funds (see Busch et al., 2021). As Caldecott et al. (2022) noted, it is much less important to discuss which assets can be considered “green” or “sustainable” but rather *how* financial products seek to improve sustainability. Put differently, one needs to consider the *transmission mechanisms* through which ESG investing can influence the actions of listed companies.

In the absence of public regulation, market-based standard-setting determined the effectiveness of these mechanisms in governing corporate behavior in what we refer to as the “ESG investment chain” (see Arjalies et al., 2017). Investment (shown as bold arrows in the figure) flows from asset owners via the ESG funds provided by asset managers into the stocks (or bonds) of publicly listed firms (Fig. 1). Asset owners pay fees (shown as narrow arrows) to asset managers; asset managers pay fees to ESG providers to use their ESG indices/benchmarks or ratings. Particularly noteworthy is the crucial role that indices play in this age of asset management (see Fichtner et al., 2022; Jahnke, 2019a, 2019b; Petry et al., 2021). Active ESG funds usually have a non-ESG benchmark index against which their performance is being evaluated, while passively managed ESG funds directly

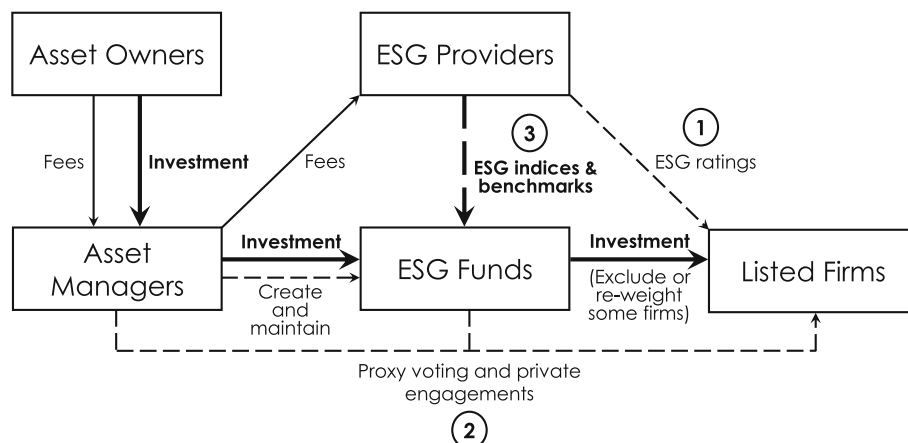


Figure 1 The ESG investment chain and potential transmission mechanisms. Source: Authors.

replicate a specific ESG index. Indices and their underlying criteria are thus located at a focal point in the ESG investment chain, both within active and passive investment styles.

Overall, there are three potential transmission mechanisms for sustainability impact by ESG funds (see Wilkens et al., 2022 for a literature overview): (1) ratings, (2) shareholder engagement, and (3) capital allocation (see Fig. 1). If the mechanism is effective and utilized, it can have a sustainability impact. If the mechanism does not work or is not utilized effectively, we observe an “ESG gap,” i.e., the “ESG ratings gap,” the “ESG shareholder engagement gap,” and the “ESG capital allocation gap.” Each of these mechanisms, albeit interconnected, works at a different part of the ESG investment chain:

- 1 The ratings mechanism provides investors with tools to make informed decisions about sustainable investing, namely through using ESG ratings and data; this mechanism also includes potential indirect impacts on companies by incentivizing them to improve their ESG ratings. These indirect company rating impacts also comprise stigmatization, endorsement, and (ESG) benchmarking (Kölbel et al., 2020). However, there is currently neither public regulation nor private self-regulation (e.g., through industry standards; see Young, 2013) of the underlying ESG ratings. In addition, internationally standardized reporting requirements for listed firms to disclose ESG-relevant information, such as greenhouse gas emissions, have not yet been developed. Consequently, ESG ratings are hugely inconsistent, a fact that has been pointed out by several scholars.

Reportedly, there are over 150 ESG providers globally (Pollman, 2022), albeit only a few large firms matter (ESMA, 2022). The global market leader by far is MSCI with an estimated market share of 40%, putting the firm way ahead of competitors such as ISS ESG and Sustainalytics (Simpson et al., 2021). But even when comparing the ratings of these large ESG rating providers, researchers found striking divergences in their key building blocks (scope, measurement, and weightings)—or, in other words, “aggregate confusion” (Berg et al., 2022; also Billio et al., 2020). Further, as Crona et al. (2021: 620) have argued ESG ratings in their current form capture primarily financial or single materiality (i.e. financial risk) and largely fail to account for double materiality, that is, investment externalities (aggravation risk) that play a crucial role for climate change and other sustainability issues. In the words of Simpson et al. (2021), ESG ratings do not capture “a company’s impact on the Earth and society. In fact, they gauge the opposite: the potential impact of the world on the company and its shareholders.” Put differently, ESG ratings are about input ESG (outside-in), not output ESG (inside-out). While investors might use ESG ratings, they do not necessarily trust them as investor surveys show (e.g., PwC, 2021). Hence, for ratings there are no standards of what ESG actually is. We call this the “ESG ratings gap.”

A recent OECD study (, 2020) highlights this “ESG ratings gap” by demonstrating the great discrepancies between ESG ratings and credit ratings. While the variance of different credit ratings for individual companies is minimal, ESG ratings diverge hugely. More recent regulatory initiatives like the EU taxonomy for sustainable activities may help to establish which corporate activities are sustainable from an ESG perspective. However, major difficulties remain and to date the ratings mechanism does not have a consistent sustainability impact while the incoherence of ESG ratings prevents standard-setting capabilities.

- 2 The ESG transmission mechanism via shareholder engagement includes two components: exercising voting rights to influence corporate activities and exercising pressure on top management, so-called private engagement. In their literature review, Kölbel et al. (2020) found moderately high success rates of shareholder engagement (18%–60%). Hence, in principle, shareholder engagement might be a strong transmission mechanism for ESG funds to have a positive real-world impact (see Busch et al., 2021; Krahnen et al., 2021). However, ESG funds (which primarily cater to retail investors) are entirely defined by what Busch et al. (2021) call “pre-investment approaches,” such as exclusions and “best-in-class.” Post-investment approaches, such as voting and engagement are rarely defined in ESG funds’ prospectuses as integral components for creating sustainability impact. We call this the “ESG shareholder engagement gap.”

