

Different Shades of ESG Funds

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Abstract

Analyzing US active equity mutual fund prospectuses, we find that only 20% of those using ESG terminology qualify as *impact* funds, tilting their portfolios based on non-pecuniary ESG considerations. The remainder are either *exclusionary* funds, using ESG criteria to restrict their investment universe, or *opportunistic* funds, leveraging ESG data for financial gain. Our findings indicate that only *impact* funds, and those engaging in ESG activism, exhibit higher ESG ratings. In contrast, most *opportunistic* funds display no clear ESG preference and may even short-sell high ESG-rated stocks. Overall, funds tend to adhere to their ESG claims, attenuating concerns about widespread greenwashing.

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ESG encompasses a wide variety of investments and strategies. I think investors should be able to drill down to see what's under the hood of these strategies. This gets to the heart of the SEC's mission to protect investors, allowing them to allocate their capital efficiently and meet their needs.

Gary Gensler, SEC Chair, 2022 ¹

1 Introduction

What does “ESG investing” mean? Despite its rapid rise in popularity, and the great attention it has attracted among academics and practitioners, there still exists widespread disagreement about what ESG investing entails and how to measure it. Both academics and regulators have stressed the need for greater transparency in the ESG disclosures of investment vehicles. The European Union has already passed regulation requiring greater detail in ESG disclosure, while the Security and Exchange Commission (SEC) has recently proposed a rule change to require additional ESG disclosures from US investment vehicles.² From an academic perspective, in the 2022 presidential address of the American Financial Association, Laura Starks stressed the importance of distinguishing between different *objectives* associated with ESG investments, particularly focusing on whether ESG information is utilized to drive more “value” to the investment firm or to abide by non-pecuniary “values” of the end investors (Starks (2023)). Despite the need for greater clarity in ESG definitions, the theoretical and empirical literature have not yet converged to a unified framework, leading to potential confusion and contrasting empirical findings.

In the spirit of Starks (2023), the goal of this paper is to provide a more comprehensive and economically informative classification of ESG funds, by distinguishing between the different *objectives* that funds follow to incorporate ESG considerations into their portfolio allocations. To this end, we first analyze the universe of narrative strategy descriptions in the prospectuses of active equity US mutual funds to identify different types of ESG investment strategies, and we assign them to one of three core categories: (i) *exclusionary*; (ii) *impact*; or (iii) *opportunistic*.³ Then, by studying their relative prevalence and features, we show that only a minority of ESG-related funds disclose having non-pecuniary preferences over ESG characteristics, and only those that do, along with funds engaging in ESG-related activism, display a significant portfolio tilt towards higher ESG-rated firms.

¹[Link to SEC Press Release on new ESG disclosure proposed rule](#)

²[Link to SEC ESG disclosure proposed rule](#)

³Our categorization is in line with the principles of the SEC’s proposed rule. The key distinction being that the categorization proposed by the SEC places greater focus on the *importance* of the ESG component for a fund’s strategy, while we emphasize the *objective* with which ESG information enters a fund’s objective function.

Our ESG categorization summarizes the theoretical definitions of ESG-related investment that have been proposed in the academic literature, with a focus on how ESG information enters a fund’s objective function.⁴ First, *exclusionary* strategies incorporate non-pecuniary preferences by applying negative screens. In a first stage, a subsets of stocks is excluded from the fund’s consideration set based on non-pecuniary preferences; in a second stage, portfolio allocation is optimized based on risk-adjusted returns alone. More formally, these funds maximize risk-adjusted returns, subject to an ESG-related constraint. Second, *impact* strategies directly incorporate non-pecuniary preferences (e.g., the impact that a company might have on climate change, or on social development) in their portfolio allocation decisions, along with considerations about risks and return. More formally, these funds jointly maximise risk-adjusted returns and ESG-related preferences. Third, *opportunistic* strategies are often assimilated with arbitrageurs or investors without ESG-related preferences. Funds implementing these strategies take into account ESG variables that might play a “material” role in defining a company’s future risk-return profile, but do not otherwise have specific preferences over ESG characteristics themselves. More formally, these funds maximize risk-adjusted returns, while using ESG-considerations as part of their information set. Finally, we define as *non-ESG* strategies those associated with funds that maximize risk-adjusted returns, ignoring ESG-related information. Both *impact* and *opportunistic* strategies could be implemented by traditional portfolio choice or could be complemented by ESG-related activism. Indeed, both investor types have ESG-related interests with respect to companies in their portfolios. Hence, they might want to exert influence on companies’ management to see their interests upheld. Conversely, *exclusionary* funds, by definition, do not engage with companies with particular ESG issues, precluding any form of ESG-related activism, whereas *non-ESG* funds ignore ESG-related information, so do not engage with firms on those dimensions.

How should we expect the investment behavior of funds in each of these ESG types to differ? Summarizing predictions from the existing literature (e.g., [Pástor, Stambaugh, and Taylor \(2021\)](#), [Avramov, Lioui, Liu, and Tarelli \(2024\)](#), [Goldstein, Kopytov, Shen, and Xiang \(2022\)](#), [Zerbib \(2022\)](#)), we expect *impact* investors to hold stocks with higher ESG ratings than non-ESG ones and any other type of ESG investor, since it is the only strategy in which ESG considerations directly impact a fund’s objective. It is instead unclear whether we should expect funds implementing a pure *exclusionary* strategy to hold stocks with an overall higher ESG rating. Indeed, as pointed out by [Pedersen, Fitzgibbons, and Pomorski \(2021\)](#), after exclusions, low-ESG assets might be useful hedging instruments for high-ESG assets, helping investors improve their Sharpe ratios. Predictions are also unclear for what regards *opportunistic* strategies. In theories in which only *impact* and *opportunistic* investors are present (e.g., [Pástor, Stambaugh, and Taylor \(2021\)](#), [Avramov, Lioui, Liu, and Tarelli \(2024\)](#), [Goldstein, Kopytov, Shen, and Xiang \(2022\)](#), [Zerbib](#)

⁴Section 1.1 summarizes how our definitions relate to the existing literature.

(2022)), asset prices adjust to induce *opportunistic* investors to be willing to hold firms with lower ESG ratings. When including also *non-ESG* investors (e.g., Pedersen, Fitzgibbons, and Pomorski (2021)), the net effect depends on the relative share of investor types and on the co-variation between ESG ratings and firms' Sharpe ratios. Intuitively, *opportunistic* investors do not disclose having a directional preference over ESG-ratings. Hence, they might buy (or short-sell) high or low ESG-rated firms, depending on their assessment of how ESG opportunities or risks correlate with a firm's risk-return profile. So, we do not expect *opportunistic* funds to necessarily hold stocks with higher or lower ESG ratings, but we do expect to observe greater volatility in the ESG score of their holdings.

Finally, considering the subset of *impact* and *opportunistic* funds who engage in ESG-related activism. We expect them to invest in firms with lower ESG ratings than those selected by traditional *impact* funds. In fact, they might aim at improving the ESG scores of the firms they invest in through their activist actions (e.g., see Berk and van Binsbergen (2024), Broccardo, Hart, and Zingales (2022)). Given their different motives, though, their respective engagement might take different forms. For instance, an *impact activist* fund might encourage a firm to invest in a negative NPV project which would improve its environmental profile, whereas an *opportunistic activist* fund might discourage such investment, instead promoting greater transparency with respect to environmental issues, to mitigate future regulatory risks. It is an empirical question whether these funds would aim at bringing incremental ESG improvements to the firms they invest in, or whether they would hold firms with very low ESG ratings, aiming at radically changing their course.

As advocated in Starks (2023) and illustrated by the above predictions, it is crucial to empirically distinguish among these different types of ESG strategies. Indeed, they might substantially differ in their implementation, their promises to investors, and in the characteristics of the demand they commend. Ignoring these differences and pooling all ESG-related funds in one category, would produce average effects that might obfuscate our understating of capital allocation towards ESG investment vehicles and their potential impact on financial markets and the real economy.

The greater challenge in this literature has been to map these theoretical definitions to precise empirical counterparts. Most empirical studies only distinguish between ESG and non-ESG funds, but do not provide a clear distinction among different types of ESG investors.⁵ One of the key contributions of this paper is to develop a methodology to map active equity mutual funds in the US to a more granular ESG categorization. We focus on the Principal Investment Strategy (PIS) section of fund prospectuses, mandated by the SEC. In that section funds provide a narrative description of their investment mandate and the key ways in which they aim to achieve it. We

⁵See Section 1.1 for a summary of empirical approaches in the literature.

start with a dictionary based approach aimed at filtering all candidate ESG-related strategies. We utilize an extensive, albeit not comprehensive, dictionary of ESG-related terminology. The assumption being that an ESG-related fund would mention at least one of the terms included in the dictionary in their prospectus.⁶ Next, we proceed to read and manually categorize all filtered PIS sections. Each section is assigned to two separate readers, and subsequently to a third in case of initial disagreement. Readers assign to each PIS section all relevant labels from the following list: exclusionary, impact, impact activist, opportunistic, opportunistic activist, and mention only. Where, the first five mirror the above definitions, while “mention only” applies to sections in which ESG terminology is mentioned, but without any explanation as to its usage. Finally, we assign funds to mutually exclusive categories following a pecking order: if funds mention any impact motive they are assigned to the *impact* category (regardless of any other label); next, if funds mention opportunistic motives they are assigned to the *opportunistic* category (regardless of whether they might employ exclusions); then, if funds mention exclusions but no other use of ESG-related information they are assigned to the *exclusionary category*; finally, funds with a “Mention Only” label are assigned to the *mention only* category. Within the *impact* and *opportunistic* categories we further isolate funds who mention engaging in ESG-related activism.

We compare our ESG categorization with other popular methods to identify ESG funds, namely: Morningstar’s identifier, and the presence of sustainability-related terms in a fund’s name. Reassuringly, both of those approaches correlate the most with our *impact* category. We find, though, that many of the funds that we categorize as *impact* or *exclusionary* are missed, while many funds that we categorize as *opportunistic* fall in the sustainable category with either method. That is because those methods focus on the *importance* of the ESG component for a fund’s strategy, while our method emphasizes the *objective* for which it is used.

Our categorization is likely to fair similarly also if compared to the SEC’s proposed new rule. Indeed, the SEC proposes to split ESG funds in two categories, with differential disclosure requirements, based on how important ESG factors are for a fund’s strategy. The SEC’s proposal defines “ESG Integration” those funds for which ESG factors are considered jointly with other factors, and defines as “ESG Focused” those funds for which the ESG component is of primary relevance in asset selection (including those adopting ESG-motivated exclusions or activism). “ESG Integration” funds are likely to correlate most with what we define as *opportunistic* or *mention only* funds, even though some funds that we categorize as *impact* might also fall into this category. In contrast, “ESG Focused” funds would include what we define as *exclusionary* funds, as well as most *impact* funds and all funds adopting ESG-related activism. Hence, it would not distinguish between *impact activist* and *opportunistic activist* funds, and it might include some

⁶Appendix A contains the utilized dictionary.

opportunistic funds that make of their understanding of “material” ESG issues a central piece of their asset allocation strategy.

After merging our classification with a full dataset of mutual fund characteristics, returns, and holdings we are able to provide a detailed assessment of the ESG investment landscape. This is the first key contribution of our study. We find that, in spite of the rapid growth of ESG funds in the last decade, currently managing almost 20% of the assets invested in US active mutual funds (compared to 1.2% in 2015), the fraction of capital managed by *impact* funds has declined significantly, going from about 40% to about 6% of the total AUM managed by ESG funds of all types. The fast increase in ESG funds (both in terms of number of funds and of AUM) is primarily driven by the growth of *opportunistic* and *mention only* funds. Both of those fund categories are more likely to emerge from an existing non-ESG fund starting to utilize ESG information. Instead, *impact* and *exclusionary* funds are most likely to be born as such. This phenomenon is not driven by a few fund families. Indeed, we document that the percentage of families with at least one ESG-related fund grew from 11% to 35% between 2015 and 2022. Finally, we document that most ESG categories experience a greater growth in net flows relative to non-ESG funds for at least some portion of our sample period. Interestingly, *opportunistic* and *mention only* funds only experience greater net flows growth in the first years of our sample, while the net flows of *impact* funds experience a higher growth rate throughout our sample period, being the only category enjoying an overall positive cumulative growth in net flows.

We then turn our attention to funds’ investment behavior. We start by analyzing the ESG ratings of funds’ holdings. In our first analysis, through simple double sorts, we show that while *impact*, *impact activist*, and *opportunistic activist* funds hold about 20% more portfolio weight in high ESG-rated stocks (i.e., those in the highest quintile of ESG ratings) than in low ESG-rated stocks (i.e., those in the lowest quintile), *exclusionary*, *opportunistic* and *mention only funds* hold only 6-8% more portfolio weight in high ESG-rated stocks. This stark difference should be considered relative to non-ESG funds, which hold about 2% more portfolio weight in high ESG-rated stocks than in low ESG-rated stocks.

To assess the statistical significance of these findings and control for potential confounders at the fund level, we proceed to a more rigorous analysis. We start by splitting each fund’s portfolio every month into different subsets: a long portfolio, including all stocks with a positive weight; a short portfolio, including all stocks with a negative weight; an over-weighted portfolio, including all stocks with a greater weight than that in the fund’s benchmark; and an under-weighted portfolio, including all stocks with a smaller weight than in the fund’s benchmark. We then compute a TNA-weighted average of the ESG score of stocks in each of these portfolios. We repeat this procedure for overall ESG scores as well as for each of their components. Since only a small sample of mutual

funds are allowed to short sell, we start by analyzing all other components of funds' portfolios through a rigorous regression analysis and later analyze short-selling as a case study.

The dependent variables in our main regression specification are the portfolio-weighted ESG ratings of funds' long, over-weight, and under-weight portfolios. Our key explanatory variables are indicator variables for each of the fund types previously described. We also include fund-level controls: size, age, style, turnover, expenses; and fixed-effects by Morningstar category cross month. Standard errors are clustered at the fund and month level. Hence, the coefficients on each of the indicator variables, represent the difference in average ESG scores for funds of a given ESG-type, relative to non-ESG funds in their same Morningstar category in a specific month.

We find that the overall ESG-ratings of the long and the over-weight portfolios of *impact* funds are on average 0.66 and 0.69 standard deviations higher than those of non-ESG funds, respectively. That is consistent with those funds having a directional preference towards higher ESG-rated firms and tilting their portfolios accordingly. Results are similar for *impact activist* funds, their long and over-weight portfolio are 0.67 and 0.74 standard deviations higher than those of non-ESG funds, respectively. Interestingly, when adjusting firm ratings for industry averages, results are virtually unchanged for *impact* funds, while the magnitude decreases for *impact activist* funds. That indicates that, within industries, *impact activist* funds choose to hold firms that on average have higher ESG ratings than those chosen by non-ESG funds, but lower than those chosen by *impact* funds. That behavior is consistent with an activist objective, through which these funds aim to improve the ESG performance of firms held. We do not find evidence, though, that *impact activist* funds hold firms with very low ESG ratings in an attempt to completely shift their ESG policies, as some of the literature has suggested.

Focusing on other ESG types, we find that also *exclusionary* funds display a positive tilt towards higher ESG rated firms. The magnitude, though, is significantly smaller than that of funds with an impact objective: the ESG-rating of their long and over-weight portfolios is on average between 0.2 and 0.26 standard deviations higher than those of non-ESG funds. That is consistent with a constrained optimization objective which excludes some low rated firms, while portfolio optimization happens within an investible set with a slightly higher average ESG rating. It is intuitive that the magnitude of their tilts would be lower than that of funds with an impact objective, as asset selection within the investible set is not influenced by the stocks' ESG rating.

In contrast the overall ESG score of the long and over-weighted portfolios of *opportunistic* funds are not statistically different from those of non-ESG funds, while they are only marginally significantly different (both statistically and economically) when considering industry-adjusted ratings. This is consistent with *opportunistic* funds' disclosed strategies, which do not have a directional preference for the ESG ratings of the stocks held. We find, though, that *opportunistic activist*

funds do display a tilt of their long and over-weight portfolios towards higher ESG-rated firms, of similar magnitude to that of *impact activist* funds. This suggests that *opportunistic activist* funds might hold long positions in firms with a relatively high ESG-rating with the objective of obtaining higher risk-adjusted returns by influencing their ESG policies (e.g., mitigating ESG-related risks).

