

Sustainability or Performance? Ratings and Fund Managers’ Incentives

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Abstract

We explore how mutual funds react when the tradeoff between sustainability and performance becomes salient. Following the introduction of Morningstar's sustainability ratings (the "globe" ratings), mutual funds increased their holdings of sustainable stocks in order to improve their globe ratings. This trading behavior created buying pressure, decreasing the returns of stocks with high sustainability ratings. Consequently, a tradeoff between sustainability and performance emerged. Since performance appears to be more important in attracting flows than sustainability, in the new equilibrium, funds do not trade to improve their globe ratings and the globe ratings do not affect investor flows.

Keywords: Sustainability, ESG, Mutual Funds, Fund Flows, Ratings

JEL Classifications: G11, G12, G23, G24

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We explore how mutual funds react when the tradeoff between sustainability and performance becomes salient. Following the introduction of Morningstar's sustainability ratings (the "globe" ratings), mutual funds increased their holdings of sustainable stocks in order to improve their globe ratings. This trading behavior created buying pressure, decreasing the returns of stocks with high sustainability ratings. Consequently, a tradeoff between sustainability and performance emerged. Since performance appears to be more important in attracting flows than sustainability, in the new equilibrium, funds do not trade to improve their globe ratings and the globe ratings do not affect investor flows.

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In their efforts to increase financial flows to sustainable investments, policymakers often advocate higher transparency about the sustainability of mutual fund portfolios. To this end, in March 2016, Morningstar introduced the globe ratings to rank the sustainability of funds' portfolios. Hartzmark and Sussman (2019) show that in the aftermath of their introduction, these easy-to-process and attention-grabbing signals significantly increased flows to the funds that received the highest sustainability ratings; in contrast, the funds with the lowest ratings experienced outflows.¹

This paper asks whether portfolio sustainability ratings can have long-lasting effects on the allocation of capital in a world in which funds compete for flows based not only on their portfolios' sustainability, but also on performance. This concern arises from the fact that precisely because they affect flows, portfolio ratings alter stock demand. In particular, we expect funds to take into consideration the stocks' sustainability ratings to a larger extent after the introduction of the Morningstar globe ratings because a higher portfolio sustainability rating can positively impact flows. This behavior could improve the funds' performance if sustainability is positively related to the stocks' future returns and most market participants do not take it into account (Pedersen, Fitzgibbons, and Pomorski, 2019).

However, attempting to improve their globe ratings, mutual funds may increase their demand for stocks with high sustainability ratings above and beyond what would be warranted by the stocks' expected returns. The demand pressure they create is likely to increase the valuation of stocks with high sustainability ratings and negatively affect their future returns (Heinkel, Kraus,

¹ Ammann, Bauer, Fischer, and Müller (2019) and Ceccarelli, Ramelli, and Wagner (2020) also show that flows to funds with high sustainability ratings increase in the aftermath of the ratings' introduction.

and Zechner, 2001; Pastor, Stambaugh, and Taylor, 2021; Pedersen, Fitzgibbons, and Pomorski, 2019). Under these conditions, a tradeoff may arise between the rankings of a fund's portfolio along the sustainability and the performance dimensions. Even in sustainable funds, managerial compensation depends on assets under management and performance (Geczy et al., 2021). Therefore, the relative weights that mutual funds' investors in the aggregate put on performance versus sustainability are likely to affect fund managers' incentives to pursue different objectives. If fund managers expect to attract enough flows by obtaining top sustainability ratings, an equilibrium may arise in which some funds pursue higher sustainability, while others aim for better performance. However, if most investors primarily value performance and strong performance leads to larger flows, the tradeoff between sustainability and performance may motivate all funds to pursue performance as their main objective. In this case, the globe ratings may have limited effects on the funds' portfolio allocation.

Exploiting the introduction of the globe ratings, we investigate how the US mutual fund industry transitions to a new equilibrium and whether the sustainability ratings affect the funds' allocation of capital. We show that after the introduction of the globe ratings, mutual funds with stronger incentives to achieve higher globe ratings changed their investment policies to improve the sustainability rankings of their portfolios. This generated buying (selling) pressure and stocks with high (low) sustainability ratings subsequently underperformed (overperformed) as a result of the mutual funds' trading behavior. The trading pressure created by sustainability-driven funds appears only temporary as there is no evidence that trading against globe-improving funds generates positive returns in the long-term. Importantly, we show that these patterns are unrelated to shifts in sustainability concerns stemming from the changes in the US administration.