This is supported by previous research on proxy voting, which has found that historically large asset managers tended to vote all their funds (active, passive, and ESG) similarly (Fichtner et al., 2017; Lipton, 2017) and have also voted mostly against ESG shareholder proposals (Baines & Hager, 2022; de Groot et al., 2021; Golland

et al., 2022; Griffin, 2021). Other recent research, however, has found indications that ESG funds are beginning to vote differently from non-ESG funds (Dikolli et al., 2022; Quinn et al., 2021). Azar et al. (2021) have provided first evidence that private engagements by big asset managers have been associated with decreased GHG emissions of the engaged firms in subsequent years. More research is needed on both proxy voting and private engagements linked to ESG, but it seems clear that shareholder engagement constitutes an important potential transmission mechanism for sustainability, which could be facilitated and made much more transparent by mandatory industry standards. However, the existing literature demonstrates that in the absence of both public and private regulation, shareholder engagement is subject to the individual decisions of investors.

- 3 The ESG capital allocation mechanism steers investment into pre-defined sustainable investment categories, namely through ESG indices and benchmarks—with the concomitant divestment from non-sustainable shares creating a negative impact on, for example, fossil fuel firms. Divestment is the major element of *capital allocation* and constitutes a potential transmission mechanism from financial markets to the real economy insofar as it could increase the cost of capital for companies whose stocks are being divested (see Zerbib, 2022). In the existing literature, some researchers found that divestment campaigns have had no significant financial impact for fossil fuel firms so far (Hansen & Pollin, 2020), while others report that divestment may have a sizeable impact (Hong & Kacperczyk, 2009; Kölbel et al., 2020). Especially more recent work demonstrates how divestment pledges from oil and gas companies are associated with lower capital flows to such firms (Cojoianu et al., 2020) as mutual funds can have a very significant effect on firms' stock prices through what Rohleder et al. (2022) call “decarbonization selling pressure,” supporting the thesis that divestment may have a strong sustainability impact. Overall, as Wilson and Caldecott (2021) emphasize, “capital allocation is a key transmission mechanism to drive alignment with climate outcomes” since it can affect asset prices and the cost of capital faced by companies in the real economy (see also Caldecott et al., 2022). However, existing studies have not yet analyzed the crucial role of standard-setting within the ESG capital allocation mechanism and instead mostly focused on the ESG ratings and shareholder engagement mechanisms. In this paper, we contribute to this debate by specifically analyzing indices and their standard-setting capabilities for ESG funds.

3. Capital allocation and ESG funds: Who sets standards for sustainable finance?

While current discussions of ESG have shed light on the ESG ratings and shareholder engagement mechanisms, contemporary scholarship has not yet adequately addressed issues of capital allocation with respect to the global ESG industry. In particular, the issue of how sustainability is defined with respect to capital allocation has so far not been investigated. Is this a level playing field with strong competition or do we have highly concentrated market structures—like credit rating agencies (Sinclair, 2005)? Do we have a situation where the “Big Three” asset managers dominate the ESG funds landscape similar to the situation in non-ESG index funds (Fichtner et al., 2017) or do we see more dispersed market structure? On which basis are funds conducting sustainable investment—are they pursuing benchmark-agnostic active strategies or are they relying on indices/benchmarks? Which indices are utilized by funds and what are the methodologies behind them? These questions are essential because they shape the capital allocation of ESG funds, which determines whether they create sustainability impact or not.

We therefore compiled a dataset of existing ESG funds by extracting the data of all investment funds that are classified as ESG (including “socially responsible” and “environmentally friendly”) in the Bloomberg Terminal. For this, we used the “Fund Screener” function, which scans all available funds listed in the database. The resulting dataset contains data on 1110 ESG funds with total AuM of US\$793.21 billion (as of 10 February 2022).³ As the definition of what is and what is not considered ESG is subject to ongoing debates and discussions, we decided to base our calculations on Bloomberg Terminal data for several reasons. First, the total sum of ESG funds in our dataset (\$793 billion) is at the lower end of the spectrum of estimates of how much AuM are allocated to ESG funds (see Table 1), allowing for a more precise analysis, and excluding many “ESG integration” funds that increase the size of the ESG industry while having a small or non-existent sustainability impact. If ESG investing has a sustainability impact through capital allocation, it would be much more easily observable in

this focused dataset. Second, Bloomberg data allow us to link ESG funds with the issuing entities (fund managers) and—most importantly—the underlying ESG indices that are being tracked (passive funds) or used as benchmarks (active funds). This enables us to calculate the market concentration of ESG index providers and ESG asset managers (after manual data completion). This is particularly important for our analysis as we posit that these firms could effectively steer capital along the lines of what they set as standards of sustainability.

Following the initial fund screening, we then analyzed the 250 largest ESG funds in closer detail. We focus on the 250 largest funds as the data extracted from Bloomberg were partially incomplete. We thus manually added missing data on underlying indices and benchmarks as well as researched additional data points on tracking errors and active share from individual fund websites, prospectuses, and other financial databases (e.g., Markets Insider, Morningstar, iShares). Since these 250 largest ESG funds account for 84.3% of AuM from our total dataset ($n = 1110$), we consider them a sufficient basis for our analysis.⁴ These funds were analyzed based on the following categories: active or passive management; asset type; underlying benchmark (active funds) or index (passive funds); index provider; management company; total AuM; tracking error and active share. Subsequently, we calculated the market share of index providers and asset managers within the respective dataset. Finally, we categorized ESG indices according to their sustainability impact potential on the basis of coded classifications provided by index providers (see Section 4). This dataset thus allows us to analyze a large part of the ESG fund universe and to identify the most important actors, their market share in the different segments, and their potential to set standards for sustainable investing.

Crucially, high market concentration is a key precondition for any group of firms to have international standard-setting capabilities (Büthe & Mattli, 2011). While we only see a moderate concentration among fund managers, we show that ESG indices created by a handful of ESG index providers are what matters when it comes to shaping ESG capital allocation. Specifically, our dataset enables us to analyze the role of indices regarding the ESG allocation mechanism and to pinpoint whether specific actors have the ability to set de facto standards on what constitutes sustainable investing and shape its impact.

3.1. Capital allocation and asset managers: The hidden power of ESG indices

The first finding from our dataset ($n = 1110$) is that 71.8% of funds (by AuM) are actively managed and 28.2% are passively managed. Importantly, passive investment into ESG funds has been rapidly growing in recent years, with their share of ESG funds increasing by more than 400% since 2017 and hence contributing most to the expansion of ESG funds (Leaders Arena, 2020). This development is observable in both the US and EU and is also in line with existing research on the ongoing shift from active to passive investment and its broader consequences for corporate governance and sustainability (Braun, 2016, 2021; Fichtner & Heemskerk, 2020; Galaz et al., 2018; Haberly et al., 2019; Jahnke, 2019a, 2019b). However, in contrast to the “Big Three” asset managers which dominate non-ESG equity funds our analysis indicates only a moderate degree of concentration for ESG fund managers. While five asset managers hold 47% of the total market share in our dataset (Fig. 2), the remaining assets are rather dispersed among a broad range of companies.