Finally, *mention only* funds display a slightly higher ESG rating of their long and over-weighted portfolio than non-ESG funds, but of similar economic and statistical magnitude of that of *opportunistic* funds. This suggests that *mention only* funds might consider ESG ratings only in an attempt to optimize risk-adjusted returns (but without making this explicit in their disclosures), or might simply engage in greenwashing.

Since our regression analysis only allows to compare differences in the mean of the ESG score distributions across types, we also plot the distribution of scores by type for the three portfolios (long, over-weighted, under-weighted). These distributions illustrate the differences in mean shown in the regression analysis, but also display great variation within type. That highlights the importance of providing an external classification, rather than purely relying on holdings-based measures of ESG scores to classify funds.

Next, we repeat the same regression analysis for each of the components of the overall ESG score; i.e., the environmental (E), social (S), and governance (G) scores, as well as those scores re-scaled by their respective weight in the determining the overall score. Looking at the E, S, and G score components, this analysis reveals that, whereas *impact* funds tend to hold stocks that have an average E, S, and G score higher than those of non-ESG funds, the difference is much more pronounced on the S dimension (0.22, 0.31, and 0.75 standard deviations higher, respectively). Focusing on activist funds, we document that, relative to non-ESG funds, impact activists tend to tilt their (long) portfolios more towards stocks with higher E- and S-ratings, whereas opportunistic activists tend to concentrate more on stocks with higher S-ratings. Weighting each score by its importance, provides an even more polarized set of results. Indeed, perhaps surprisingly, for *impact* funds only S scores seem to be statistically different than those of non-ESG funds, while for *impact activist* and *opportunistic* funds only the E dimension remains statistically different than that of non-ESG funds. This showcases a degree of specialization across ESG-types.

Finally, we provide small sample evidence from the set of funds which short-sells (55 funds, 2% of fund-month observations). Consistent with our general reading of these strategies we find that none of the funds with an activist implementation displays short-selling, while those *opportunistic* funds which short-sell chose to do so for stocks with *higher* ESG ratings than those sold short by non-ESG funds, particularly in the E dimension. That is additional evidence that they do consider ESG ratings in their asset allocation decision but utilize them only for risk-return optimization, without having a directional preference over ESG scores themselves.

In sum, these results highlight the importance of distinguishing among different ESG types. Only funds that disclose having non-pecuniary ESG objectives, or that adopt an activist approach, tilt their portfolios towards higher ESG rated stocks. In contrast, *opportunistic* strategies, which accounts for the majority of ESG funds in this space, do not have a directional preference towards high ESG rated stocks. Our method is able to empirically distinguish among those strategies, as it is currently the only one focusing on the *objective* with which ESG information is utilized in portfolio optimization. That allows us to lever small language differences within classification, which though translate into starkly different asset selection behaviours.

1.1 Related Literature

A first contribution of our study is to nest the existing theoretical definitions of ESG investing into a general framework that considers how ESG information enters a fund’s optimization to select an optimal portfolio allocation. *Exclusionary* strategies have been extensively studied in the context of the sin stocks literature (e.g., [Hong and Kacperczyk \(2009\)](#)), while [Heinkel, Kraus, and Zechner \(2001\)](#) theoretically modeled how the presence of these strategies might impact firms’ incentives to make green investments. [Zerbib \(2022\)](#) also explicitly models exclusionary strategies, assuming exclusions always occur jointly with what we define as an *impact* strategy. Most other theoretical frameworks model ESG strategies through a non-pecuniary preference for ESG-related considerations which leads investors to tilt their portfolios towards higher ESG firms (e.g., [Pástor, Stambaugh, and Taylor \(2021\)](#), [Avramov, Lioui, Liu, and Tarelli \(2024\)](#), [Goldstein, Kopytov, Shen, and Xiang \(2022\)](#)). Their definitions most closely line up with our definition of an *impact* strategy. These frameworks also include investors who maximize risk-adjusted returns without non-pecuniary ESG preferences. These investors are usually aware of ESG-related variables and of the presence of *impact* investors, and optimize their portfolio allocation accordingly. This is what we would define as an *opportunistic* strategy. [Pedersen, Fitzgibbons, and Pomorski \(2021\)](#) provide a more comprehensive categorization. They consider Type-U (ESG-unaware), who optimize risk-adjusted returns while being unaware of how ESG-related considerations would impact that optimizations; these most resemble our definition of *non-ESG* funds. Type-A (ESG-aware), who optimize risk-adjusted returns, while considering how ESG-related variables impact that optimization; these are closest to our *opportunistic* funds. Type-M (ESG-motivated), who, in addition to the considerations of Type-M investors, also have a preference for higher ESG ratings. This type encompasses both what we define as *impact* and *exclusionary* strategies. Finally, various recent papers have discussed differences in the real impact of an approach to sustainable investment which simply excludes low-ESG firms versus one that directly engages with firms to improve their

ESG prospects (e.g., [Berk and van Binsbergen \(2024\)](#), [Broccardo, Hart, and Zingales \(2022\)](#)). This led us to isolate *impact* and *opportunistic* investors who engage in ESG-related activism.

A second important contribution is to provide a detailed empirical counterpart for the above definitions by classifying active equity mutual funds into the above ESG categories based on the full content and meaning of funds' strategy descriptions. Other recent papers have developed various proxies to identify ESG funds and study their behavior. Most of them rely on the presence of ESG-related terminology in the name of the fund ([Cremers, Riley, and Zambrana \(2024\)](#), [Farroukh, Harford, and Shin \(2023\)](#), [van der Beck \(2023\)](#)); utilize Morningstar fund classifications ([Baker, Egan, and Sarkar \(2022\)](#), [Cremers, Riley, and Zambrana \(2024\)](#), [Raghunandan and Rajgopal \(2022\)](#)); build holdings-based proxies ([Farroukh, Harford, and Shin \(2023\)](#), [Lowry, Wang, and Wei \(2024\)](#), [Ghoul and Karoui \(2022\)](#)); or utilize the Principles of Responsible Investing (PRI) signatory status (e.g., [Gibson Brandon, Glossner, Krueger, Matos, and Steffen \(2022\)](#)). All of these approaches do not allow to fully capture the subtle differences among the strategy types we proposed and, in particular, among funds which integrate ESG considerations due to non-pecuniary preference and those that do so as part of their risk-return optimization mandate. A couple notable exception utilize the full text of fund prospectuses: [Andrikogiannopoulou, Krueger, Mitali, and Papakonstantinou \(2022\)](#) use it to distinguish between ESG and non-ESG funds, but do not differentiate among different ESG strategy types; [Frankel, Martin, Wang, and Yu \(2024\)](#) use it to identify ESG-integration funds and ESG-focused funds that align with the SEC's proposed disclosure mandate, which focuses on the *importance* of ESG information for a funds's strategy, rather than the underlying *objective* as ours does.

Through this novel classification we can provide new evidence on ESG funds' behavior, and in particular on whether it aligns with their promises to investors. The existing empirical literature is mixed on this point. For instance, [Pastor, Stambaugh, and Taylor \(2024\)](#), [Lowry, Wang, and Wei \(2024\)](#) and [Raghunandan and Rajgopal \(2022\)](#) find that ESG funds present higher ESG scores of their holdings. While, [Gibson Brandon, Glossner, Krueger, Matos, and Steffen \(2022\)](#), [Farroukh, Harford, and Shin \(2023\)](#) and [Andrikogiannopoulou, Krueger, Mitali, and Papakonstantinou \(2022\)](#) find that ESG-funds in the US do not hold higher ESG score companies. As previously highlighted, each of these papers uses a different methodology to identify ESG funds. A key feature in common is that they do not distinguish among different ESG types. It is likely that these different methodologies lead to the inclusion of more/less funds of a given type and hence, result in different average behaviors. With our more granular classification, instead, we are able to show that all *impact* funds as well as *opportunistic activist* ones buy/over-weight stocks with significantly higher ESG scores, while other ESG fund types generally do not.

Under the assumption that funds with different objectives cater to investors with matching preferences, our categorization method allows to more directly speak to how the asset management industry translates investor preferences, potentially with non-pecuniary motives, into investments. Hence, we provide a more direct link between existing theoretical frameworks on ESG preferences and the empirical evidence (e.g., [Heinkel, Kraus, and Zechner \(2001\)](#), [Pástor, Stambaugh, and Taylor \(2021\)](#), [Pedersen, Fitzgibbons, and Pomorski \(2021\)](#), [Zerbib \(2022\)](#), [Goldstein, Kopytov, Shen, and Xiang \(2022\)](#)). Indeed, when testing such theories empirically, estimations should focus on investors with non-pecuniary preferences; i.e., *impact* and *exclusionary*. Additionally, equilibrium allocations and the potential real impact of non-pecuniary preferences often rely on the relative mass of *impact* investors. In this paper we document that, at least in the active equity mutual fund space, that mass seems to be smaller than what prior quantifications have estimated.

Our analysis also provide insights as to how these strategies are implemented, by isolating the *impact* and *opportunistic* funds who mention engaging in ESG-based activism. Both [Broccardo, Hart, and Zingales \(2022\)](#) and [Berk and van Binsbergen \(2024\)](#) speak to the necessity of expressing ESG-related preferences by investing in browner firms and exercising rights of control to steer them towards better ESG practices, rather than divesting. Indeed, we document an increase in ESG-*activist* investors. This is also in line with [Krueger, Sautner, and Starks \(2020\)](#) which provides survey evidence suggesting that ESG-oriented investors are more engaged with the underlying companies. Perhaps surprisingly, though, we find that the increase in ESG activism is concentrated within *opportunistic* funds.

2 Classification of ESG Funds

2.1 ESG Strategies

ESG funds can be classified based on how ESG-related considerations enter their investment strategies. In particular, we distinguish among three groups of strategies that make economically distinct use of ESG information and criteria in their objective function. The below strategies need not be considered as mutually exclusive.

Exclusionary. We define as *exclusionary* those strategies in which a fund maximizes an objective only driven by financial considerations, but where the set of investible securities is constrained using ESG criteria:

$$\max E [f(R) \mid \mathcal{R}_{ESG}] \quad \text{s.t.} \quad \text{ESG-constraints} \quad (1)$$

We expect this strategy to attract investors that would like to avoid providing capital to specific types of firms with low ESG values (e.g., sin stocks, or stocks with particularly low ESG ratings). An ESG-exclusionary portfolio strategy limits the exposure to some of the low-ESG firms, but does not necessarily increase the exposure to the high-ESG firms. Once the investible set is decided, only financial performance matters. This strategy is sometimes referred to as “divestment.”

Impact. We define as *impact* those investment strategies in which a fund maximizes an objective driven by both financial and ESG considerations (e.g., returns and ESG-ratings), taking into account information about both dimensions:

$$\max E [g(R, ESG) \mid f_{R,ESGg}] \quad (2)$$

We expect this strategy to attract investors with a greater non-pecuniary preference towards ESG issues. A portfolio following this strategy should be more heavily tilted towards firms that rank highly in their ESG potential, independently from whether that correlates with firms’ fundamentals. Therefore, this investment style has the greatest potential to create an impact for firms’ cost of capital and their ability to fund projects with greater ESG potential, even with low/negative NPV. This strategy is sometimes also referred to as “Sustainable”.

Opportunistic. We define as *opportunistic* those strategies in which a fund maximizes an objective only driven by financial considerations, but using ESG-related information to improve its financial performance (e.g., using ESG metrics that predict future risks or cash-flows of the firm):

$$\max E [f(R) \mid f_{R,ESGg}] \quad (3)$$

We expect this strategy to attract investors that care about financial performance. An ESG-opportunistic portfolio strategy might include investments in both high- and low-ESG firms, depending on market opportunities. Therefore, one should not expect an exposure to firms with above average ESG scores, but rather a greater than average variance in the ESG score of the fund portfolio. This strategy is sometimes also referred to as “ESG-integration”.

In all three strategies, ESG-considerations influence optimal portfolio allocation. The key distinction between the former (*exclusionary*) and the others (*impact* and *opportunistic*), is that in the former ESG-considerations can only enter a fund’s objective function in setting the weight of a subset of stocks to exactly zero. In the others, ESG-consideration may determine any positive or negative deviation in optimal weights. It is worth explicitly making this distinction as it implies that only *impact* and *opportunistic* strategies could be implemented through ESG-related activism.

2.2 Data

We focus on active equity domestic mutual funds, as this is the subset of investment vehicles for which the trade off between return- and ESG-related considerations should be most pronounced. In this sample, we expect to observe all three types of ESG strategies, as described in Section 2. We construct a comprehensive dataset of mutual fund characteristics, returns and holdings, complemented by stock-level ESG ratings. We then utilize mutual fund prospectuses to distinguish between non-ESG and the previously described types of ESG strategies. Our analysis covers the time period from March 2015 to March 2022. The remainder of this section describes dataset construction in detail.

Fund characteristics and returns. We utilize the CRSP Survivorship-Bias-Free Mutual Fund dataset to identify the sample of interest and extract information about fund characteristics and returns. We start by restricting the sample to equity funds and exclude international funds, sector funds, index funds, and underlying variable annuities. We exclude observations dated before each fund’s first offer date to account for incubation bias (Evans (2010)). We then exclude funds with less than \$5 million in Total Net Assets (TNA) (Kacperczyk, Sialm, and Zheng (2008)), and funds for which we have less than 12 months of observations. Next, for each time period, we aggregate observations across all share classes of each fund. This is done by keeping the first offer date of the oldest share class, summing the TNA of all share classes, and averaging all other variables (fees, returns, turnover, etc), weighted by lagged TNA.⁷ Finally, we follow the data appendix of Pástor, Stambaugh, and Taylor (2015) to map our sample to the Morningstar Mutual Fund dataset. From Morningstar we utilize each fund’s Morningstar category, star rating, and sustainability ratings.

Fund holdings. We utilize CRSP Mutual Fund Holdings dataset, which we map to the characteristics and returns dataset using our comprehensive identifier mapped to crsp portfolio numbers (crsp_portno). Based on holdings we apply a few final filters to our dataset: we drop funds that hold fewer than 10 stocks, and funds that hold, on average, less than 80% of their assets (excluding cash) in common stock (Kacperczyk, Sialm, and Zheng (2008)). When observations are missing or only available quarterly, we forward-fill them to a monthly frequency.

Fund prospectuses. We downloaded the Mutual Fund Prospectus Risk/Return Summary Data Set from the SEC’s EDGAR platform. We matched the Principal Investment Strategy (PIS)

⁷We utilize the CRSP Class Group identifier (crsp_cl_grp), the WFICN identifier in MFLinks, and fund names to construct a comprehensive identifier that maps each fund to its share classes. We opt for this approach to ensure a broader coverage. Notably, MFLinks’ mapping excludes many new funds in recent years (Shive and Yun (2013); Zhu (2020)), which might hinder our coverage of ESG-related investment vehicles

section of each prospectus to the CRSP Mutual Fund dataset using the provided link between SEC’s CIK identifiers and fund identifiers. Since any material change to the management of the fund must be reported to both the SEC and fund investors, for any month in which a PIS section is not available, we fill it using the latest available one.

ESG Ratings. We acquired MSCI, Sustainalytics and Refinitiv stock-level ESG ratings, which we match to fund holdings using CUSIP identifiers. MSCI ratings have the greatest coverage for our time-frame of interest. Hence, we utilize them for our baseline analysis. We use ratings from the other providers, and a combined rating across providers in robustness tests in the Appendix.

Other. We also use the CRSP monthly security database, and Fama–French factors.

2.3 Classification Methodology

As required by the SEC, in the PIS section of prospectuses, funds describe their main investing methodology, including the types of securities they tend to hold and the primary criteria used in selecting those securities. If funds incorporate ESG-considerations in asset selection, this is where they should disclose that information. The narrative nature of these disclosures allows to infer the main objective with which ESG considerations enter a fund’s strategy, allowing us to map each fund to a specific ESG-type.