Funds that were attempting to improve their star ratings, another popular Morningstar metric that ranks mutual funds on performance, purchased (sold) stocks that subsequently overperformed (underperformed) because of the transitory trading pressure from funds pursuing better sustainability ratings. This behavior was more pronounced for funds with stronger incentives to improve their star ratings, for instance because they were closer to the cutoff for a higher rating and competed with fewer peers to be upgraded. As a consequence, funds improving their globe ratings underperformed and were more likely to experience a downgrade of their star ratings. In contrast, funds purchasing (selling) stocks with low (high) sustainability ratings, which were sold (bought) by the funds attempting to improve their globe ratings, achieved better performance and improved their star ratings.

We show that in the aftermath of the introduction of the globe ratings, both high (low) globe and star ratings have positive (negative) effects on flows. This is unsurprising because the performance of funds with initially more sustainable portfolios benefits from the increased demand for stocks with high sustainability scores (Pastor, Stambaugh, and Taylor, 2021b). Even though the performance and sustainability ratings were congruent in the initial period, star ratings appear to have larger effects on flows. More importantly, we find that the effect of the globe ratings on flows is not persistent. In particular, starting nine months after the introduction of the globe ratings, we do not observe any effects of these ratings, and their changes, on flows. Consistent with a new equilibrium in which globe ratings no longer affect flows, funds nearly stop trading in order to improve their globe ratings.

We consider several alternative explanations. For instance, flows to funds with sustainable portfolios may be sticky and may not change after the initial allocation. However, we show that there is considerable turnover in globe ratings during the whole sample period, but only star

ratings' upgrades and downgrades are associated with fund flows, indicating that in the long-term, globe ratings fail to spur reallocation of capital to sustainable investment in the US mutual fund industry. In addition, we show that Morningstar's November 2018 change in criteria for assigning the globe ratings did not increase the relevance of the sustainability ratings for fund flows.

Taken together, our results suggest that fund managers became aware of the tradeoff between sustainability and performance and chose to pursue performance, which consistently leads to higher flows, and is therefore better aligned with the managers' compensation structure. At the same time, mutual fund investors, and especially institutions that may have chosen high sustainability-rated funds to signal their own ESG credentials to clients, appear to have realized that globe rating upgrades were associated with poorer performance and stopped pursuing high sustainability ratings.

This paper contributes to a growing literature that explores how sustainability affects investors' strategies and performance. Socially responsible investors are generally believed to put sustainability before performance (Riedl and Smeets, 2017; Barber, Morse, and Yasuda, 2021; Bauer, Ruof, and Smeets, 2021). Arguably for this reason, socially responsible mutual funds have been shown to have a lower flow-performance sensitivity (Bollen, 2007; Pastor and Vorsatz, 2020). However, there is no consensus on whether ESG investment is positively or negatively associated with performance, with a number of studies highlighting that sustainability improves performance and limits downside risk (see, e.g., Edmans, 2011; Lins, Servaes, and Tamayo, 2017; and Albuquerque, Koskinen, and Zhang, 2019).² It is, therefore, important to examine a context in which the tradeoff between sustainability and performance is salient, as we do in this paper.

² Confusion about the effects of ESG on financial performance is also frequently discussed in the press. See "ESG outperformance narrative 'is flawed', new research shows", *Financial Times*, May 3, 2021, available at <https://www.ft.com/content/be140b1b-2249-4dd9-859c-3f8f12ce6036>.

Considering investment products without an explicit sustainability focus, we show that too few US mutual fund investors value sustainability over performance to generate any long-term effects of the globe ratings on the allocation of capital.

Another strand of the mutual fund literature studies how investor flows respond to attention-grabbing and easy-to-process signals, such as external rankings of the funds' performance (see, e.g., Del Guercio and Tkac, 2008; Evans and Sun, 2021; Ben-David, Li, Rossi, and Song, 2019; Kim, 2021; Reuter and Zitzewitz, 2021) or of the sustainability of the funds' portfolios (Hartzmark and Sussman, 2019; Ammann, Bauer, Fischer and Müller, 2019). Specifically, we build on the work of Hartzmark and Sussman (2019) who investigate the effects of the globe ratings on fund flows in a narrow time frame after the ratings' introduction, largely abstracting from general equilibrium implications. We highlight that the globe ratings caused temporary trading pressure, thus affecting stock prices and fund performance.