This picture changes when dividing the dataset into active and passive funds. Whereas observations in the active segment only slightly deviate from the overall concentration, with five companies holding 46% of AuM while the rest is rather dispersed, the passive segment is much more concentrated. Here, BlackRock manages 45.5% and only few other asset managers have relevant market shares. However, as previous research has found, passive asset managers are essentially delegating their investment decisions to those companies that provide the indices that their funds track (Jahnke, 2019b; Petry et al., 2021). So, while we can observe high market concentration, this does not translate into standard-setting capabilities for capital allocation. We therefore posit that passive asset managers do not significantly influence capital allocation due to their reliance on ESG indices.

In contrast, the active ESG segment is too fragmented to lead to the formation of standard-setting capable asset managers that define ESG investing—first-placed Fidelity having only about 16% market share. Moreover, it is worth noting that active managers use indices as performance benchmarks for their portfolios. Importantly, 87.9% of active ESG funds utilize non-ESG indices as benchmarks for their investment, while only 3.7% use ESG indices⁵ and 8.4% do not disclose their benchmarks. This means that the baseline against which they assess their

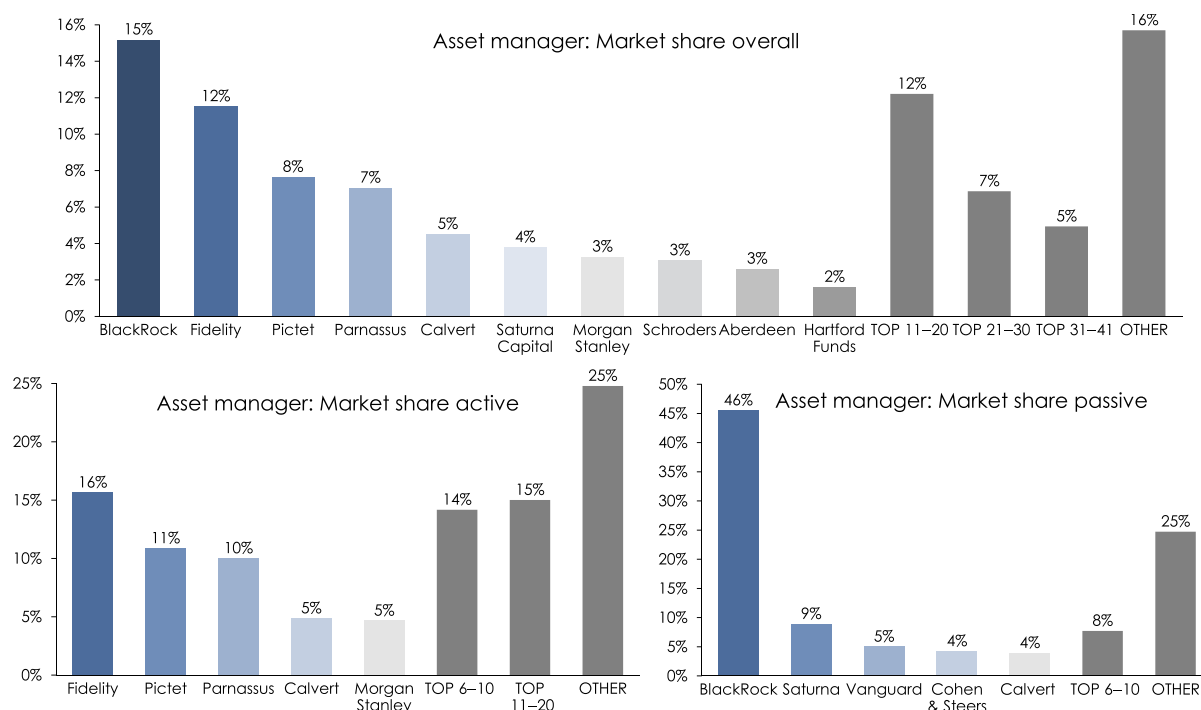


Figure 2 Market share of ESG funds by asset manager (upper figure = total; bottom lhs = passive; bottom rhs = active). *Source:* Authors' calculations based on Bloomberg Terminal.

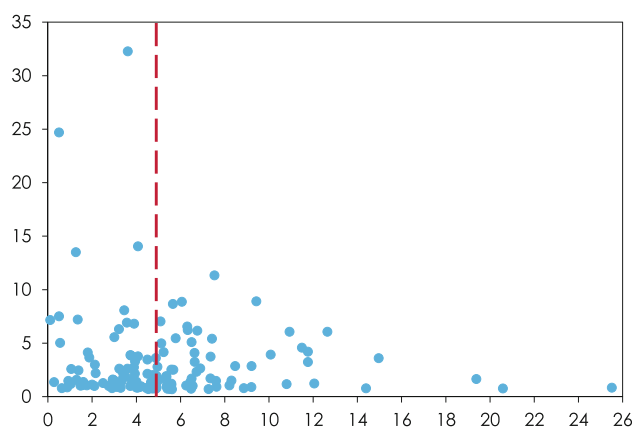


Figure 3 Tracking error of active ESG funds (x-axis; in %) and fund AUM (y-axis; in US\$ billion). *Source:* Calculations by the authors.

performance is decidedly non-sustainable and they would have to substantially deviate from their benchmarks to have a sustainable capital allocation impact.

However, as a closer analysis of the active ESG funds in our dataset highlights, active managers hardly deviate from their non-ESG benchmarks. The weighted average tracking error between active ESG funds and their non-ESG benchmarks is only 4.88% (Fig. 3), with especially larger funds closely following their respective benchmarks, a phenomenon called “index hugging.” ESMA (2016) considers up to 4% as “index hugging,” while truly benchmark agnostic investing has much higher tracking errors of above 8%.⁶ The low tracking errors are arguably due to what Petry et al. (2021: 162) called the “pull effect” that indices have on active management, since indices now mechanically move ever larger parts of capital markets. Similar to passive funds that track indices, active ESG funds are thus to a large extent effectively delegating their investment decisions to index providers.