In order to categorize funds as non-ESG or into one of the ESG-types described in Section 2, we start by sub-setting the universe of unique matched prospectuses into “definite non-ESG funds”—i.e., funds that do not disclose using ESG information in any capacity—and “candidate ESG funds”—i.e., funds that might implement any combination of the strategies defined in Section 2. To this end, we start by selecting all prospectuses which mention ESG-related terminology utilizing a dictionary-based approach. The adopted dictionary (reported in Appendix A) is extensive, it includes generic ESG-related terminology—e.g., “social responsibility”, “environmental”, ...; ESG-related acronyms—e.g., “ESG”, “SRI”, “SDG”, ...; as well as a long list of potential ESG-related issues—e.g., “climate change”, “pollution”, “child labor”, “firearm”, The dictionary is by no-means comprehensive of all potential ESG terminology, nor it implies that inclusion of any of this terms in a PIS description automatically places the fund into an ESG-related strategy. The sole objective of this initial filtering is separating non-ESG funds from candidate funds which might implement any ESG-related strategy. Hence, the underlying assumption is that funds that implement an ESG-related strategy mention at least one of the terms included in our dictionary.

Next, based on the strategy descriptions in Section 2, we compile a precise definition of each strategy (as reported below) and we proceed to manually read each of the filtered prospectuses in order to assign it to one of the ESG categories of interest. To that objective, we split the universe of unique matched PIS sections into 6 random buckets, each bucket is assigned to 2 separate readers (3 readers in total, the co-authors of this paper). When readers agree on a categorization, that category is automatically assigned to the section, in case of disagreement, the same section is assigned to a third reader.

The advantage of using a manual approach is that we can more precisely control the subtle split of funds into strategies based not only on the type of information being utilized but also on the underlying intention for which it is being considered. Another advantage of having produced such an extensive sample of manually labeled text, is that we could now train large language models (LLMs) to comprehend the distinction among these strategies, which we could then apply to other ESG-related disclosures.⁸ We report below the exact definition of categories used to guide the manual classification.

- *Exclusionary*: It excludes certain firms or firm categories from its consideration set based on ESG criteria/preferences (weight of zero).
- *Impact*: It utilizes ESG criteria/preferences in choosing portfolio allocations (weights different from zero). Among Impact funds, we isolate the ones which disclose doing activism based on ESG consideration (*Impact Activist*).
- *Opportunistic*: ESG criteria influence portfolio allocations. It must be explicitly stated that those criteria are considered because they correlate with risks, returns, opportunities, hedging or other motives other than a sustainability preferences (weights different from zero). Among Opportunistic funds, we isolate the ones which disclose doing activism based on ESG consideration (*Opportunistic Activist*).
- *Mention Only*: ESG is only briefly and tangentially mentioned without any additional explanations.

In our classification we do not require categories to be mutually exclusive. For instance, a fund might mention considering ESG issues in determining portfolio allocation with a clear impact objective, but might also disclose excluding certain categories altogether. In that case, the reader would select both the *Exclusionary* and the *Impact* labels. Similarly, a fund clearly fitting the

⁸Utilizing a LLM for this task without a pre-labeled sample leads to highly inaccurate outcomes. Given the number of filtered PIS sections, and the number of categories of interest (6), the required sample of manually labeled sections approaches the full sample size.

Impact label, might mention also considering how those same ESG factor might impact future risks or returns. In that case the reader would select both the *Impact* and the *Opportunistic* labels. The only category which is mutually exclusive is *Mention Only* as, by definition, it requires the text to just mention ESG-related terminology without any further explanation.

Ex-post, we implement a pecking order to assign PIS sections (i.e., fund-months) to mutually exclusive categories. If a section is assigned an *Impact* label, we assign it to the *Impact* category (Imp), independently of whether it might have received any other label (65% of sections labeled as *Impact* also mention exclusions, whereas only 24% of them also mention any opportunistic motive). After removing *Imp* funds, if a section received an *Opportunistic* label, we assign it to the *Opportunistic* category (Opp), independently of whether it might also disclose implementing exclusions (only 17% of *Opportunistic* sections do). After removing *Imp* and *Opp* sections, if a section received an *Exclusionary* label we assign it to the *Exclusionary* category (Exc). Finally, if a section received a *Mention Only* label, we assign it to the *Mention Only* category (Men). Within the *Impact* and *Opportunistic* categories we further isolate sections which mention doing activism on ESG-related issues and place them into the *Impact Activist* (Imp Act) and *Opportunistic Activist* (Opp Act) categories respectively.

Appendix B reports examples of PIS sections assigned to each of the six ESG-categories (*Imp*, *Imp Act*, *Opp*, *Opp Act*, *Exc*, *Men*). It is important to note that our fund categorization is only able to capture how funds present these different strategies to investors, it does not speak to whether funds deliver on their ESG promises. That remains an empirical question which we tackle in the next section.

As a validation of our method, and to highlight its benefits, we compare it to other popular methodologies utilized in the academic literature. One popular method to identify sustainable funds is to search for the mention of sustainability-related terms in the fund name (e.g., [Cremers, Riley, and Zambrana \(2024\)](#), [Farroukh, Harford, and Shin \(2023\)](#), [van der Beck \(2023\)](#)). The rationale behind this method is that if funds brand themselves with ESG-related terminology, this must be an important component of their strategy. Another popular method is to utilize Morningstar categorizations. Morningstar provides various ESG-related variables, most of which are populated starting from 2020. One such variable utilized in the literature (e.g., [Baker, Egan, and Sarkar \(2022\)](#)), is "*Sustainable Investment Overall*". This identifies funds for which the "*use of one or more approaches to sustainable investing is central to the investment products overall investment process, based on its prospectus or other regulatory filings*" [Morningstar \(2022\)](#).

Figure 1 provides a comparison of those methods to ours. For each ESG-type (as classified using our methodology) we display the percentage of fund-month observations that are classified as sustainable using Morningstar (*Mstar_ESG*) or the fund's name (*Name_ESG*). The displayed

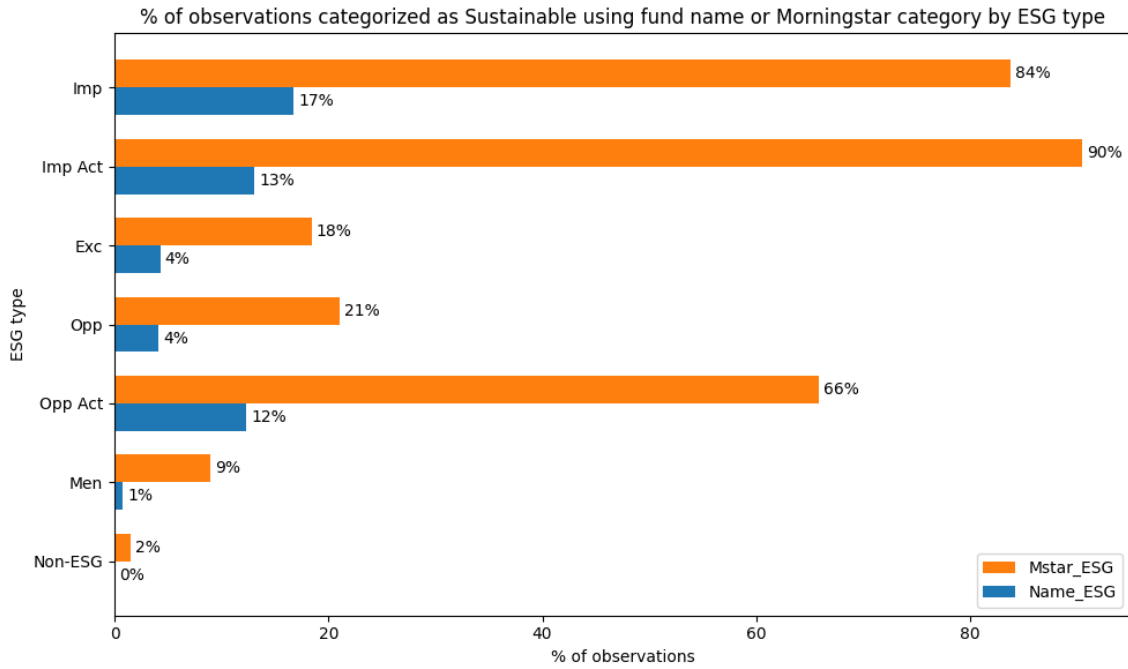


Figure 1: Classification Comparisons

In this figure, we plot the percentage of observations of each ESG type that would be classified as Sustainable based on Morningstar Sustainability categorization (Sustainable Investment Overall), or based on the presence of sustainability-related terms in the fund name (see Appendix A for a full list of terms).

percentages are for the period 2015–2022 for *Name_ESG* and for 2020–2022 for *Mstar_ESG*. Reassuringly, observations in the *impact* and *impact activist* categories are the most likely to be categorized as sustainable with either alternative methodology. Similarly, observations that we deem as *non-ESG* have a very low likelihood of being classified as sustainable with either alternative method. Two other considerations, though, become immediately evident. First, funds that in our methodology pursue uniquely a return-based objective (*opportunistic* and *opportunistic activist*) are also likely to be categorized as sustainable with either alternative method. For instance, 21% of *opportunistic* funds and 66% of *opportunistic activist* funds are categorized as sustainable utilizing Morningstar methodology. That is because our method is able to capture differences in the *objectives* pursued by funds, rather than solely focusing on the *importance* of the ESG component for a fund’s strategy. Second, many ESG funds are missed when considering the fund-name or Morningstar methods. That is particularly true when using fund names to identify sustainable funds, but it is also relevant when utilizing Morningstar variables, given their shorter history.

To summarize the key differences between these two alternative methods and ours, Table 1 displays Type 1 (false positives) and Type 2 (false negatives) errors for the two alternative method-

ologies. Errors are computed relative to our method, when considering as correctly categorized as sustainable any fund that our method categorizes as *impact* or *impact activist* (Panel A) or as *impact*, *impact activist* or *exclusionary* (Panel B). As previously outlined, the name approach has a higher false negatives rate (84-90%), whereas the false positives rate is more moderate (33% when considering *exclusionary* funds as sustainable, 47% otherwise). With the Morningstar methodology, instead, the false positives rate is 41-48%, whereas the false negatives rate is 19-49% (higher when considering *exclusionary* funds as sustainable).⁹

2.4 Trends in ESG Active Investing

After merging our novel classification with the mutual fund dataset described above, we are able to document key trends in the allocation of capital to ESG mutual funds.

Panel (a) of Figure 2 shows the tremendous increase in the number of ESG funds, as well as in the capital that they manage, over the time period 2015-2022. ESG funds represented about 4% of the total number of active equity mutual funds in 2015, managing less than 2% of the capital invested in this industry. After only 7 years, ESG fund grew by a factor of 5, representing 22% of active equity mutual funds, and managing almost 20% of the invested capital. Panel (b) of Figure 2 shows that this trend is not isolated to a few fund families. Indeed, the number of fund families having at least one ESG fund went from 11% in 2015 to 35% in 2022.

Given the different ways ESG funds incorporate ESG information in their asset allocations, Figure 3 illustrates the contribution of the six categories of ESG funds defined in Section 2 to the growth of ESG active investing. While the common perception is that this growth mostly comes from funds that aim to allocate their capital (at least in part) to promote sustainable business practices, i.e., *impact* funds, we uncover that it is the number of *opportunistic* funds, and their assets under management, that have exponentially increased in the last decade. Panel (a) of Figure 3 plots the number of ESG funds in each category over the time period 2015-2022. The light-green shaded area shows that the number of *impact* funds has increased from 20 to 41 in our sample, whereas the number of *opportunistic* funds, captured by the light-red shaded area, increased from just 1 to more than 142. Looking at *impact activist* and *opportunistic activist* funds (dark green and dark red shaded areas, respectively), we observe that impact activism has remained relatively stable, going from 5 to 7 funds during our sample period, whereas opportunistic activism has experienced a faster growth, particularly in the last year of our sample, going from only 1 fund to 38. That implies that overall funds with impact motives (*impact*, and *impact activist*) went from representing about 40% of our sample in 2015 to only about 14% in 2022. Conversely, funds

⁹Recall that Morningstar statistics are based on the time period 2020-2022. The False Negatives rate will be mechanically higher if considering the full period 2015-2022.

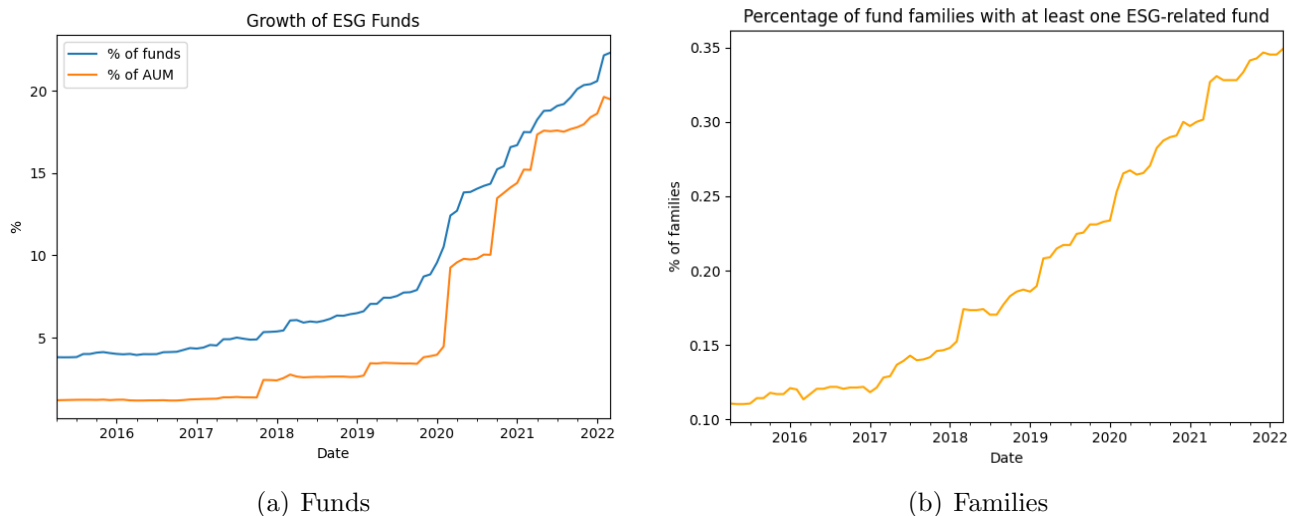


Figure 2: ESG Growth

In this figure, we plot the time-series evolution of: the percentage of ESG strategies among active equity US mutual funds, in terms of both number of funds and assets under management (Panel (a)), and the percentage of fund families having at least one ESG fund (Panel (b)).

with opportunistic motives (*opportunistic* and *opportunistic activist*) went from representing only about 3% of the sample to representing about 52%. When measuring the importance of these categories in terms of assets under management (Panel (b) of Figure 3) their differential growth is even more drastic: funds with opportunistic motives went from managing less than 1% of the AUM of active ESG funds to over 68%, while funds with impact motives went from managing about 40% of AUM to only about 6%.

Figure 3 also reveals that the number of *exclusionary* funds has remained stable between 2015 and 2022, both in terms of number of funds and of capital managed. Given the fast growth of other categories, though, a flat trend implies that while in 2015 *exclusionary* funds represented roughly 50% of active ESG funds (56% of AUM), they only accounted for about 11% of funds (2% of AUM) by 2022.

Mention only funds experienced the second largest growth in the sample, both in terms of number of funds and in AUM. Hence, whereas *mention only* funds represented only about 6% of funds (3% of AUM) in 2015, they represent about 24% of funds (24% of AUM) by March 2022.

In light of the rapid growth in ESG-related strategies, it is worth asking whether the increase in funds classified as a given type comes predominantly from newly created funds, or whether it is driven by existing funds changing their prospectus' strategy description. The heat-map in Figure 4 displays the percentage of funds categorized as each ESG type (i.e., non-ESG, Exc, Imp,

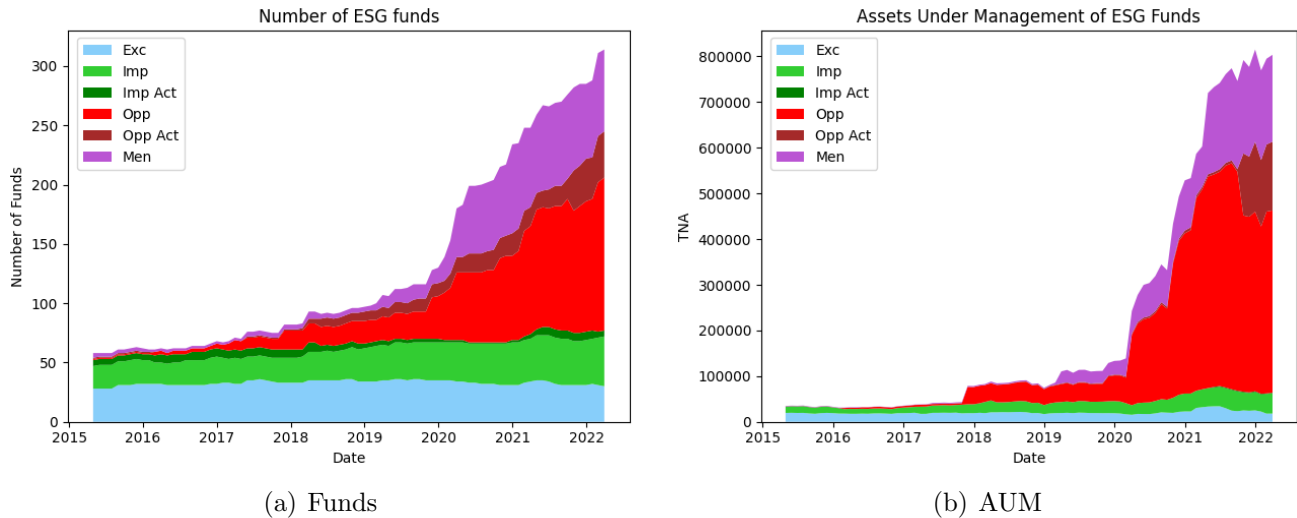


Figure 3: ESG Funds Over Time

In this figure, we plot the time-series evolution of ESG strategy types among active equity US mutual funds. For each of the six ESG categories defined in Section 2, we consider both the number of funds (Panel (a)) and the Total Net Assets (TNA) expressed in \$1000s (Panel (b)).

Opp, Men), broken down by their ESG type when they first appear in our dataset. Diagonal entries indicate the percentage of funds of a given type that were classified as such when they first appear in our dataset, while each row sums to 100%. The first diagonal entry indicates that all non-ESG funds were classified as such when they first appear in our data – i.e., we do not observe funds born as ESG, switching to a non-ESG status. The other diagonal entries show that there is a stark distinction between the source of growth in *exclusionary* or *impact* funds and that in *mention only* or *opportunistic* ones. Indeed, 78% (60%) of funds classified as *exclusionary* (*impact*) are also classified as *exclusionary* (*impact*) when they first appear in our data. In contrast, only 12% (10%) of funds classified as *mention only* (*opportunistic*) are also classified such when they first appear in our data. Looking at the first column of the heat-map, we note that the majority of *mention only* and *opportunistic* funds were categorized as non-ESG when they first appear in our data (88% and 81% of them, respectively); whereas we observe a much smaller percentage of *exclusionary* or *impact* funds switching from a non-ESG status (16% and 29%, respectively). Other entries indicate that only a small percentage of funds initially categorized as one ESG type is later categorized as another.

These findings are consistent with the notion that *opportunistic* funds are not changing their existing profit-maximizing objective; they are simply integrating additional dimensions (E, S, and G) which have become more relevant in driving risks and returns during our time-frame (2015-2022). Notably, this is consistent with what they disclose to investors. They do not claim

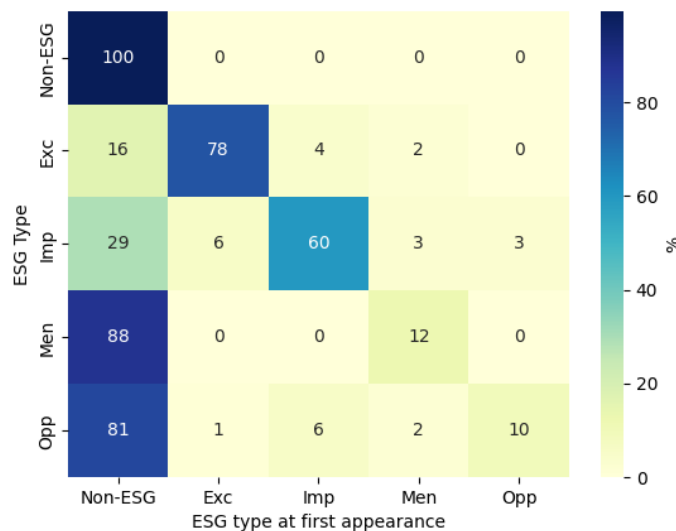


Figure 4: New vs. Existing Funds

The heat-map in this figure indicates the percentage of funds categorized as each ESG type (non-ESG, Exc, Imp, Opp, Men) broken down by their ESG type when they first appear in our dataset. Rows include funds categorized as a given ESG type at any point in their history. Columns indicate funds' ESG type when they first appear in our data.

to be *impact* funds, but end up behaving differently (i.e., engaging in what has been termed as “greenwashing”). They explicitly disclose their intent to use ESG information as a way to improve their financial performance. Regarding *mention only* funds, it is unclear whether they would effectively incorporate ESG considerations in their portfolio allocation, and if so how. Our findings, though, makes it more likely that they would behave either as *opportunistic* funds, integrating material ESG considerations into their investment process, or as *non-ESG* funds, thus engaging in greenwashing in the hope of attracting more capital.

Another interesting question to examine is whether the growth in ESG funds is predominantly driven by a few fund families or whether it is a more widespread phenomenon. Panel (b) of Figure 2 already reveals that there has been a steady increase in the number of fund families with at least one ESG-related fund. Figure 5 further breaks down that trend by ESG-type. Each panel of Figure 5 displays the average percentage of funds per family belonging to a given ESG type (with 1 standard deviation bounds). Those percentages are computed both unconditionally (i.e., if zero funds of a category are present in a family-month, that category is represented with a 0% share—solid lines, primary y-axis); and conditionally (i.e., percentages are computed only among categories present in a given family-month—dotted lines, secondary y-axis). We can draw several insights from this representation. First, it is not common for families to specialize in a single

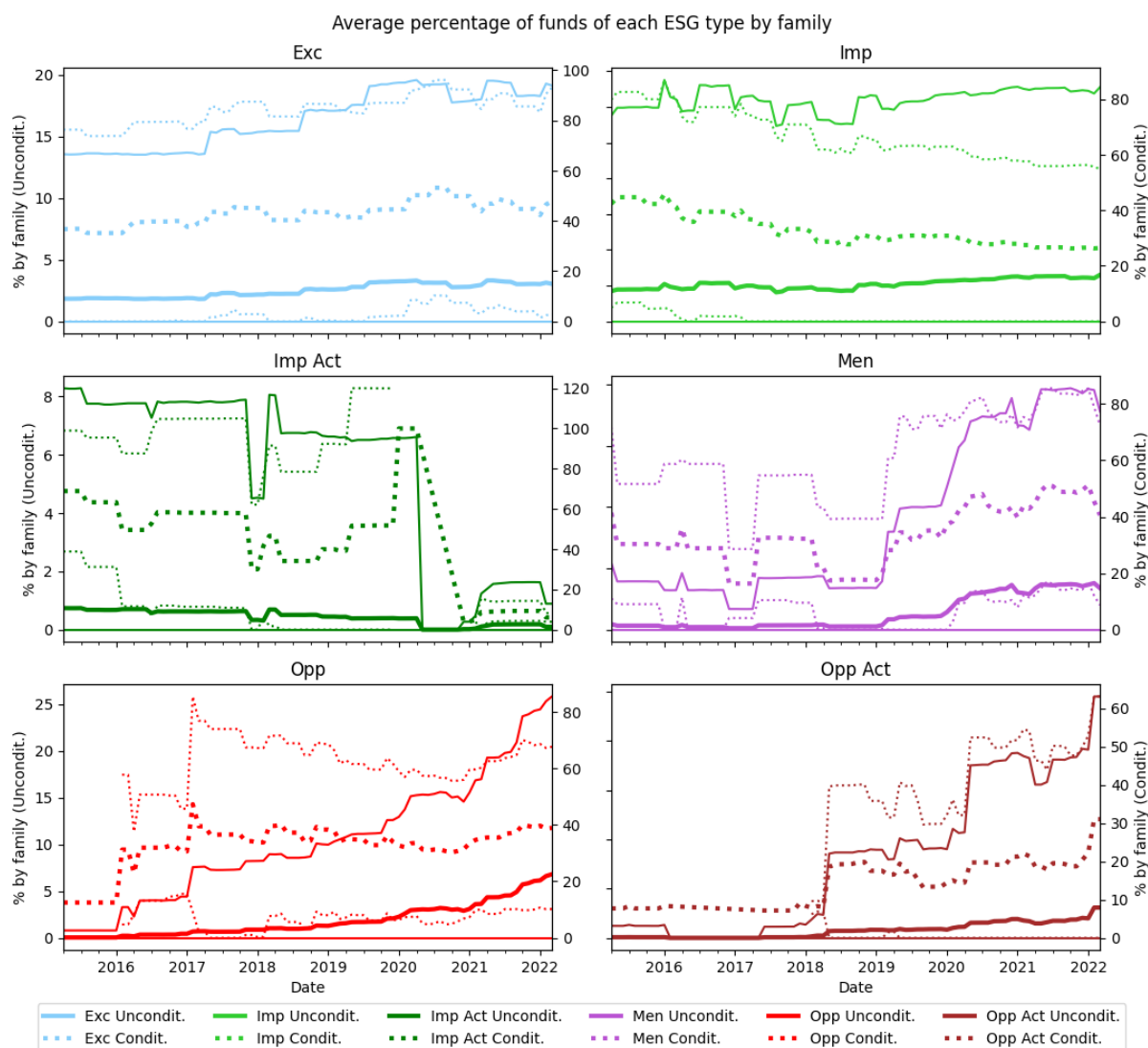


Figure 5: ESG Funds within Fund Families

Each panel in this figure displays the average percentage of funds per family belonging to a given ESG type (with 1 standard deviation bounds). Percentages are computed both unconditionally (i.e., if zero funds of a category are present in a family-month, that category is accounted for with a 0% share—solid lines, primary y-axis); and conditionally (i.e., percentages are computed only among categories present in a given family-month—dotted lines, secondary y-axis).

ESG-type but they likely specialize in only a few. For instance, conditionally on at least one fund of that type being present, on average by the end of our sample 48% of funds per family are *exclusionary*, 41% are *mention only*, 39% are *opportunistic*, 31% are *opportunistic activist*, 26% are *impact*, and 6% are *impact activist*.¹⁰ Unconditionally, those percentages are much lower (between 1% and 7%) indicating that many families do not have funds of any ESG-type. Consistently with

¹⁰Few *impact activist* funds are present hence, percentages might be driven by very few families.

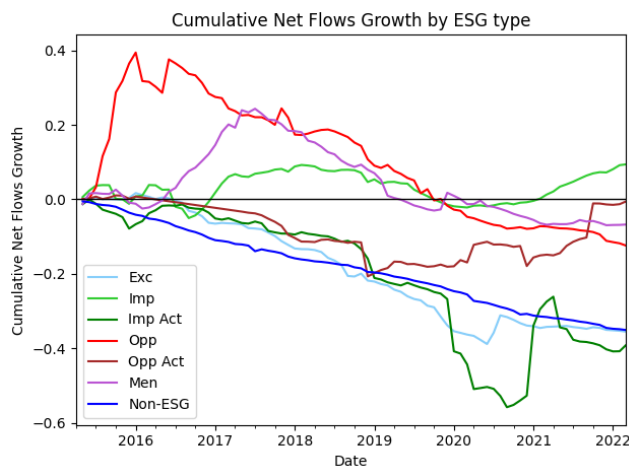


Figure 6: Capital Flows to ESG Funds

In this figure, we plot the cumulative percentage change in asset under management (AUM) due solely to net flows, by ESG type. The measure is constructed by first computing the cumulative net flows going to each category starting from the first month of our analysis; next we compute the growth in cumulative net flows on a month to month basis; finally we compute the cumulative percentage change in AUM due to net flows by compounding those monthly growth rates.

Figure 2 unconditional averages have been increasing over time, particularly for the *opportunistic* and *opportunistic activist* categories.

Finally, we analyze the contribution of flows in determining the growth in ESG investment. With that objective, Figure 6 displays the cumulative percentage change in assets under management (AUM) by ESG type due solely to net flows. This measure should be interpreted as the cumulative percentage change in AUM for each ESG type that would have been achieved absent returns. For comparison purposes, the dark blue line shows a steady decrease in the cumulative growth in AUM due to flows for non-ESG funds, likely due to a general trend towards passive investment. *Exclusionary* and *impact activist* funds experience a similar trend as non-ESG funds. *Opportunistic* and *mention only funds*, instead, experience an increase in size due to net flows in the first years of our analysis (2015-2017), after which they experience a similar rate of decrease in size due to net flows as non-ESG funds. *Opportunistic activist* funds, instead, initially experience a similar trend as non-ESG funds, while starting in 2019 they experience a steady increase in size due to net flows. Finally, *Impact* funds are the only category to experience an increase in size due to net flows for almost the entirety of our sample period, ending up with a net positive growth. This plot suggests that the majority of ESG types enjoys greater net flows than non-ESG funds, for at least some portion of our sample period.

3 Investment Behavior of ESG Funds

In this section, we investigate the portfolio holdings of ESG funds belonging to different categories. Specifically, we study how their fund holdings are related to the ESG ratings of the underlying assets.

Table 2 presents the conditional distribution of portfolio holdings. In Panel A we consider the average percentage of stocks held in one of the five quintiles of ESG-ratings, computed at the stock level in each month. As a reference group we include the category of non-ESG funds. While non-ESG funds on average hold about the same fraction of stocks in each of the five quintiles of ESG-ratings (with only a spread of 2% between the top and the bottom quintiles), ESG funds hold on average a larger fraction of stocks in the top quintile. A similar pattern emerges when considering the cumulative portfolio weights in each quintile, as reported in Panel B. This evidence confirms that ESG funds tend to tilt their portfolio towards high-ESG stocks.

The importance of distinguishing among different ESG strategies is supported by the substantial heterogeneity that characterizes the distribution of portfolio holdings of different categories of ESG funds. For instance, while on average *impact* funds hold 31.5% of portfolio weight in top-ESG stocks (i.e, stocks that belongs to the top quintile of ESG-ratings) and 9.5% in bottom-ESG stocks, *opportunistic* funds hold 22.75% and 15% in top- and bottom-ESG stocks, respectively. This finding is consistent with the idea that funds which incorporate ESG information to maximize only a financial objective tend to be more selective and may tilt their portfolio toward high-ESG stocks only if they expect to improve their risk-adjusted performance.

A less extreme tilt towards high-ESG stocks is also present for *exclusionary* and *mention only* funds, whereas funds engaging in activism, whether as *impact activists* or *opportunistic activists*, exhibit a spread in the average cumulative portfolio weight between the top and the bottom quintiles of about 20%, which is similar to the spread of *impact* funds. To be able to engage with and directly influence the management of a company requires a large enough stake, regardless of whether the ultimate goal is to affect only the financial performance the company, or also its sustainability impact.

3.1 Portfolio Ratings

Motivated by the evidence on the distribution of portfolio holdings across stocks with different ESG-ratings, we next investigate how the average ESG ratings at the fund portfolio level vary across the identified categories of ESG funds. To this end, we aggregate monthly firm ESG ratings

at the fund portfolio level, and consider different weighting schemes to single out the investment behavior of ESG funds.

Denoting firm i 's ESG-rating in month t by r_{it}^{ESG} , we construct the following four measures of fund portfolio ratings in a given month:

- *Long*: ESG ratings are weighted by the portfolio weights of the subset of stocks in which the fund is long,

$$\rho_{jt}^+ = \frac{\sum_i^{N_{jt}} w_{ijt}^+ r_{it}^{ESG}}{\sum_i^{N_{jt}} w_{ijt}^+} \quad (4)$$

where w_{ijt}^+ corresponds to the weight of asset i in the portfolio of fund j in month t if such weight is positive, and zero otherwise.

- *Short*: ESG ratings are weighted by the portfolio weights of the subset of stocks in which the fund is short,

$$\rho_{jt} = \frac{\sum_i^{N_{jt}} w_{ijt} r_{it}^{ESG}}{\sum_i^{N_{jt}} w_{ijt}} \quad (5)$$

where w_{ijt} corresponds to the weight of asset i in the portfolio of fund j in month t if such weight is negative, and zero otherwise. N_{jt} is the number of assets included in the portfolio of fund j in month t .