Overall, our data suggest that asset managers on their own are unlikely to impact ESG capital allocation directly and meaningfully. Their activities will thus probably not translate into effective sustainability impact. Instead, they are to a large extent relying on ESG indices for their investment decisions. These, in turn, are supplied by index providers. As the next sub-section demonstrates, index providers have standard-setting power to define what is considered as sustainable impact in the realm of capital allocation.

3.2. Capital allocation and indices: Setting ESG standards

Globally, there are over 150 companies that provide ESG data, indices, and ratings (Pollman, 2022). But while ESG ratings do not have a large sustainability impact on ESG funds (Section 2.2), our findings suggest that ESG indices are much more consequential.⁷ The purpose of indices is to display the performance of a specific economic entity such as a nation's stock market (e.g., S&P 500) in one single number that is relatively easy to understand and comparable over time. Index providers—the companies that construct indices—have a particularly salient role in capital markets as their decisions whether assets are included or excluded from indices have a strong influence on capital allocation (Fichtner et al., 2022; Jahnke, 2019a, 2019b; Petry et al., 2021).

This is also the case for ESG investment. A survey by the Index Industry Association (IIA, 2021) highlights that 88.1% of investors use ESG indices as the basis for their investment strategies, with ESG indices being either a core part of all (56.3%) or most (31.8%) of their portfolios. Investors track indices for their investment strategies (39.2%), use them as benchmarks (40.4%), or both (19.0%). ESG indices therefore matter as they define which stocks (i.e., companies) are “sustainable” and which are not. As one interviewee working in ESG product development for a stock exchange noted, “essentially, the index providers define the rules of the game.”⁸ In addition, we argue that a high concentration in the market share of individual index providers would translate into standard-setting capability over what is considered as ESG and what is not.⁹ Such a capability would enable direct influence over whether sustainable finance will help mitigating climate change and other pressing issues or not, because such de facto standard-setting would significantly influence the capital allocation of ESG funds.

The analysis of our dataset shows a very high concentration in the market for index provisions in both active and passive investing (Fig. 4). In passive investing this translates to directly steering capital allocation as index funds fully replicate ESG indices. But this is also highly relevant for active funds, as our analysis above (see

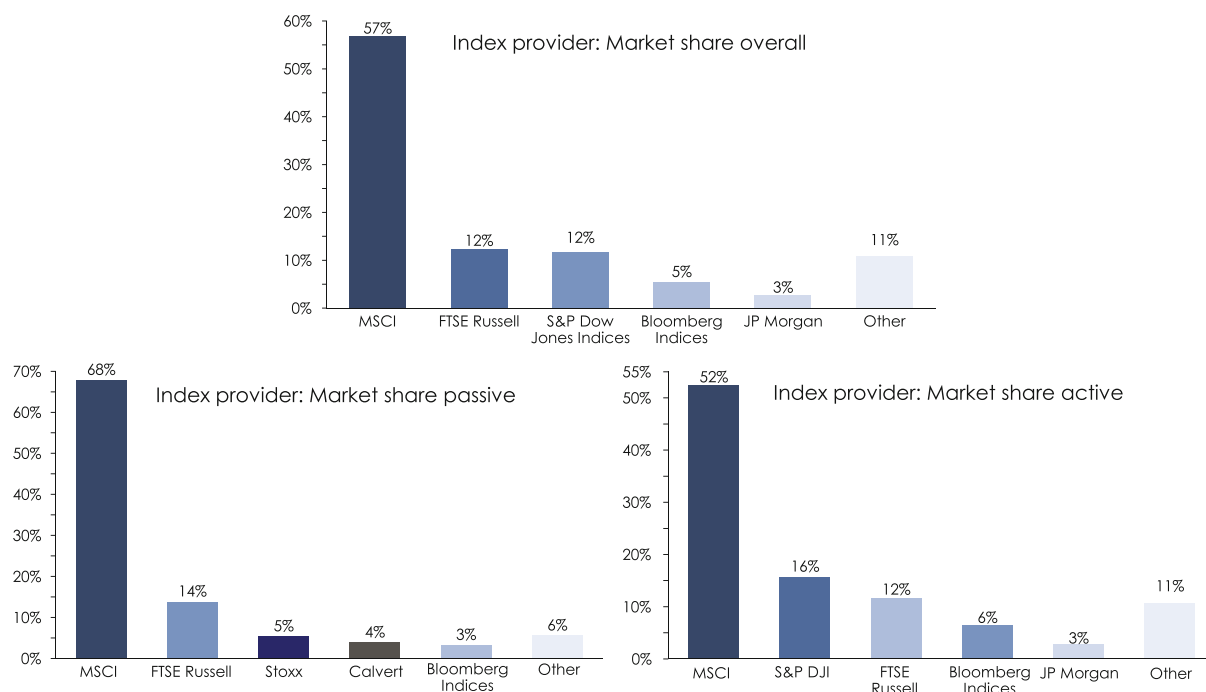


Figure 4 Market share of ESG funds by index provider (upper figure = total; bottom lhs = passive; bottom rhs = active). Source: Authors' calculations based on Bloomberg Terminal.

Fig. 3) has found very low tracking errors for most actively managed ESG funds, which means that they diverge only slightly from their non-ESG index benchmarks. Hence, indices also determine the capital allocation of active ESG funds.

In both segments, the market is in essence controlled by five companies which are slightly diverging between passive and active funds. In the active segment, the five largest ESG providers hold 88.9% of the market share, while in the passive segment 93.6% of the AuM are based on indices by the five largest providers. MSCI has a particularly prominent role with an overall market share of 56.8%, respectively 52.4% in the active and a striking 67.9% in the passive segment.¹⁰

The ESG index industry is thus characterized by a highly concentrated market structure, where especially one firm—MSCI—has emerged as by far the most dominant provider of ESG indices. Partially, this is because MSCI is one of the very few fully integrated firms that are leading providers of ESG ratings, data as well as indices, which creates strong synergistic “network” effects within the investment chain (Arjalies et al., 2017; Petry, 2021).¹¹ Another factor that facilitated MSCI’s dominant role was to construct its indicators in a very market-friendly way. After acquiring KLD and Innovest as two of the then largest ESG index providers in 2010, MSCI adopted the financial “value-oriented” ESG methodology of Innovest and largely abandoned KLD’s “values-driven” ESG methodology (Eccles et al., 2020). Crucially, the former methodology was much more compatible with financial metrics, including indices, complementing its synergistic business model. First-mover advantage via acquisitions, combined with large economies of scale and scope, and choosing a market-compatible approach paved the way for MSCI’s success.¹² By deciding which assets are included into ESG funds via its indices, MSCI effectively defines what counts as ESG investment and could thus become a new kind of “focal institution” in this issue area (Büthe & Mattli, 2011). As one interviewee noted, “MSCI is leading in ESG, they are setting the standards,”¹³ a point that was confirmed by several interviewees.¹⁴

More than merely leading the market, MSCI is de facto setting global ESG investment standards via the indices the firm is providing. ESG indices are the tools through which—in principle—sustainability impact could be achieved via capital allocation. However, it is still unclear whether this transmission mechanism is effective. We therefore need to investigate more closely according to which methodology MSCI (and other index providers) construct their ESG indices.