- *Over-weight*: ESG ratings are weighted by the excess portfolio weights of the subset of stocks that the fund overweights relative to its benchmark,

$$\rho_{jt}^{b+} = \frac{\sum_i^{M_{jt}} (w_{ijt} - w_{ijt}^b)^+ r_{it}^{ESG}}{\sum_i^{M_{jt}} (w_{ijt} - w_{ijt}^b)^+} \quad (6)$$

where $(w_{ijt} - w_{ijt}^b)^+$ corresponds to the difference in weight of asset i in the portfolio of fund j and that of its benchmark in month t if such difference is positive, and zero otherwise. M_{jt} is the total number of assets included in the union of the portfolio of fund j and its benchmark in month t . Fund benchmarks are identified as those that minimize the funds' active share in a given month (see [Cremers and Petajisto \(2009\)](#)).

- *Under-weight*: ESG ratings are weighted by the excess portfolio weights of the subset of stocks that the fund underweights relative to its benchmark,

$$\rho_{jt}^b = \frac{\sum_i^{M_{jt}} (w_{ijt} - w_{ijt}^b) r_{it}^{ESG}}{\sum_i^{M_{jt}} (w_{ijt} - w_{ijt}^b)} \quad (7)$$

where $(w_{ijt} - w_{ijt}^b)$ corresponds to the difference in weight of asset i in the portfolio of fund j and that of its benchmark in month t if such difference is negative, and zero otherwise.

In constructing the above four measures of fund portfolio ratings, we use MSCI ESG ratings at the firm level and standardize them within a given month to make them comparable across different time periods. Hence, in our baseline specification, we use

$$z_{it}^{ESG} = \frac{r_{it}^{ESG} - E_t[r_{it}^{ESG}]}{\sqrt{\text{Var}_t[r_{it}^{ESG}]}} \quad (8)$$

instead of r_{it}^{ESG} .¹¹

Since most mutual funds do not short-sell, the *short* measure is based on a small sample that does not lend itself to systematic statistical analysis. Hence, we analyze it separately, as a case study, in Section 3.2. We begin, instead, by analyzing mean differences in the *long*, *over-weight*, and *under-weight* measures across funds in different ESG categories utilizing the following empirical specification:

$$\rho_{jt}^x = \alpha + \beta \mathbf{1}_{jt}^{ESG\text{-category}} + \theta' X_{jt} + \iota_{MStar\ t} + \epsilon_{jt} \quad (9)$$

where $x \in \{f+, b+, b-\}$ characterizes one of the three portfolio rating measures, $\mathbf{1}_{jt}^{ESG\text{-category}}$ is a set of dummies for each ESG category (*Imp*, *Imp Act*, *Opp*, *Opp Act*, *Exc*, *Men*), X_{jt} is a vector of fund-level controls (log Age, log Assets, Expenses, Turnover, Fund Flows, Fund Flow Volatility, Fund-betas with respect to Fama-French-Carhart four factors), and $\iota_{MStar\ t}$ represents Morningstar category cross month fixed effects. We also run the above regression without ESG-category dummies, but including a single dummy for ESG funds. In all specifications, the baseline category represents non-ESG funds. The fixed effect structure, allows us to compare funds in each of the ESG categories to comparable non-ESG funds, belonging to the same Morningstar category in the same month. Table 3 reports the results of those regressions. We repeat all regressions using both the baseline ESG score from MSCI (Columns 1-3), as well as an industry-adjusted

¹¹Results based on non-standardized MSCI ESG-ratings are qualitatively similar and are reported in the Internet Appendix I.

ESG-rating, where scores are adjusted for the difference in baseline ratings of firms in different industries (Columns 4-6).

When comparing ESG funds all together against non-ESG funds (first row), we find that, ESG funds tend to hold long positions in, and overweight relative to their benchmarks, stocks that have higher ESG ratings. Specifically, looking at baseline ESG ratings, the rating of the long and the over-weight portfolios of ESG funds are on average 0.3 and 0.33 standard deviations higher than that of non-ESG funds, respectively. While they are 0.27 and 0.31 higher, respectively, when looking at the industry-adjusted metric. Those coefficients are all significant at the 1% level. On average, ESG funds also tend to underweight stocks that have lower ESG ratings, but with smaller magnitudes and statistical significance: 0.04 of a standard deviation for the baseline metric, with 5% significance for the baseline ESG metric; and 0.03 of a standard deviation but insignificant for the industry-adjusted metric. These results indicate that, as an overall group, ESG funds tend to tilt their portfolios more towards high ESG stocks and, to some extent, away from low ESG ones.

The average results reported above, though, do not imply that funds following any ESG strategy or implementation should behave consistently with this conclusion. The advantage of our method is that we are able to provide more detailed evidence as to which ESG strategies/implementations drive those average results. Indeed, when separating ESG funds into the six categories, we find interesting and novel patterns that underscore the importance of our granular classification methodology for capturing fund heterogeneity.

In line with the evidence in Table 2, looking at baseline ESG ratings, the ratings of the long and the over-weight portfolios of *impact* funds are on average 0.66 and 0.69 standard deviations higher than those of non-ESG funds, respectively. While they are 0.6 and 0.67 higher, respectively, when considering industry-adjusted metrics. These magnitudes are both statistically (at the 1% level) and economically significant. We find similar results when looking at *impact activist* funds. When considering the baseline ESG metric, their long and over-weight portfolios have an average rating which is 0.67 and 0.74 standard deviations higher than that of non-ESG funds, respectively. While they are 0.48 and 0.56 higher, respectively, when considering the industry-adjusted metric. All coefficients are significant at the 1% level. Results differ slightly with respect to under-weight portfolios. Indeed, there is some evidence that *impact* funds under-weight stocks with lower ESG-rating than non ESG-funds, while *impact activist* funds do not. That result, though, is only significant at the 5% level, when considering the baseline ESG metric, and it is not significant considering the industry-adjusted one. Taken together, these results indicate that funds with an impact objective, regardless of the strategy's implementation, tilt their portfolio towards stocks with significantly higher ESG ratings than non-ESG funds, as well as being higher than those of

the average ESG fund. Indeed the economic magnitude of these coefficients is roughly double that obtained for ESG funds as a whole.

Another relevant observation pertains to ESG-activist strategies. We generally think of such strategies as seeking firms with a lower ESG score to then nudge them towards improving their ESG standards. Somewhat consistent with that general belief, we note that, when adjusting ratings for their industry baseline, the magnitude of the over allocation of *impact activist* funds to firms with higher ESG ratings is lower than that of *impact* funds that do not adopt an activist approach. Still, the ESG rating of the stocks that *impact activist* funds invest in is higher than that of the stocks chosen by non-ESG funds. This could suggest that the objective of *impact activists* is to obtain marginal improvements in ESG-rating and not to select firms with very low ESG ratings and radically transform their policies.

Exclusionary funds, also display a positive tilt in the ESG rating of their long and over-weighted portfolios. The economic magnitude, though, is much smaller than that of *impact* or *impact activist* funds: 0.22 and 0.26 (0.20 and 0.25) standard deviations higher than non-ESG funds for the long and over-weight portfolios, respectively, using the baseline (industry-adjusted) metric. That is again consistent with a general reading of an exclusionary strategy. The exclusion of some likely low-ESG rated categories should increase the average rating of the available set of securities. Selection within that set, though, should not be correlated with the ESG rating of securities in the investible set. Hence, it is expected that the average rating of the selected portfolio would be lower than that of funds that actively tilt their weights on the bases of ESG considerations.

Results are starkly different when looking at funds with a purely risk-return oriented objective towards ESG investment. When considering our baseline specification, *opportunistic* funds are not statistically different from non-ESG funds. When considering industry adjusted ESG ratings, *opportunistic* funds display a slightly higher average ratings of their long and over-weight portfolios, which are small both statistically and economically—0.09 (10% significance) and 0.12 (5% significance) standard deviations higher than for non-ESG funds, respectively. *Opportunistic activist* funds, instead, display both a significantly higher ESG rating in their long and over-weight portfolios, and a significantly lower rating of their under-weight portfolio relative to non-ESG funds: 0.58 and 0.62 (0.52 and 0.58) standard deviations higher for the long and over-weight portfolios, respectively, and 0.14 (0.17) standard deviations lower for the under-weight portfolio, using the baseline (industry-adjusted) metric. These results are also consistent with a general reading of these strategies' objectives. Indeed, *opportunistic* funds should not have a particular preference over the direction of their tilt relative to a stock's ESG rating. They should simply utilize that information to exploit risk-adjusted return opportunities. That might imply over-weighting cer-

tain high-ESG stocks, while under-weighting others. It is not clear what the net effect of that activity should be, even if it is not surprising to observe that it is marginally positive, given the price pressure on high ESG stocks observed over the time period of our analysis.¹² When implementing the opportunistic strategy through activism, though, a long position is required in the target stocks. If conjecturing that also *opportunistic activist* funds would aim at bringing marginal improvements to the ESG standards of a company (now with the objective of, for instance, reducing its regulatory risks) it would make sense that they would over weight their allocation towards relatively high ESG rated firms and under weight their allocation towards relatively lower rated ones. Looking at the magnitude of those results, we observe that the ESG rating of the stocks they hold is similar to that of those held by *impact activist* funds but lower than that of the stocks held by *impact funds*, which is in line with that conjecture.

Finally, *mention only* funds hold portfolios that have ESG-ratings that are on average slightly higher than those of non-ESG funds, but similar in magnitude to what we observe for *opportunistic* ones. That is consistent with them utilizing ESG information for risk-return reasons. Even though other explanations might be equally plausible; e.g., some funds in this category might mention the use of ESG information to attract flows but might not effectively incorporate it in their decision making (i.e., greenwashing).

Distribution of portfolio ratings. Having analyzed mean differences across the portfolio ratings of ESG funds, it is instructive to look at their full distributions. Figure 7 presents the empirical distribution for each of the three measures of portfolio rating by comparing non-ESG funds to ESG funds as a whole (Column 1), and by dissecting the ESG distribution by ESG category (Column 2). Consistent with the findings in Table 3, the plots in Column 1 clearly show a higher mean in the average ESG ratings of stocks held by ESG funds in both the *long* and *over-weight* measures. The distributions for ESG and non-ESG funds, though, have a substantial overlap, such that it would be misleading to categorize funds as ESG or non-ESG just based on the ESG score of their holdings. The plots in Column 2 lead to similar conclusions: despite the apparent differences in mean, the large dispersion in holdings-based ESG ratings would make it unfeasible to use such ratings to identify the different ESG categories.

Disaggregate E, S, and G ratings. Having established our key findings on the ESG-ratings of fund portfolios, we next study the empirical relationship between ESG funds' portfolio holdings and the individual rating components (E, S, and G) of the stocks they hold. To this end, we consider the disaggregate E-, S-, and G-ratings provided by MSCI, we standardize them as in (8),

¹²In Section 3.2 we further document that those *opportunistic* funds which short-sell, tend to short sell stocks with a higher ESG rating than those sold short by non-ESG funds. That lends further support to this argument.

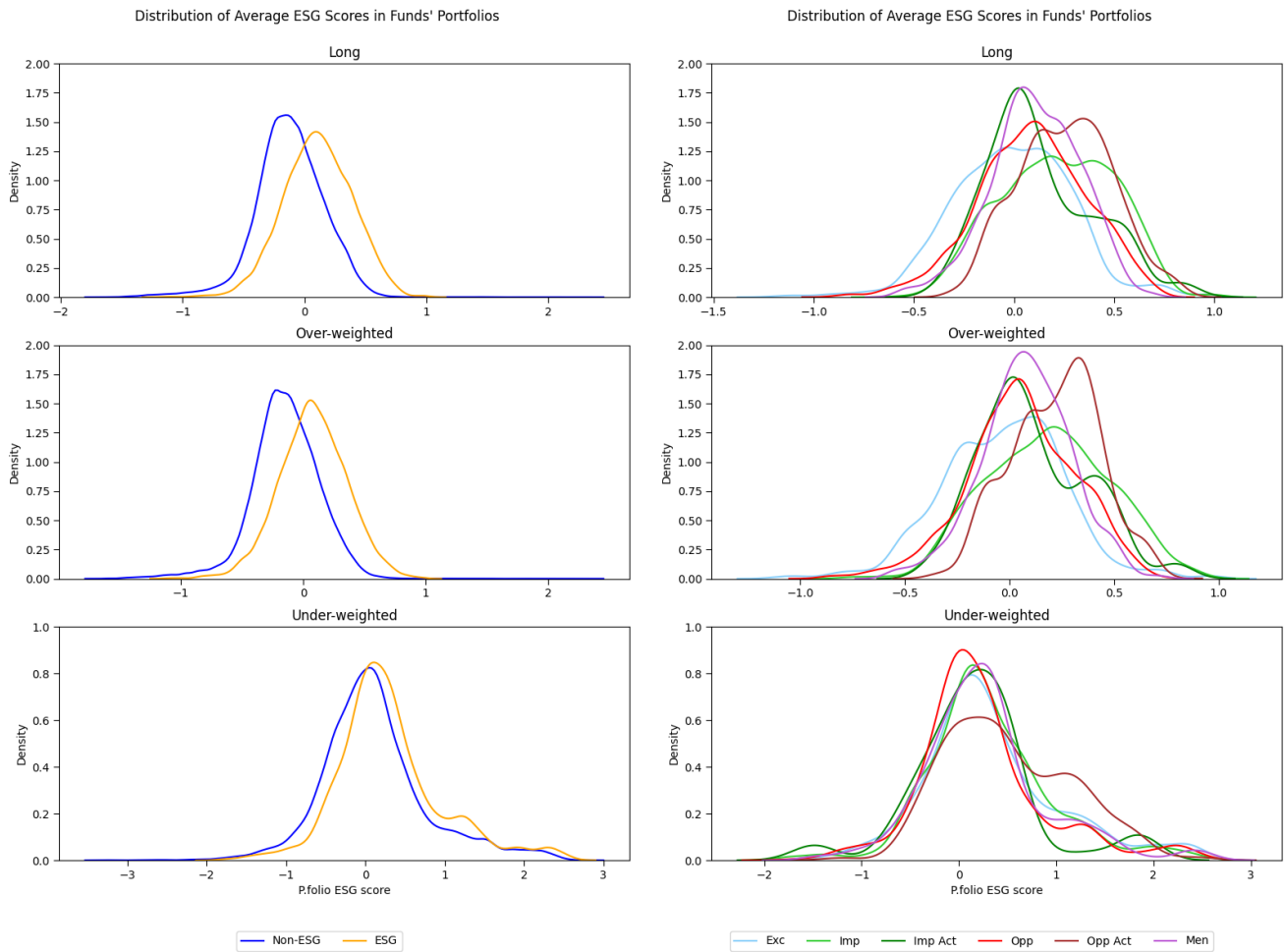


Figure 7: Distribution of Portfolio ESG-Ratings

Distribution of the average ESG score of the long (row 1), over-weight (row 1) and under-weight (row 3) portfolios of ESG vs. non-ESG funds (columns 1), and of ESG funds by type (column 2).

and for each of them: (i) we re-construct our four measures of fund portfolio ratings (*long*, *short*, *over-weight*, and *under-weight*), and (ii) we run the empirical specification in (9) for the *long*, *over-weight*, and *under-weight* measures. Table 4 reports the results.

We find that *impact* funds distinguish themselves from non-ESG funds by tilting their portfolios more towards high-E stocks, high-S stocks, as well as high-G stocks, both in absolute terms and relative to their benchmarks, but with a stronger economic magnitude for high-S stocks. Indeed, while the average E-rating and G-rating of the their long portfolios are 0.22 and 0.31 standard deviations higher than those of non-ESG funds, the average S-rating is 0.75 standard deviations higher. Focusing on *activist* funds, we document that, relative to non-ESG funds, *impact activists* tend to tilt their (long) portfolios more towards stocks with higher E- and S-ratings, whereas

opportunistic activists tend to concentrate more on stocks with higher S-ratings. Finally, Table 4 also shows that the findings based on the combined ESG-ratings of *exclusionary* funds are not representative of those based on each individual component. In contrast to the average E- and G-rating, the average S-rating of *exclusionary* funds' long portfolios is significantly higher (0.39 standard deviations) than that of non-ESG funds.

Importance of E, S, and G. The ESG-rating of a company is computed as a weighted average of the individual rating components E, S, and G, where the company and time-specific weights capture whether the actions that the company takes to address issues related to E, S and G are actually consequential for the overall sustainability of the company and society at large. To take this into account, we conduct an additional analysis on the individual rating components by considering the product of the individual rating and its weight. This allows us to better understand whether the portfolio tilts documented in Table 4 are towards companies whose actions are actually relevant for addressing key E-, S-, and G-related externalities.

Table 5 shows that, once the importance of E, S, and G is taken into account, the average weighted E- and of G-ratings of the *impact* funds' long portfolios become not statistically and economically different from those of non-ESG funds, whereas the the average weighted S-rating remains significantly higher. Moreover, only the exposure of the *impact activist* funds' long portfolio to higher E-rating stocks remain significantly different than that of non-ESG once we weight the ratings by their importance. For *opportunistic activist* funds, it is the exposure to both higher E-rating and higher S-rating stocks that remains significantly different. Finally, *exclusionary* funds become statistically indistinguishable from non-ESG funds.

These results indicate that funds in the various ESG categories display different specialization/preferences towards ESG characteristics. It is perhaps unexpected that the tilt of the portfolio of *impact* funds towards high-ESG stocks comes entirely from the Social component. While, only funds implementing ESG preferences through activism focus on the Environmental one.

3.2 Short-selling: A Case Study

In this section we report statistics about the ESG score of the *short* portfolios of mutual funds. Mutual funds are not prevented from short-selling by law, but they have strict disclosure restrictions. Funds who wish to short-sell, need to disclose it in their prospectus, where they often also set an overall limit for the amount of their portfolio that they are allowed to sell short. A common restriction is what is generally called the *130-30*, in which the fund is long 130% of their portfolio and short 30%. Less common restrictions are the *120-20* and the *150-50*. In terms of prevalence,

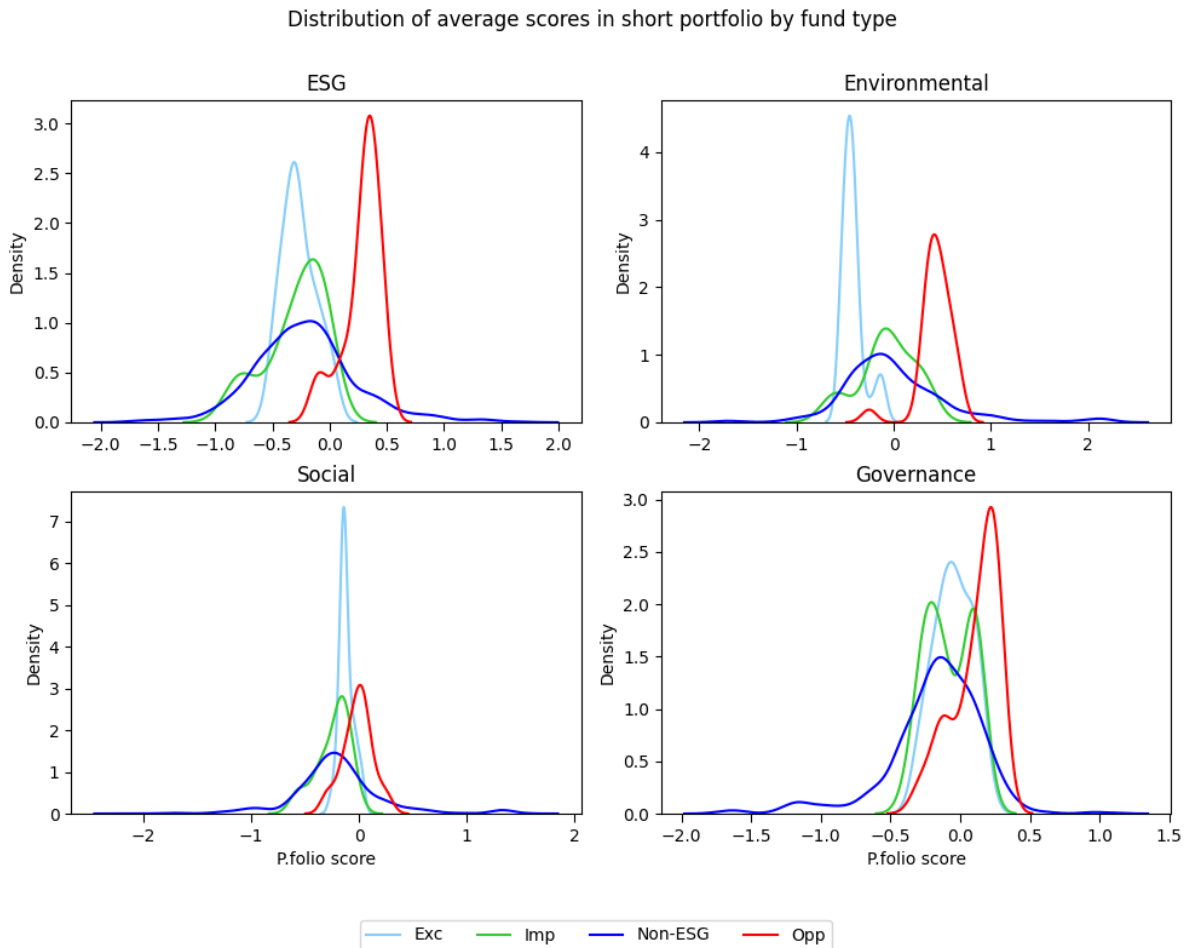


Figure 8: Short-selling Distribution

Distribution of the average ESG (row 1, column 1), Environmental (row 1, column 2), Social (row 1, column 1), and Governance (row 2, column 2) score of the short portfolios of non-ESG funds, and of ESG funds by type.

there are 55 funds in our sample who display any short-selling in their lifetime. That corresponds to about 2% of all fund-month observations. It is worth noting, that none of the 55 funds who display short-selling belongs to an ESG-activist category (*impact activist*, or *opportunistic activist*). That is expected, as an activist strategy necessarily requires having a long stake in a company in order to influence its decisions. Additionally, none of the *mention only* funds belongs to the short-selling sample.

Given the sample size, we cannot implement the same panel specification utilized for other portfolio components. Instead, we graphically represent differences in the ESG scores of the *short* portfolios of the 55 short-selling funds, split by their ESG type. Figure 8 displays those distributions for the overall ESG score, and for their E, S, and G components separately. The

most striking feature of those plots is that *opportunistic* funds short-sell stocks with a much higher ESG rating than those sold short by any other ESG type (including non-ESG funds). The magnitude of that tilt is particularly large when looking at the Environmental component, for which the average ESG-rating of stocks held is about 0.5 standard deviations larger than for non-ESG funds. Another interesting observation, is that *exclusionary* funds tend to short sell stocks with a low Environmental rating (lower than that of the stocks sold short by non-ESG funds). Finally, the short-selling activity of *impact* funds does not seem to be particularly different than that of non-ESG ones.

These observations, even if driven by a small sample, are supportive of the description of *opportunistic* strategies provided in fund prospectuses. Indeed, these funds claim not to have a directional preference over the ESG rating of the stocks they hold but to exploit risk-return opportunities that are correlated with the ESG rating of securities. In this case, it appears that, at least for some funds, those opportunities indicate an over-valuation of high ESG-rated companies, which is exploited through short-selling.

3.3 Trading Patterns

We conclude this section by providing preliminary evidence of the trading behavior of different ESG funds. To this end, we define the trading-induced change in stock i 's portfolio weight during month t , Δw_{ijt} , as stock i 's portfolio weight at the end of month t , w_{ijt} , minus stock i 's fictitious no-trade weight, \hat{w}_{ijt} , which is the portfolio weight that stock i would have if the fund did not engage in any trading activities. Formally,

$$\Delta w_{ijt} = w_{ijt} - \hat{w}_{ijt}, \quad (10)$$

where

$$\hat{w}_{ijt} = \frac{w_{ijt} (1 + R_{it})}{\sum_{i=1}^{N_{jt}} w_{jit} (1 + R_{it})}. \quad (11)$$

Table 6 reports, for each ESG fund category, the average monthly cumulative trading-induced portfolio change for the five quintiles of stock-level ESG-ratings. Differently from non-ESG funds, the trading activity of ESG funds tend to induce larger changes to the cumulative weight of stock in the top quintile than that of stocks in the bottom quintile, with *impact* funds, *impact activist* funds, and *opportunistic activist* funds exhibiting the largest spread. *Opportunistic* and *mention only* funds, instead, have the lowest spread among ESG funds. That further corroborates their

use of ESG information across all quintiles of the ESG-distribution, leading to large trades also among the lowest quintile.

4 Conclusion

In this paper we summarize definitions of ESG investment found in the theoretical literature under a unique guiding principle: how does ESG-related information enter the portfolio optimization problem of an investor. We then provide a detailed empirical counterpart of those definitions among active equity mutual funds in the US. That allows us to provide novel evidence of the prevalence and behavior of ESG investors with different objectives. Our main finding is that the majority of the growth in ESG investment in this area comes from what we define as *opportunistic* funds; i.e, those funds which use ESG-related information only with the objective of maximizing risk-adjusted returns. Whereas, funds that have ESG-related considerations in their objective function for non-pecuniary reasons, altogether only represent 25% of the funds and 8% of the AUM of ESG-related active mutual funds by 2022. A more detailed portfolio analysis uncovers that funds with different ESG objectives display very different portfolios and trading behavior. With only *impact*, *impact activist* and *opportunistic activist* funds displaying significantly greater ESG ratings of stocks held. Making this distinction is important in the study of ESG investors as funds that use ESG information with different objectives might attract investors with different preferences and have different financial and real outcomes. By lumping all ESG funds together we are at risk of obtaining biased estimates of investor preferences for non-pecuniary preferences, erroneously labeling certain investment vehicles as “greenwashing”, and potentially assigning inappropriate benchmarks to funds.

APPENDIX

A ESG Dictionary

ESG-related terminology. ESG, environmental, carbon, SRI, human rights, green, climate change, renewable energy, social responsibility, pollution, sustainable business practice, sustainable development goals, clean energy, SDG, greenhouse emissions, greenhouse gas emissions, cluster munitions, child labor, alternative energy, solar, adopt more responsible, adopt responsible, implement responsible, responsible supply, biblically responsible, catholic church, islam, toxic, irresponsible marketing, gambling, tobacco, palm oil, pesticides, small arms, thermal coal, nuclear, alcohol, animal testing, adult entertainment, fossil fuel, weapons, specialty leather, genetically modified organism, military contracting, abortion, stem cells, pornography, firearm, handgun, liquor, casino, anti-family, terrorism, social screens, environmental screens, governance screens.

ESG-terms searched in fund names. ESG, SRI, SDG, CSR, environment, social, governance, impact, climate, equality, ethic, responsible, green, clean, sustain, renew, diversity, women, low carbon, progressive energy, fossil fuel free, alternative energy, energy solution, eco leader, ecological strategy.

B Examples of ESG Categories

This section reports example extracts from PIS sections that were classified in each of the ESG categories defined in Section 2.

B.1 Exclusionary

Fund name: Alger Responsible Investing Fund; Date: 2018-03-31

under normal circumstances, the fund invests at least % of its net assets, plus any borrowings for investment purposes, in equity securities of companies of any size with an environmental, social and governance esg rating of bb or above by msci or an equivalent rating by another esg rating agency that also demonstrate, in the view of fred alger management, inc. , promising growth potential. (...) fred alger management, inc. employs fundamental analysis to identify innovative and dynamic companies and uses msci's esg ratings to consider how such stocks rank within an industry or sector based on a company's conduct in offering products or services that promote positive environmental, social and/or governance policies, or have a positive impact in these areas, addressing concerns such as climate change, resource depletion, health and safety, employee relations and diversity, bribery and corruption, and fostering board diversity and structure. the fund does not bar companies in any industries.

Fund name: Northern US Quality ESG Fund; Date: 2019-08-31

in seeking long-term capital appreciation, the fund will invest, under normal circumstances, at least % of its net assets plus borrowings for investment purposes in equity securities

of large and mid-capitalization United States companies that nti believes have favorable environmental, social and governance esg characteristics under a third-party vendors rating methodology. (...) Using a quantitative, factor based approach, the fund intends to invest in companies that: i meet certain criteria for esg factors as provided by a third-party research vendor; ii exhibit strong business fundamentals, solid management and reliable cash flows; and iii are located, headquartered in, incorporated in or otherwise organized in the united states. (...) the fund is managed according to a quantitative model developed by nti to define an investable universe, nti excludes securities of companies involved in esg controversies or those that violate global norms like the united nations global compact. nti also removes companies that do a poor job of managing their esg risks and opportunities relative to their peers as well as those with material involvement in controversial business practices, including, but not limited to, tobacco and civilian firearms. nti engages a third-party research vendor to provide esg data for United States companies. the third-party vendor identifies esg areas of risk and opportunity, evaluates exposure and management, and ranks and rates companies against their industry peers. after defining the investable universe, nti evaluates the quality of the remaining securities and removes those securities that do not meet the proprietary quality methodology. (...) the fund is constructed based on an optimization methodology designed to take active exposure by overweighting and underweighting securities based on their esg and relative financial quality rankings. (...) further, the carbon footprint of the portfolio is reduced relative to the companies in the benchmark russell index.

Fund name: Wells Fargo Large Cap Core Fund; Date: 2020-11-30

(...) generally, we avoid investments in issuers we deem to have significant alcohol, gaming or tobacco business.

B.2 Impact

Fund name: Eventide Gilead Fund, date: 2017-04-30

The funds investment adviser, eventide asset management, llc eventide or the adviser analyzes the performance of potential investments not only for financial strengths and outlook, but also for the company's ability to operate with integrity and create value for customers, employees, and other stakeholders. While few companies may reach these ideals in every area of their business, these principles articulate the advisers highest expectations for corporate behavior. (...) The adviser seeks to invest in companies that reflect the following values: respecting the value and freedom of all people; this includes the right to life at all stages and freedom from addictive behaviors caused by gambling, pornography, tobacco and alcohol. Demonstrating a concern for justice and peace through fair and ethical relationships with customers, suppliers and business partners and through avoidance of products and services that promote weapons production and proliferation. Promoting family and community; this includes protecting children from violent forms of entertainment and also includes serving low income communities. Exhibiting responsible management practices, including fair-dealing with employees, communities, competitors, suppliers and customers as demonstrated by a company's record regarding litigation, regulatory actions against the company and its record of promoting products and services that improve the lives of people. Practicing environmental stewardship; this includes practices considered more sustainable than those of industry peers,

reduction in environmental impact when compared to previous periods, and/or the use of more efficient and cleaner energy sources. Consistent with the advisers values, the fund may also invest in community development institutions that serve the financial needs of low-to-moderate income families and communities.

Fund name: Domini Impact Equity Fund; Date: 2018-12-31

The fund will invest in companies that Domini Impact Investments llc Domini believes have strong environmental and social profiles. The fund may also invest in companies that Domini believes help create products and services that provide sustainability solutions and are evaluated using fundamental analysis. The fund may sell a security if the issuer fails to meet Domini's social and environmental standards or sustainability themes. (...) While pursuing their financial objectives, impact investors seek to use their investments to create a more fair and sustainable world. Domini believes that by factoring social and environmental sustainability standards into their investment decisions, investors can encourage greater corporate accountability. Domini evaluates the funds potential investments against its social and environmental standards based on the businesses in which an issuer engages, as well as on the quality of the issuers relations with key stakeholders, including communities, customers, ecosystems, employees, investors, and suppliers. Domini's interpretation and application of its social and environmental standards are subjective and may evolve over time.

Fund name: Neuberger Berman Sustainable Equity Fund; Date: 2020-12-31

The portfolio managers employ a research driven and valuation sensitive approach to stock selection, with a focus on long term sustainability. This sustainable investment approach seeks to identify high quality, well-positioned companies with leadership that is focused on ESG as defined by best in class operating practices. (...) Among companies that meet these criteria, the portfolio managers look for those that show leadership in environmental, social and governance considerations, including progressive workplace practices and community relations. In addition, the portfolio managers typically look at a company's record in public health and the nature of its products. The portfolio managers judge firms on their corporate citizenship overall, considering their accomplishments as well as their goals. While these judgments are inevitably subjective, the fund endeavors to avoid companies that derive revenue from gambling or the production of alcohol, tobacco, weapons, or nuclear power. The fund also does not invest in any company that derives its total revenue primarily from non-consumer sales to the military.