4. ESG index methodologies: A look inside the “green” box

How do index providers design and construct their ESG indices? What are their underlying methodologies and what do they actually measure? And, crucially, does contemporary ESG investing on the basis of these standard-setting devices have a sustainability impact via capital allocation or does it constitute an ESG gap? These are key questions because while index providers “standardize” ESG investments,¹⁵ ESG indices are not uniform, but their methodologies vastly differ¹⁶ in order to achieve widely diverging objectives: from promoting women’s leadership or excluding weapons manufacturers, to performance-focused investment in ESG Leaders (best-in-class approach) and impact-focused indices that aim to invest into green opportunities or align investments with the Paris Agreement. Due to space constraints, we are not able to analyze all sustainability dimensions but focus only on climate aspects in this section.

But while ESG investing is often equated with “green” finance in regulatory and public discourses, these indices have vastly different climate impacts. As a recent study by InfluenceMap (2021) demonstrated, the average Portfolio Paris Alignment Score—which measures the degree to which a fund portfolio is (mis)aligned with the climate targets set out in the Paris Agreement—is −6% for Broad ESG funds compared to 0% for climate-themed ESG funds, and between −12% and −17% for global benchmark indices such as the MSCI World, S&P 500 and Stoxx Europe 600. While performing better than non-ESG indices, this indicates how Broad ESG funds are not aligned with the Paris Agreement.¹⁷ Similarly, the Aggregate Fossil Fuel Reserves Intensity—how many tons of CO₂ emissions are released through US\$ 1 million of investment—is four times higher for Broad ESG funds than for climate-themed funds (621 vs. 173). The sustainability impact of ESG indices therefore varies significantly.

Rather than one third of global investments being “sustainable” as claimed by financial industry bodies (GSIA, 2020: 5), the question is how many ESG investments actually meet global climate mitigation targets as set out by the Paris Agreement. To address this issue, we created a classification of ESG indices across the three

major ESG index providers, categorizing these indices according to their climate impact. This categorization is based on differences between ESG index investment objectives and the methodologies that underlie the construction of these indices (Table 2). We then exemplarily discuss the index methodology underlying the largest ESG fund in our dataset for each category.

The first level of ESG indices contains *Broad ESG* (or ESG integration) indices. Generally, these indices have a very low sustainability impact since the methodology of these broad ESG indices takes into account a plethora of different indicators. On the individual company level, these indices utilize MSCI's "standard" ESG ratings. However, in this rating methodology, climate change is only 1 out of 10 pillars, and carbon emissions is only 1 of 35 sub-issue areas that together constitute an ESG rating. For companies in the oil industry, for instance, carbon emissions only account for 14% of the overall ESG score (Table 3). Given that CO₂ emissions from oil consumption are one of the world's major drivers of climate change, it becomes clear that these standard ratings are not effectively mitigating climate risks.

On the aggregate index level, the question is which scores/companies are included and how these companies are weighted. Let us take for instance the "MSCI USA Extended ESG Focus Index" that underlies the largest passive ESG fund in our sample, BlackRock's "iShares ESG Aware MSCI USA" fund which has US\$24.7 billion AuM. By aiming at creating "risk and return characteristics similar to those of the MSCI USA Index [the parent index]," its tracking error is minimal 0.5%, only excluding a handful of companies based on ESG criteria (e.g., tobacco, gambling, coal, and oil sands), and consequently, this Broad ESG index hardly deviates from investing into its non-ESG parent index. ExxonMobil, for instance, is its ninth largest constituent, and the

Table 2 Varieties of ESG indices

	MSCI	S&P DJI	FTSE Russell
Broad ESG	For example, Global Environment, Women's Leadership, Impact, ESG Screened ex Fossil Fuel, Faith Based, SRI, KLD400, ESG Leaders, ESG Focus, ESG Universal Index	For example, S&P ESG, ESG Select Equal Weight, Dow Jones Sustainability, DJSI Diversified, S&P Sustainability Screened, other Core ESG indices	For example, FTSE ESG Index Series, Blossom Japan, Green Revenues, Global Climate Index, Women on Boards Leaderships
Light Green	For example, Ex Fossil Fuel, Low Carbon Index	For example, S&P Global 1200 Fossil Fuel Free, Carbon Price Risk 2030 Adjusted Index	For example, Climate Balanced Factor Index, FTSE4Good RAFI, FTSE4Good Global Minimum Variance Index
Dark Green (Paris Aligned)	For example, Climate Change Index, MSCI Climate Paris Aligned Index	For example, Paris-Aligned & Climate Transition (PACT) Index	For example, FTSE Climate Transition Benchmark (CTB), FTSE Paris-aligned Benchmark (PAB) Indices

¹ Source: Data compiled by the authors from company websites.

Table 3 MSCI ESG rating methodology for integrated oil and gas industry

ESG elements	Sub-issues
Environmental (40%)	"Carbon emissions" (13%) "Biodiversity and land use" (10%) "Water stress" (10%) "Toxic emissions & waste" (7%)
Social (27%)	"Health & safety" (10%) "Community relations" (10%) "Labor management" (7%)
Governance (33%)	"Ownership & control," "board," "pay," "accounting," "business ethics," "tax transparency" (aggregate score)

¹ Source: MSCI (2022a).

“iShares ESG Aware MSCI USA” fund alone still invests \$237.1 million into one of the world’s largest carbon emitters.¹⁸ Overall, 2.5% of investment through this index goes into companies such as ExxonMobil, Chevron or ConocoPhillips that hold fossil fuel reserves—compared to 3.6% in the non-ESG parent index and 0% for related but climate-focused indices such as the “MSCI USA Choice ESG Screened” Index (MSCI, 2020). The Broad ESG index invests even slightly more (5.25%) into fossil fuel companies than the non-ESG parent index (5.09%).¹⁹ In addition, companies included into the “MSCI USA Extended ESG Focus” Index do not require a minimum ESG rating (MSCI, 2020). Correspondingly, broad ESG indices are not likely to create sustainability impact via capital allocation (inside-out or output ESG) but are rather about safeguarding investment performance against adverse effects from climate change and state measures to mitigate it (outside-in or input ESG). This is also noted by MSCI itself which states that “MSCI’s ESG ratings are designed for one purpose: to measure a company’s resilience to financially material environmental, societal and governance risks. Our ESG ratings provide a window into one facet of risk to financial performance. They are not a general measure of corporate ‘goodness,’ a barometer on any single issue or a synonym for sustainable investing” (MSCI, 2022b). FTSE Russell similarly notes that its Broad ESG index range is designed for “investing in a world that’s changing” rather than “investing to change the world” (FTSE Russell, 2022). In other words, the capital allocation mechanism is ineffective for most Broad ESG funds.