B.3 Impact Activist

Fund name: 13D Activist Fund; Date: 2018-02-28

When making an investment decision, the adviser also evaluates and considers environmental, social and governance ESG factors, with a strong emphasis on corporate governance. generally, a significant majority of portfolio positions will have a shareholder representative on the board of directors who advocates for best in class corporate governance practices and a shareholder focused mentality. While some of these investments will be in companies with good corporate governance practices, unlike other ESG investors, many will be in situations

where an activist is attempting to remedy poor corporate governance. This can range from implementing best corporate governance practices to completely changing corporate culture and replacing entrenched, conflicted and self-dealing management teams. We also expect that these shareholder representatives who sit on the boards of our portfolio companies will be monitoring, encouraging and implementing responsible social and environmental corporate policies. The adviser believes that many of the companies which the adviser selects for investment by the fund provide an opportunity to improve the ESG characteristics of those companies.

Fund name: Miller-Howard Income-Equity Fund; Date: 2020-03-31

The fund integrates rigorous, fundamental financial analysis with environmental, social and governance ESG analysis. The adviser analyzes key ESG criteria that may include a company's governance and ethics, environmental record, workplace policies, human rights record, especially relating to international operations, and the nature of its products and services. The adviser employs a multi-faceted ESG strategy that includes screening, direct engagement with companies, and active proxy voting. The adviser considers both the financial and ESG profiles of a candidate in making the final decision.

Fund name: AMG FUNDS I; Date: 2022-01-31

The sub-adviser evaluates financial and sustainability criteria in seeking to identify companies that provide products or services enabling solutions that positively impact society and address sustainability challenges globally, as determined by Boston Common, with reference in part to the united nations sustainable development goals SDGs . (...) The sub-adviser integrates sustainability criteria into the stock selection process and applies its sustainability criteria to each potential investment. The sub-adviser prefers firms that seek to work toward at least one of the SDGs with innovative approaches to environmental or social challenges through their products and services, as well as their policies or practices. The sub-adviser believes that evaluating a company's contributions to areas such as climate change, water scarcity, human rights, and labor practices requires a nuanced, judgment-based approach. The sub-adviser uses criteria that are industry-specific and evaluates each company in relation to its peers. The sub-adviser typically seeks companies with a superior record on environmental, social, and governance ESG issues as determined by the sub-adviser, as well as a commitment to good standards and compliance. The sub-adviser also seeks to invest in companies that it believes recognize the effect of their supplier standards on vendors practices and work to improve practices in their supply chains. Conversely, the sub-adviser looks to avoid companies that it views as egregious violators of regulations; those that appear to exhibit a pattern of negligence on ESG issues; and those that have a deteriorating record on measurable conduct in these areas. The fund may invest in companies that do not yet meet the sub-adviser's sustainability criteria in all areas if they meet the sub-adviser's comprehensive ESG guidelines and if, in the judgment of the sub-adviser, they have made or seek to make meaningful positive contributions to ESG issues including those described by the SDGs through their products and services and/or policies and practices. In such cases, the fund may exercise its rights as a shareholder to practice constructive engagement and encourage management to adopt more responsible policies. The sub-adviser employs active shareowner engagement to raise ESG issues with the management of select portfolio companies. Through this effort, the sub-adviser seeks to encourage company management teams toward greater transparency, accountability, disclosure, and commitment to ESG issues.

B.4 Opportunistic

Fund name: UBS US Small Cap Growth Fund; Date: 2020-10-31

The fund is classified by UBS am Americas as an ESG-integrated fund. The fund's investment process integrates material sustainability and/or environmental, social and governance ESG considerations into the research process. ESG integration is driven by taking into account material ESG risks which could impact investment returns, rather than being driven by specific ethical principles or norms. The analysis of material sustainability/ESG considerations can include many different aspects, including, for example, the carbon footprint, employee health and well-being, supply chain management, fair customer treatment and governance processes of a company. The fund's portfolio managers may still invest in securities with a higher ESG risk profile where the portfolio managers believe the potential compensation outweighs the risks identified.

Fund name: Artisan Value Fund; Date: 2022-01-31

As part of the teams analysis of a company's business prospects, among other factors, the team considers certain environmental, social and governance ESG factors relating to the company. These ESG factors may include the impact of environmental regulatory change, the use of human, natural and physical resources and corporate governance structures and practices. When the team deems a factor material to the value of a company, the team incorporates it into its decision-making process.

Fund name: Hartford Equity Income Fund; Date: 2022-02-28

As part of this analysis, Wellington Management evaluates financial and competitive conditions, management quality, potential earnings, free cash flow, dividends, and other related measures or indicators of value, including financially material environmental, social, and/or governance ESG characteristics based on Wellington Managements proprietary ESG research. Wellington Management believes the integration of financially material ESG characteristics into its investment process allows it to better assess strategic business issues that may impact the long-term quality, dividend sustainability, and ultimately the performance of a company. The factors that Wellington Management considers as part of its fundamental analysis, including the assessment of financially material ESG characteristics, contribute to its overall evaluation of a company's risk and return potential.

B.5 Opportunistic Activist

Fund name: MAINSTAY FUNDS TRUST; Date: 2022-02-28

The sub-advisor may give consideration to financially material environmental, social and/or governance ESG criteria including, but not limited to, climate mitigation and resilience, corporate culture, as well as executive compensation and senior-level succession planning. When evaluating investments for the fund, the sub-advisor has access to proprietary ESG research to help evaluate a company's risk and return potential. The sub-advisor believes the integration of financially material ESG factors into its investment process allows it to

better assess strategic business issues that may impact the performance of a company. ESG factors are one of several factors considered when making an investment decision for the fund. The sub-advisor has discretion to determine the materiality of as well as the level at which financially relevant ESG factors are embedded into its overall fundamental analysis when making an investment decision. The sub-advisor also engages with management of certain companies regarding corporate governance practices as well as what it deems to be materially important environmental and/or social issues facing a company.

Fund name: Morgan Stanley Insight Fund; Date: 2021-03-31

The adviser actively integrates sustainability into the investment process by using environmental, social and governance esg factors as a lens for additional fundamental research, which can contribute to investment decision-making. The adviser seeks to understand how environmental and social initiatives within companies can create value by strengthening durable competitive advantages, creating growth opportunities, driving profitability and/or aligning with secular growth trends. The adviser generally engages with company management teams to discuss their esg practices, with the aim of identifying how sustainability themes present opportunities and risks that can be material to the value of the security over the long-term. other aspects of the investment process include a proprietary, systematic evaluation of governance policies, specifically focusing on compensation alignment on long-term value creation. The adviser does not treat esg as a deterministic, reductive screen, nor as a portfolio construction tool layered on top of a passive vehicle.

Fund name: Boston Trust SMID Cap Fund; Date: 2021-04-30

The adviser evaluates financially material environmental, social, and governance ESG factors as part of the investment decision-making process for the fund. The adviser considers financial materiality as it is understood in generally accepted accounting principles information that would influence the judgment of an informed investor. The adviser assesses the impact that ESG factors may have on revenues, expenses, assets, liabilities, and overall risk. In addition, the adviser utilizes active ownership to encourage sustainable business policies and practices and greater ESG transparency. Active ownership strategies include proxy voting, dialogue with company management, sponsorship of shareholder resolutions, and public policy advocacy.

B.6 Mention Only

Fund name: Hartford Dividend & Growth Fund; Date: 2019-03-31

(...) Wellington management also evaluates a company's business environment, management quality, balance sheet, income statement, anticipated earnings, revenues and dividends, and other related measures or indicators of value, including certain environmental, social and/or governance ESG factors.

Fund name: GMO Quality Fund; Date: 2021-06-30

In addition, gmo may consider esg environmental, social, and governance criteria as well as trading patterns, such as price movement or volatility of a security or groups of securities.

Fund name: Franklin Mutual US Value Fund; Date: 2022-02-28

(...) environmental, social and governance ESG related assessments of companies are also considered (...)

Table 1: Classification Comparison: False Positives and False Negatives

This table compares our classification of ESG funds with Morningstar’s Sustainability categorization (variable: *Sustainable Investment Overall*), and with a classification based on the presence of sustainability-related terms in the fund name (see Appendix A for a full list of terms). In Panel A, we consider as sustainable any fund that is categorized by us as *impact* or *impact activist*. In Panel B, we consider as sustainable any fund that is categorized by us as *impact*, *impact activist* or *exclusionary*. False positive rates are computed as the percentage of observations categorized as sustainable by the alternative methods (Morningstar or Fund Name) that are *not* categorized as sustainable using our methodology. False negative rates are computed as the percentage of observations categorized as sustainable using our methodology that are *not* categorized as sustainable using the alternative methods (Morningstar or Fund Name). All statistics for the Fund Name categorization are based on the full time period of our analysis (2015-2022), while statistics for the Morningstar categorization are based on a shorter time period (2020-2022), due to data availability.

Panel A: Impact and Impact Activist Funds		
	Morningstar	Fund Name
False Positive (Type 1 Error)	48%	47%
False Negative (Type 2 Error)	19%	84%
Panel B: Impact, Impact activist and Exclusionary Funds		
	Morningstar	Fund Name
False Positive (Type 1 Error)	41%	33%
False Negative (Type 2 Error)	49%	90%

Table 2: Conditional Distributions of Portfolio Holdings

This table presents the conditional distribution of portfolio holdings in each of the ESG funds based on our classification (*exclusionary (Exc)*, *impact (Imp)*, *impact activist (Imp Act)*, *opportunistic (Opp)*, *opportunistic activist (Opp Act)*, or *mention only (Men)*). In Panel A we consider the average percentage of stocks held in each quintile of ESG-ratings, computed at the stock level each month. Panel B presents the portfolio weight held in each quintile of ESG-ratings, computed at the stock-level each month. In both panels we include Non-ESG funds as a reference group.

Panel A: % of Stocks							
q of ESG-ratings	Non-ESG Funds	ESG Funds					
		Exc	Imp	Imp Act	Opp	Opp Act	Men
q1	19.06	16.56	11.52	11.78	17.43	11.67	15.32
q2	19.71	18.42	16.14	16.43	18.53	16.31	19.29
q3	19.93	19.56	18.90	17.66	20.20	19.56	21.32
q4	20.41	21.26	22.95	21.93	21.30	23.24	21.47
q5	21.10	24.59	31.04	32.62	22.97	29.64	22.66
q5-q1	2.04	8.03	19.52	20.84	5.54	17.97	7.34
Panel B: Cumulative Portfolio Weights							
q of ESG-ratings	Non-ESG Funds	ESG Funds					
		Exc	Imp	Imp Act	Opp	Opp Act	Men
q1	17.98	15.11	9.50	11.00	14.88	10.36	13.60
q2	17.68	16.97	14.52	15.37	16.54	15.25	17.16
q3	17.76	17.52	17.44	18.37	18.63	18.64	19.59
q4	17.40	18.80	20.03	20.32	19.33	21.23	19.54
q5	19.91	23.60	31.47	31.03	22.75	29.56	22.51
q5-q1	1.93	8.49	21.97	20.04	7.87	19.20	8.91

Table 3: Standardized ESG Ratings Across ESG Funds

This table presents results that characterize how the ESG ratings of the ESG Funds we identify differ from those of Non-ESG funds, using the following regression specification:

$$\rho_{jt}^x = \alpha + \beta \mathbf{1}_{jt}^{ESG\text{-category}} + \theta' X_{jt} + \iota_{MStar\ t} + \epsilon_{jt}$$

where ESG ratings are standardized according to eq. 8; $x \in \{+, b+, b-\}$ characterizes one of the three portfolio rating measures: long, over-weight or under-weight; $\mathbf{1}_{jt}^{ESG\text{-category}}$ is a dummy for *ESG Funds* in the top panel, and a set of dummies for each ESG category (*Imp*, *Imp Act*, *Opp*, *Opp Act*, *Exc*, *Men*), in the bottom panel; X_{jt} is a vector of fund-level controls, which includes log Age, log Assets, Expenses, Turnover, Fund Flows, Fund Flow Volatility, Fund-betas with respect to Fama-French-Carhart four factors; $\iota_{MStar\ t}$ represents Morningstar category cross month fixed effects. Standard errors are clustered at the fund + month level.

	ESG-ratings			Industry Adjusted ESG-ratings		
	long (1)	over (2)	under (3)	long (4)	over (5)	under (6)
ESG	0.088*** (7.11)	0.095*** (7.37)	-0.013** (-2.09)	0.087*** (6.82)	0.096*** (7.12)	-0.010 (-1.35)
AdjR2	0.602	0.533	0.845	0.690	0.614	0.815
Exc	0.065*** (2.98)	0.074*** (3.35)	0.011 (1.05)	0.065** (2.58)	0.076*** (3.04)	0.029** (2.11)
Imp	0.192*** (7.49)	0.199*** (6.73)	-0.038** (-2.09)	0.192*** (6.71)	0.203*** (5.99)	-0.031 (-1.47)
Imp Act	0.196*** (4.94)	0.213*** (5.28)	-0.033 (-1.62)	0.153*** (3.38)	0.172*** (3.86)	-0.033 (-1.36)
Opp	0.024 (1.26)	0.031 (1.62)	-0.006 (-0.75)	0.030* (1.75)	0.038** (2.22)	-0.011 (-1.19)
Opp Act	0.170*** (6.91)	0.178*** (6.97)	-0.044*** (-3.68)	0.167*** (6.06)	0.178*** (6.27)	-0.055*** (-3.68)
Men	0.035** (2.44)	0.041** (2.54)	-0.011 (-1.62)	0.034** (2.09)	0.038* (1.96)	-0.021** (-2.45)
AdjR2	0.607	0.538	0.846	0.693	0.618	0.816
Controls	Y	Y	Y	Y	Y	Y
MStar Month FE	Y	Y	Y	Y	Y	Y
Obs	116337	116335	116337	116337	116335	116337
\bar{y} for Non-ESG	-0.119	-0.144	-0.128	-0.073	-0.115	-0.067
$\sigma(y)$	0.292	0.288	0.309	0.321	0.305	0.322

Table 4: Standardized E, S, and G Ratings Across ESG Funds

This table presents results that characterize how individual E/S/G ratings of the ESG Funds we identify differ from those of non-ESG funds, using the following regression specification:

$$\rho_{jt}^x = \alpha + \beta \mathbf{1}_{jt}^{ESG\text{-category}} + \theta' X_{jt} + \iota_{MStar\ t} + \epsilon_{jt}$$

where E/S/G ratings are standardized according to eq. 8; $x \in \{f+, b+, b-g\}$ characterizes one of the three portfolio rating measures: long, over-weight or under-weight; $\mathbf{1}_{jt}^{ESG\text{-category}}$ is a dummy for *ESG Funds* in the top panel, and a set of dummies for each ESG category (*Imp, Imp Act, Opp, Opp Act, Exc, Men*), in the bottom panel; X_{jt} is a vector of fund-level controls, which includes log Age, log Assets, Expenses, Turnover, Fund Flows, Fund Flow Volatility, Fund-betas with respect to Fama-French-Carhart four factors; $\iota_{MStar\ t}$ represents Morningstar category cross month fixed effects. Standard errors are clustered at the fund + month level.