The second level of ESG indices is what we call *Light Green* indices. These are ESG indices that aim to identify and minimize climate-related financial risks for investors, largely by excluding fossil fuel and other carbon-intensive industries from their portfolios. In contrast to Broad ESG indices where ESG factors are equally weighted, environmental factors are much more important in the construction of these indices.

One example for this is the “MSCI USA Minimum Volatility ESG Reduced Carbon Target” index that underlies the “iShares Edge MSCI USA Minimum Volatility ESG UCITS ETF,” the largest Light Green fund in our sample with (only) US\$1.71 billion AuM. In addition to minimizing volatility risk, this index aims to “reduce the carbon-equivalent exposure to CO₂ and other GHG,” reduce “the exposure to potential emissions risk of fossil fuel reserves by 30%,” and to “improve the weighted-average industry-adjusted ESG score of the Index portfolio by 20% with respect to their [...] parent index” (MSCI, 2022c). Instead of 133t of CO₂ emissions for each US\$1 million of investment (non-ESG parent index), the Reduced Carbon Target index only creates 52t of CO₂ emissions. These indices also deviate substantially from their parent benchmarks, with a tracking error of 7.1% compared to 0.5% for the previously discussed Broad ESG index. Notably, this tracking error is much higher than the average for actively managed funds—another indicator for their greater potential sustainability impact. In addition to Broad ESG indices which frequently exclude tobacco, gambling, and coal, such Light Green indices often also exclude oil companies, albeit they invest into natural gas companies (1.93% of holdings).²⁰ However, while faring better than Broad ESG indices, these Light Green indices commonly remain focused on mitigating risks for investors (input ESG) with less emphasis placed on facilitating impactful investment (output ESG).

The third level of ESG indices is what we call *Dark Green* indices. These indices are geared to facilitate the transition toward a low carbon economy and are therefore designed to exceed the minimum requirements of the EU Climate Transition Benchmark or EU Paris Aligned Benchmark which were an outcome of recent regulatory initiatives to allow for a better classification of ESG funds (see below). Let us take for example MSCI’s “USA ESG Enhanced Focus Climate Transition Benchmark (CTB) Index” which underlies the “iShares MSCI USA ESG Enhanced UCITS ETF” (AuM: US\$5.0 billion), the largest Dark Green ESG fund in our sample. Rather than being based on standard ESG ratings, these indices use MSCI’s low carbon transition scores that explicitly aim to “increase exposure to companies participating in opportunities associated with transition and decrease its exposure to companies exposed to risks associated with transition” (MSCI, 2022d). While Broad ESG and (to a lesser extent) Light Green indices mostly focus on exclusions or shifting the relative weight of companies with severe environmental or ESG controversies (e.g., coal, oil), these indices further aim to: reduce GHG intensity by a minimum of 30% relative to the reference index; incentivize companies to set emissions targets, increasing weighting of companies which see opportunities from climate transition; have at least equivalent ratio of weighted average “green revenues” to weighted average “brown revenues” as that of the underlying investment universe; increase the share of green companies by up to 300% compared to parent index; and facilitate annual decarbonization by reducing the weighted average GHG intensity by 7% on an annualized basis (MSCI, 2022e).

Paris-Aligned Indices follow similar but even stricter methodologies. In addition to coal, “MSCI Climate Paris Aligned” indices exclude other fossil fuel sectors have a 400% share of green companies compared to the parent index, a 50% minimum reduction in weighted average potential emissions intensity, and annual decarbonization of 10% (MSCI, 2022f). While Light Green indices aim to achieve *some* degree of sustainability impact, the overall objective of Dark Green indices is to bring investment practices in line with the +1.5°C target of the Paris Agreement. Rather than value-driven methodologies, such Dark Green indices follow a more value-based approach.

Importantly, the construction of Dark Green indices is also subject to some questionable methodological decisions; while excluding all companies active in coal, oil and gas extraction, the screening process for the above-mentioned “USA ESG Enhanced Focus Climate Transition Benchmark (CTB) Index,” for instance, does not include “fossil fuel service” firms. Consequently, oil field service companies like Schlumberger—the world’s largest offshore drilling contractor—and Halliburton—which is responsible for most of the world’s fracking operations—make up 1.28% of the “iShares MSCI USA ESG Enhanced UCITS ETF.” In other Dark Green indices, however, like the “MSCI World Climate Change Paris-Aligned Select Index” fossil fuel companies only account for a nominal 0.05% of investments.²¹ Overall, the impact-oriented methodology of Dark Green indices most likely outweighs such smaller drawbacks; but it points toward more fundamental problems of index-based ESG investing. What is considered “sustainable” is ultimately defined by a handful of private market actors which act as powerful standard-setters and whose methodologies and decisions do not necessarily align with international climate agreements.

However, of all three ESG index categories, we argue that only funds that replicate/follow Dark Green indices can be considered as (mostly) holding genuinely sustainable assets in their portfolio. Dark Green indices could therefore potentially mitigate the ESG capital allocation gap and create substantial sustainability impact (output ESG).²²

Drawing on our dataset, we categorized the indices that determine the capital allocation of passive ESG funds based on this classification. Out of all passive ESG funds, 57 funds worth US\$167.2 billion follow Broad ESG indices, representing 88.0% of total passive AuM. Light Green indices are only followed by 11 funds worth US\$13.4 billion (7.1% of AuM), while only 3 funds (US\$9.3 billion) follow Dark Green indices—representing a mere 4.9% of passive AuM (Fig. 5).

Importantly, our above analysis of ESG index methodologies has shown that certain ESG indices *could* potentially have a sustainability impact by steering capital allocation toward green activities. However, the distribution of assets within the ESG industry demonstrates that these Dark Green indices only represent a fraction of all ESG investments. Historically, index providers, primarily MSCI, have established that ESG investing also includes the vague category of Broad ESG funds. This standard-setting ability has led to the situation that Broad ESG has become the de facto standard for sustainable investment. Consequently, most ESG funds currently do not have a

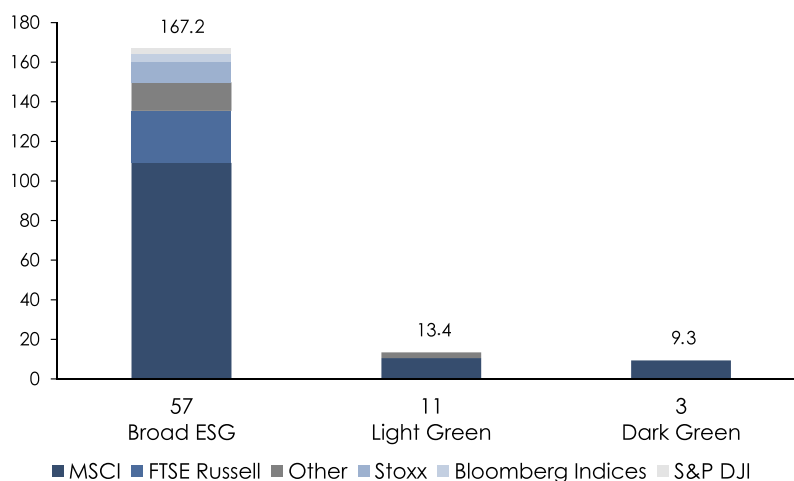


Figure 5 ESG funds and AuM in passive segment by index type (US\$ billion). *Source:* Authors’ calculations based on index provider classifications and Bloomberg Terminal.

meaningful sustainability impact via capital allocation. Instead, we observe the existence of an ESG “capital allocation gap.”

While in the past the ESG industry relied on private governance, regulators in both the US and the EU have launched initiatives to remedy existing shortcomings of ESG. Due to space constraints, we are not able to discuss all regulations in detail, many of which are still being developed, but would like to offer two observations that point toward the fact that current regulation will not necessarily make a significant difference. First, regulation is based on disclosure and not impact. In May 2022, the SEC published proposed rules for mandatory disclosures by ESG funds, distinguishing between “Integration Funds,” “ESG-Focused Funds,” and “Impact Funds” (SEC, 2022). All these funds would need to describe how they incorporate ESG factors in their investment strategy, while ESG impact funds would also need to disclose how they measure progress on their objectives. Similarly, the European Union has enacted the Sustainable Finance Disclosure Regulation (SFDR) primarily aimed at investment funds in 2019 and its disclosure requirements will be phased in from 2021 to 2023 (EU, 2019). SFDR seeks to make the sustainability profile of funds more transparent and thus facilitates their comparison for investors. Under the new SFDR classifications, investment funds must be labeled either as Article 6, 8, or 9 funds, with Article 6 funds having the lowest and Article 9 funds the highest sustainability objectives. While these two sets of categories do not map exactly onto our categorization between Broad ESG, Light Green, and Dark Green funds, they share a lot of parallels. By focusing on transparency and disclosure, these regulations largely follow the governance logic of private industry standards instead of focusing on the sustainability impact of investment, which in turn would be crucial to achieve policymakers’ aims of fighting climate change.

Second, and linked to the previous point, recent regulatory initiatives have largely been “pre-structured” by the private standards set by financial actors. As Bloomberg (2021) noted, “Paris Aligned Benchmarks (PAB) were first introduced in 2019 as tools to accompany the transition to a low carbon economy by the Technical Expert Group of the European Commission.” However, it is important to note that the “Technical Expert group on sustainable finance” mostly consists of financial firms. Out of 33 members, only 4 are from NGOs, the rest from finance and industry associations (see Seabrooke & Stenström, 2022). In addition, the Expert Group’s “low carbon benchmarks” subgroup that proposed Paris-Aligned Benchmarks consists of one small business consultancy and six financial companies (including MSCI).²³ As one interviewee noted, it was “obvious” that public standards “emerged out of” the self-governance phase, given the influence of companies such as MSCI in shaping public regulation in the Commission’s Technical Expert Group.²⁴ While future research needs to examine the interaction between private financial institutions and public regulation, it seems that current regulation does not significantly deviate from the governance of ESG through private standard-setting with respect to capital allocation and is therefore not able to close the capital allocation gap.

5. Conclusion

Arguably, the key open question for ESG investing is whether these rapidly growing funds are used by investors only to manage ESG risks (input ESG) or whether they create a sustainability impact (output ESG). Many observers, including asset owners, policymakers, and the public, seem to *assume* that ESG funds have a significant positive effect on the sustainability of listed companies. However, the actual transmission mechanisms via which sustainability impact can work have so far been inadequately researched. In this paper, we aim to contribute to this ongoing debate by focusing on the crucial role of ESG indices in setting de facto standards for sustainable capital allocation.

In the absence of public regulation, the emergence of private industry standards has characterized the *governance of ESG*. In addition, with respect to the *governance by ESG* there are three transmission mechanisms through which ESG funds might create impact: (1) ratings, (2) shareholder engagement, and (3) capital allocation. These mechanisms either achieve a sustainability impact or constitute a gap if they remain ineffective or unutilized. While existing research has largely focused on ratings and shareholder engagement, our empirical analysis has focused on the capital allocation mechanism, which has so far remained under-researched.

Our findings show that ESG indices are the crucial factor that determines how sustainable the capital allocation of ESG funds is. Passive ESG funds directly replicate indices, while most active ESG funds do not deviate significantly from their benchmark indices either. Through a detailed analysis of the ESG funds industry, we have

found that the market for the provision of ESG indices is highly concentrated with MSCI having an overall market share of 56% (and a remarkable 68% for passive funds). In contrast, the market shares of asset managers in the ESG space are relatively dispersed, especially in active funds where Fidelity leads with only 16%, while the smaller segment of passive ESG funds is dominated by BlackRock with a market share of 45%. Hence, ESG index providers—MSCI in particular—are setting standards for sustainable investing and de facto steer capital allocation within ESG investing. However, the ESG indices they provide have very different sustainability impacts. The majority of ESG funds today fall into the very problematic category of Broad ESG (or ESG integration); these funds stay very close to their non-ESG benchmarks and rarely facilitate sustainability impact. The next category is Light Green funds. While these have some sustainability impact, they are primarily focused on mitigating risks for investors (input ESG). Overall, only Dark Green funds facilitate capital allocation that has a significant sustainability impact (output ESG). However, contemporary ESG investing is heavily skewed toward Broad ESG indices (88% of total AuM), with only three Dark Green funds in the 250 largest ESG funds of our dataset (4.9%). Thus, while ESG indices *could potentially* have a sustainability impact, most currently do not meaningfully facilitate sustainability—we call this the “ESG capital allocation gap.”