	E-ratings			S-ratings			G-ratings		
	long (1)	over (2)	under (3)	long (4)	over (5)	under (6)	long (7)	over (8)	under (9)
ESG	0.043*** (3.05)	0.049*** (3.25)	0.015 (1.65)	0.069*** (5.90)	0.073*** (6.04)	-0.019*** (-3.96)	0.026*** (3.99)	0.029*** (4.27)	-0.007** (-2.21)
AdjR2	0.777	0.696	0.818	0.428	0.317	0.781	0.650	0.609	0.883
Exc	0.017 (0.45)	0.015 (0.41)	0.062*** (3.15)	0.085*** (3.55)	0.090*** (3.75)	-0.019** (-2.34)	0.004 (0.27)	0.011 (0.69)	-0.011 (-1.42)
Imp	0.096*** (3.94)	0.090*** (2.85)	0.006 (0.28)	0.164*** (6.06)	0.171*** (6.15)	-0.034** (-2.43)	0.063*** (4.56)	0.069*** (5.35)	-0.021** (-2.60)
Imp Act	0.193*** (3.58)	0.226*** (3.91)	-0.008 (-0.26)	0.078*** (2.69)	0.079** (2.57)	-0.031** (-2.01)	0.017 (0.77)	0.017 (0.68)	-0.001 (-0.04)
Opp	0.011 (0.72)	0.023 (1.33)	0.008 (0.75)	0.004 (0.26)	0.008 (0.51)	-0.002 (-0.33)	0.017* (1.90)	0.014 (1.47)	-0.007* (-1.77)
Opp Act	0.097*** (4.08)	0.138*** (5.75)	-0.031 (-1.24)	0.114*** (5.63)	0.106*** (5.24)	-0.035*** (-3.44)	0.050*** (3.65)	0.047*** (3.43)	0.006 (0.86)
Men	0.013 (0.67)	0.017 (0.76)	-0.015 (-1.57)	0.011 (0.74)	0.011 (0.72)	-0.017** (-2.51)	0.020** (2.56)	0.025*** (2.68)	0.009** (2.47)
AdjR2	0.778	0.697	0.818	0.434	0.324	0.782	0.651	0.610	0.883
Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y
MStar Month FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Obs	116337	116335	116337	116337	116335	116337	116337	116335	116337
\bar{y} for Non-ESG	0.114	0.061	0.145	-0.168	-0.182	-0.197	-0.063	-0.051	-0.094
$\sigma(y)$	0.430	0.408	0.411	0.219	0.215	0.179	0.205	0.209	0.179

Table 5: Standardized Weighted E, S, and G Ratings Across ESG Funds

This table presents results that characterize how individual E/S/G ratings (weighted by their importance) of the ESG Funds we identify differ from those of non-ESG funds, using the following regression specification:

$$\rho_{jt}^x = \alpha + \beta \mathbf{1}_{jt}^{ESG\text{-category}} + \theta' X_{jt} + \iota_{MStar\ t} + \epsilon_{jt}$$

where E/S/G ratings are standardized according to eq. 8; $x \in \{+, b+, b-\}$ characterizes one of the three portfolio rating measures: long, over-weight or under-weight; $\mathbf{1}_{jt}^{ESG\text{-category}}$ is a dummy for *ESG Funds* in the top panel, and a set of dummies for each ESG category (*Imp, Imp Act, Opp, Opp Act, Exc, Men*), in the bottom panel; X_{jt} is a vector of fund-level controls, which includes log Age, log Assets, Expenses, Turnover, Fund Flows, Fund Flow Volatility, Fund-betas with respect to Fama-French-Carhart four factors; $\iota_{MStar\ t}$ represents Morningstar category cross month fixed effects. Standard errors are clustered at the fund + month level.

	weighted E-ratings			weighted S-ratings			weighted G-ratings		
	long (1)	over (2)	under (3)	long (4)	over (5)	under (6)	long (7)	over (8)	under (9)
ESG	0.023*** (2.86)	0.024*** (2.76)	-0.008* (-1.84)	0.054*** (4.47)	0.055*** (4.34)	-0.008 (-1.28)	0.019** (2.32)	0.027*** (3.15)	0.006 (1.45)
AdjR2	0.499	0.467	0.685	0.463	0.383	0.683	0.638	0.629	0.860
Exc	0.011 (0.58)	0.007 (0.34)	0.005 (0.71)	0.048 (1.63)	0.053* (1.75)	0.005 (0.55)	0.014 (0.72)	0.028 (1.35)	0.001 (0.18)
Imp	0.023 (1.35)	0.023 (1.15)	-0.008 (-0.63)	0.140*** (4.97)	0.142*** (4.63)	-0.027 (-1.33)	0.059*** (3.43)	0.067*** (4.22)	-0.005 (-0.46)
Imp Act	0.119*** (3.84)	0.133*** (3.99)	-0.027 (-1.55)	0.046 (1.48)	0.035 (1.10)	-0.004 (-0.26)	0.029 (0.86)	0.045 (1.47)	0.001 (0.11)
Opp	0.014 (1.32)	0.017 (1.37)	-0.015*** (-2.64)	0.011 (0.87)	0.015 (1.04)	0.007 (1.05)	-0.004 (-0.33)	-0.002 (-0.15)	0.007 (1.38)
Opp Act	0.068*** (3.53)	0.080*** (3.61)	-0.045*** (-2.67)	0.073*** (4.04)	0.062*** (3.31)	-0.012 (-0.71)	0.034* (1.96)	0.039** (2.06)	0.028** (2.56)
Men	0.015 (1.52)	0.016 (1.51)	0.001 (0.13)	0.017 (1.09)	0.017 (0.96)	-0.025*** (-3.02)	0.003 (0.33)	0.011 (0.89)	0.015** (2.60)
AdjR2	0.500	0.469	0.685	0.466	0.386	0.683	0.638	0.630	0.860
Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y
MStar Month FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Obs	116337	116335	116337	116337	116335	116337	116337	116335	116337
\bar{y} for Non-ESG	-0.319	-0.317	-0.204	-0.042	-0.062	-0.172	0.418	0.404	0.375
$\sigma(y)$	0.184	0.198	0.157	0.254	0.255	0.201	0.277	0.294	0.238

Table 6: Conditional Distributions of Trading-induced Portfolio Changes

This table presents the average monthly cumulative trading-induced portfolio changes within each quintile of stock-level ESG ratings, for non-ESG funds and the different types of ESG funds we identify (*Exc*, *Imp*, *Imp Act*, *Opp*, *Opp Act*, *Men*). Trading-induced portfolio changes are computed according to (10).

Panel A: Cumulative Trading-induced Portfolio Changes							
q of ESG-ratings	Non-ESG Funds	ESG Funds					
		Exc	Imp	Imp Act	Opp	Opp Act	Men
q1	2.16	1.55	1.09	0.86	1.39	0.78	1.29
q2	1.97	1.61	1.30	1.07	1.40	0.95	1.43
q3	1.92	1.66	1.50	1.33	1.56	1.12	1.68
q4	1.85	1.73	1.70	1.32	1.57	1.40	1.63
q5	1.89	2.03	2.27	1.90	1.75	1.66	1.65
q5-q1	-0.27	0.48	1.18	1.04	0.35	0.88	0.36

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INTERNET APPENDIX

"Different Shades of ESG Funds"

by Simona Abis, Andrea M. Buà and Meha Sadasivam

I Non-standardized MSCI ESG-ratings

Table IA.1: ESG Ratings Across ESG Funds

This table presents results that characterize how the ESG ratings of the ESG Funds we identify differ from those of Non-ESG funds, using the following regression specification:

$$\rho_{jt}^x = \alpha + \beta \mathbf{1}_{jt}^{ESG\text{-category}} + \theta X_{jt} + \iota_{MStar\ t} + \epsilon_{jt}$$

where ESG ratings are not standardized; $x \in \{f, b, g\}$ characterizes one of the three portfolio rating measures: long, over-weight or under-weight; $\mathbf{1}_{jt}^{ESG\text{-category}}$ is a dummy for *ESG Funds* in the top panel, and a set of dummies for each ESG category (*Imp, Imp Act, Opp, Opp Act, Exc, Men*), in the bottom panel; X_{jt} is a vector of fund-level controls, which includes log Age, log Assets, Expenses, Turnover, Fund Flows, Fund Flow Volatility, Fund-betas with respect to Fama-French-Carhart four factors; $\iota_{MStar\ t}$ represents Morningstar category cross month fixed effects. Standard errors are clustered at the fund + month level.

	ESG-ratings			Industry Adjusted ESG-ratings		
	long (1)	over (2)	under (3)	long (4)	over (5)	under (6)
ESG	0.095*** (7.04)	0.104*** (7.31)	-0.013** (-2.01)	0.195*** (6.81)	0.217*** (7.11)	-0.023 (-1.33)
AdjR2	0.641	0.583	0.864	0.720	0.656	0.835
Exc	0.071*** (2.96)	0.081*** (3.34)	0.012 (1.08)	0.147** (2.58)	0.171*** (3.04)	0.065** (2.11)
Imp	0.209*** (7.42)	0.216*** (6.70)	-0.040** (-2.05)	0.433*** (6.70)	0.457*** (5.99)	-0.070 (-1.46)
Imp Act	0.217*** (5.00)	0.236*** (5.36)	-0.036 (-1.60)	0.346*** (3.38)	0.388*** (3.87)	-0.074 (-1.36)
Opp	0.027 (1.30)	0.035 (1.66)	-0.007 (-0.77)	0.067* (1.76)	0.086** (2.23)	-0.024 (-1.19)
Opp Act	0.180*** (6.84)	0.189*** (6.89)	-0.047*** (-3.70)	0.374*** (6.05)	0.399*** (6.26)	-0.124*** (-3.69)
Men	0.037** (2.43)	0.044** (2.52)	-0.012 (-1.61)	0.076** (2.09)	0.084* (1.96)	-0.046** (-2.44)
AdjR2	0.646	0.588	0.864	0.723	0.660	0.836
Controls	Y	Y	Y	Y	Y	Y
MStar Month FE	Y	Y	Y	Y	Y	Y
Obs	116337	116335	116337	116337	116335	116337
\bar{y} for Non-ESG	4.625	4.597	4.612	4.721	4.626	4.733
$\sigma(y)$	0.345	0.341	0.370	0.764	0.729	0.771

Table IA.2: E, S, and G Ratings Across ESG Funds

This table presents results that characterize how individual E/S/G ratings of the ESG Funds we identify differ from those of non-ESG funds, using the following regression specification:

$$\rho_{jt}^x = \alpha + \beta \mathbb{1}_{jt}^{ESG\text{-category}} + \theta' X_{jt} + \iota_{MStar\ t} + \epsilon_{jt}$$

where E/S/G ratings are not standardized; $x \in \{f+, b+, b-g\}$ characterizes one of the three portfolio rating measures: long, over-weight or under-weight; $\mathbb{1}_{jt}^{ESG\text{-category}}$ is a dummy for *ESG Funds* in the top panel, and a set of dummies for each ESG category (*Imp, Imp Act, Opp, Opp Act, Exc, Men*), in the bottom panel; X_{jt} is a vector of fund-level controls, which includes log Age, log Assets, Expenses, Turnover, Fund Flows, Fund Flow Volatility, Fund-betas with respect to Fama-French-Carhart four factors; $\iota_{MStar\ t}$ represents Morningstar category cross month fixed effects. Standard errors are clustered at the fund + month level.

	E-ratings			S-ratings			G-ratings		
	long (1)	over (2)	under (3)	long (4)	over (5)	under (6)	long (7)	over (8)	under (9)
ESG	0.100*** (3.06)	0.115*** (3.25)	0.034 (1.66)	0.115*** (5.88)	0.121*** (6.02)	-0.031*** (-3.96)	0.052*** (3.90)	0.059*** (4.21)	-0.014** (-2.12)
AdjR2	0.782	0.702	0.823	0.456	0.351	0.803	0.668	0.628	0.894
Exc	0.039 (0.45)	0.035 (0.40)	0.145*** (3.18)	0.142*** (3.57)	0.151*** (3.76)	-0.032** (-2.36)	0.008 (0.24)	0.023 (0.67)	-0.021 (-1.33)
Imp	0.222*** (3.95)	0.209*** (2.86)	0.015 (0.28)	0.272*** (6.01)	0.285*** (6.12)	-0.057** (-2.44)	0.128*** (4.46)	0.141*** (5.29)	-0.042** (-2.53)
Imp Act	0.442*** (3.55)	0.519*** (3.87)	-0.019 (-0.27)	0.131*** (2.66)	0.132** (2.55)	-0.052** (-1.99)	0.036 (0.78)	0.035 (0.70)	0.000 (0.01)
Opp	0.024 (0.70)	0.053 (1.30)	0.018 (0.76)	0.007 (0.29)	0.014 (0.54)	-0.004 (-0.35)	0.036* (1.97)	0.029 (1.53)	-0.014* (-1.75)
Opp Act	0.230*** (4.10)	0.326*** (5.78)	-0.073 (-1.25)	0.186*** (5.66)	0.173*** (5.27)	-0.057*** (-3.46)	0.102*** (3.65)	0.095*** (3.45)	0.011 (0.83)
Men	0.031 (0.68)	0.040 (0.77)	-0.035 (-1.58)	0.019 (0.80)	0.020 (0.78)	-0.027** (-2.50)	0.040** (2.57)	0.051*** (2.68)	0.017** (2.40)
AdjR2	0.783	0.703	0.823	0.462	0.358	0.804	0.669	0.629	0.894
Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y
MStar Month FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Obs	116337	116335	116337	116337	116335	116337	116337	116335	116337
\bar{y} for Non-ESG	5.344	5.221	5.418	4.317	4.295	4.267	5.131	5.155	5.063
$\sigma(y)$	1.004	0.952	0.961	0.378	0.370	0.317	0.446	0.455	0.396

Table IA.3: Weighted E, S, and G Ratings Across ESG Funds

This table presents results that characterize how individual E/S/G ratings (weighted by their importance) of the ESG Funds we identify differ from those of non-ESG funds, using the following regression specification:

$$\rho_{jt}^x = \alpha + \beta \mathbb{1}_{jt}^{ESG\text{-category}} + \theta' X_{jt} + \iota_{MStar\ t} + \epsilon_{jt}$$

where E/S/G ratings are not standardized; $x \in \{+, b+, b-\}$ characterizes one of the three portfolio rating measures: long, over-weight or under-weight; $\mathbb{1}_{jt}^{ESG\text{-category}}$ is a dummy for *ESG Funds* in the top panel, and a set of dummies for each ESG category (*Imp, Imp Act, Opp, Opp Act, Exc, Men*), in the bottom panel; X_{jt} is a vector of fund-level controls, which includes log Age, log Assets, Expenses, Turnover, Fund Flows, Fund Flow Volatility, Fund-betas with respect to Fama-French-Carhart four factors; $\iota_{MStar\ t}$ represents Morningstar category cross month fixed effects. Standard errors are clustered at the fund + month level.

	weighted E-ratings			weighted S-ratings			weighted G-ratings		
	long (1)	over (2)	under (3)	long (4)	over (5)	under (6)	long (7)	over (8)	under (9)
ESG	0.029*** (2.87)	0.031*** (2.77)	-0.010* (-1.84)	0.052*** (4.45)	0.053*** (4.32)	-0.007 (-1.28)	0.014** (2.32)	0.019*** (3.15)	0.004 (1.45)
AdjR2	0.608	0.570	0.769	0.489	0.407	0.726	0.823	0.815	0.942
Exc	0.014 (0.59)	0.009 (0.36)	0.006 (0.71)	0.047 (1.63)	0.052* (1.74)	0.005 (0.55)	0.010 (0.72)	0.020 (1.35)	0.001 (0.18)
Imp	0.029 (1.36)	0.029 (1.16)	-0.010 (-0.62)	0.137*** (4.95)	0.138*** (4.60)	-0.027 (-1.34)	0.043*** (3.44)	0.049*** (4.24)	-0.004 (-0.47)
Imp Act	0.152*** (3.87)	0.170*** (4.03)	-0.034 (-1.54)	0.044 (1.45)	0.034 (1.08)	-0.003 (-0.22)	0.021 (0.85)	0.033 (1.46)	0.001 (0.11)
Opp	0.019 (1.37)	0.022 (1.42)	-0.019*** (-2.67)	0.011 (0.87)	0.014 (1.03)	0.007 (1.04)	-0.003 (-0.33)	-0.001 (-0.14)	0.005 (1.36)
Opp Act	0.085*** (3.48)	0.099*** (3.55)	-0.056*** (-2.66)	0.070*** (4.05)	0.060*** (3.31)	-0.012 (-0.70)	0.024* (1.96)	0.029** (2.06)	0.020** (2.58)
Men	0.018 (1.51)	0.020 (1.50)	0.001 (0.09)	0.017 (1.11)	0.016 (0.98)	-0.024*** (-3.00)	0.002 (0.33)	0.008 (0.89)	0.011** (2.61)
AdjR2	0.609	0.572	0.769	0.492	0.409	0.726	0.824	0.816	0.942
Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y
MStar Month FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Obs	116337	116335	116337	116337	116335	116337	116337	116335	116337
\bar{y} for Non-ESG	1.106	1.108	1.251	1.909	1.89	1.78	1.612	1.602	1.581
$\sigma(y)$	0.265	0.28	0.233	0.257	0.256	0.212	0.29	0.304	0.271