Based on the findings of our analysis we have identified a few key points on which researchers, regulators, and policymakers could focus. The sheer urgency of addressing climate change and other sustainability issues suggests that the real-world impact of ESG funds should be pivotal. First, this means that we need much more research on the transmission mechanisms of ESG funds and the different actors that are involved in shaping and influencing their implementation. Second, it seems crucial to develop regulation that is specifically targeted toward the two key transmission mechanisms: shareholder engagement and capital allocation. Initially, ESG funds should publicly disclose how exactly they utilize these two transmission mechanisms. Subsequently, mandatory minimum standards could be developed to ensure asset owners that their investments actually create meaningful impact via these mechanisms. This would also address concerns of greenwashing which is harmful to investors and asset managers alike. This primarily pertains to the very fuzzy category of Broad ESG (or ESG integration) funds, most of which closely track non-ESG indices. Without minimum standards for shareholder engagement, these funds will not be able to create sustainability impact.

Dark Green funds that use both shareholder engagement and capital allocation clearly have the highest potential to create sustainability impact. Hence, researchers, regulators, and policymakers should think about developing effective incentives for retail and institutional clients to invest in such Dark Green funds, be it through regulatory measures or favorable taxation schemes. The rationale is that significant sustainability impact contributes toward reducing “public bads” (climate change, biodiversity loss, etc.) and thereby creates value for the public, which future research should attempt to quantify. While current regulatory efforts to make ESG investing more transparent are important, future regulation should take more effective steps to facilitate the sustainability impact of ESG investing. Only if utilized effectively, ESG investing can potentially create significant impact that helps to mitigate global climate change and other pressing sustainability issues.

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Data availability statement

The data that support the findings of this study are available from Bloomberg. Restrictions apply to the availability of these data, which were used under license for this study. Data are available from <https://www.bloomberg.com/professional/solution/bloomberg-terminal/> with the permission of Bloomberg.

Endnotes

- ¹ We focus our analysis on the climate dimension, thus applying a narrow definition of sustainability; an analysis of other dimensions of sustainability is beyond the scope of this paper.
- ² We conducted these interviews with professionals from asset managers, index providers, and exchanges which work on ESG topics from various perspectives (fund management, research, business, or product development); see list of all interviews in Appendix A.
- ³ An exemplary depiction of the dataset can be accessed in the Supporting Information, Bloomberg's copyright policy does not permit us to share the complete dataset.
- ⁴ Smaller funds are thus beyond the scope of this analysis.
- ⁵ These are all Broad ESG indices (see Section 4).
- ⁶ Another metric for assessing index hugging is the "active share" of a portfolio, with index hugging defined as below 60%, somewhat active 60%–80%, and benchmark-agnostic above 80%. While it is very difficult to assess this measure for all funds, we calculated this for the 20 largest active ESG funds (for which data are available): for these funds, the AuM-weighted average active share is 76.61%.
- ⁷ Interview_1, Interview_8.
- ⁸ Interview_7.
- ⁹ This was also confirmed by Interview_8.
- ¹⁰ This figure matches MSCI reporting data; in its "ESG Investing" Brochure, MSCI (2022g) noted that by Q4-2020 passive funds worth US\$105.1 billion tracked MSCI ESG indices.
- ¹¹ Interview_11.
- ¹² This is in line with Fransen and Conzelmann (2015) who argue that high industry concentration, business-driven governance, and lenient standards lead to more cohesive private regulation.
- ¹³ Interview_2.
- ¹⁴ Interview_3, Interview_4, Interview_5, Interview_8, Interview_9, Interview_11.
- ¹⁵ Interview_8.
- ¹⁶ Interview_2, Interview_4, Interview_7, Interview_8, Interview_10.
- ¹⁷ The Portfolio Paris Alignment Score is based on the Paris Agreement Capital Transition Assessment (PACTA) tool and measures whether fund portfolios are aligned with the Paris Agreement; negative scores indicate that fund portfolios do not meet climate targets; see: <https://influencemap.org/report/Climate-Funds-Are-They-Paris-Aligned-3eb83347267949847084306dae01c7b0>.
- ¹⁸ Fund holdings data (as of 30 December 2022): <https://www.blackrock.com/us/individual/products/286007/ishares-esg-aware-msci-usa-etf>.
- ¹⁹ GICS classification "Energy"; see: <https://www.msci.com/documents/10199/0bd7923e-e2d0-f83a-701b-2f9bfc03eb65>; <https://www.msci.com/documents/10199/67a768a1-71d0-4bd0-8d7e-f7b53e8d0d9f>.
- ²⁰ Fund holdings data (as of 30 December 2022): <https://www.ishares.com/de/privatanleger/de/produkte/313214/ishares-edge-msci-usa-minimum-volatility-esg-ucits-etf>.
- ²¹ See: <https://www.msci.com/documents/10199/1b9e2d47-cef9-3ec7-aa44-b000ad2b2070>.
- ²² However, even Dark Green ESG funds rarely define their shareholder engagement strategy to create sustainability impact.
- ²³ <https://ec.europa.eu/transparency/expert-groups-register/screen/expert-groups/consult?lang=en&do=groupDetail.groupDetail&groupID=3588> (last accessed 2 March 2023).
- ²⁴ Interview_8.

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APPENDIX

INTERVIEW DATA

Interview_1	APAC director, index provider (Hong Kong, 7 June 2017)
Interview_2	Head of business development, index provider (Hong Kong; 27 September 2018)
Interview_3	Former asset manager (New York, 19 August 2019; telephone interview)
Interview_4	Head of research, index provider (Frankfurt; 20 August 2019)
Interview_5	Senior managing director, index provider (Zurich; 23 August 2019; telephone interview)
Interview_6	Research department, index provider (Shanghai, 23 October 2019)
Interview_7	Product development, derivatives exchange (Frankfurt, 28 February 2020)
Interview_8	ESG fund manager (Frankfurt, 2 September 2022)
Interview_9	ESG analyst, asset management company (Munich, 29 September 2022)
Interview_10	ESG analyst, commercial bank (Frankfurt, 9 November 2022)
Interview_11	Managing director, index provider (Hong Kong, 8 December 2023)

Supporting information

Additional Supporting Information may be found in the online version of this article at the publisher’s web-site:

Data S1. Supporting Information.