Prior work has shown that fund managers' pursuit of better star ratings affects stock demand and prices (Han, Roussanov, and Ruan, 2021; Kim, 2021). However, we are the first to highlight the tensions arising when funds are rated along two different dimensions that may create opposing incentives for fund managers. We show that in the long run, only ratings on the dimension that is followed by a larger proportion of investors matter.

In this respect, our paper also adds to a vast literature, mostly developed in the debt markets, on the consequences of ratings. Existing literature shows that corporations and financial intermediaries have strong incentives to improve and manipulate their ratings (e.g., Rajan, Seru, and Vig, 2015; Kisgen, 2006). We study how mutual funds strive to obtain higher performance and sustainability ratings and how the incentives arising from fund flows may make some ratings irrelevant in the presence of tradeoffs between different types of ratings.

Finally, our paper is related to a strand of the literature exploring the consequences of investors' preferences for sustainable investments on asset prices. For instance, Chava (2014) and Bolton and Kacperczyk (2020) show that high carbon emissions result in high stock returns because of institutional investors' preferences against stocks with these characteristics. Some of these effects on stock prices, however, appear to be related to temporary demand pressure and not to be persistent (Pastor, Stambaugh, and Taylor, 2021b). We exploit the introduction of the globe ratings as an exogenous shock to mutual funds' trading behavior, affecting the valuation of stocks with different sustainability ratings. We also show how funds react to such a shock in order to increase their assets under management.

1. Institutional Background

1.1 Morningstar Performance Ratings

The Morningstar star ratings were first introduced in 1985 and represent a quantitative backward-looking measure of a fund's performance, ranging from one (low) to five (high) stars. The star rating is based on a fund's percentile rank relative to peer funds in the same Morningstar style category. Thus, systematic differences in performance between mutual funds with different investment styles (e.g., growth vs. value) do not affect the star ratings.

The fund's performance is measured using Morningstar's Risk-Adjusted Return. Morningstar computes ratings based on the fund's three-, five-, and ten-year performance. The overall Morningstar rating is based on a weighted average of all available time-period ratings. A fund must have been active and reported performance for at least 36 months to obtain a star rating.³

³ An overview of the Morningstar star ratings and the detailed procedures used in calculating them is available at https://www.morningstar.com/content/dam/marketing/shared/research/methodology/771945_Morningstar_Rating_f_or_Funds_Methodology.pdf.

Star ratings are updated at the end of every month and have been shown to be an important determinant of fund flows, above and beyond the funds' historical performance (Evans and Sun, 2021; Ben-David, Li, Rossi, and Song, 2019; Del Guercio and Tkac, 2008). Fund managers' investment policies are also believed to be influenced by the pursuit of higher star ratings (Han, Roussanov, and Ruan, 2021; Kim, 2021).

As easy-to-process and attention-grabbing signals, star ratings appeal to do-it-yourself retail investors as well as to the clients of financial advisors and trustees responsible for choosing the menu of funds for 401(k) plans. Because institutional investor classes frequently include accounts for which individuals hold the beneficial ownership interest (Gallagher, Schmidt, Timmermann, and Wermers, 2020), star ratings have an effect on both retail and institutional flows.

1.2 Morningstar Sustainability Ratings

On March 1, 2016, Morningstar introduced ratings aimed at ranking the sustainability of the funds' portfolios. The objective was to provide a way for investors to evaluate how different funds meet environmental, social, and governance standards. These ratings were introduced side-by-side with the star ratings and are referred to as the globe ratings. They range from one (low) to five (high) globes.⁴

The globe ratings are based on a fund's portfolio sustainability score, which has always been available to Morningstar users. It is computed as a weighted average of the company-level ESG scores, obtained from Sustainalytics, with the fund's portfolio shares as weights. A fund's

⁴ Most of our tests focus on the period following the initial introduction of Morningstar's globe ratings. In late 2018, Morningstar changed the methodology to compute the ratings by considering the sustainability of a fund's portfolio in the past and switching the peer-fund group from the Morningstar category to the more comprehensive Morningstar Global category. We show that these changes do not affect our conclusions.

globe rating is based on the percentile rank of its portfolio sustainability score relative to other funds in the same Morningstar style category; thus, systematic differences in the investment opportunities' ESG scores of funds with different specialization (e.g., growth vs value) do not affect the globe ratings. Only funds belonging to categories with at least ten funds are ranked. Table A.1 summarizes how the star and globe ratings relate to the funds' percentile ranks.

There is no evidence that the introduction of the globe ratings, or their methodology, was known to fund managers or investors before their introduction in March 2016. Accordingly, both institutional and retail flows increase (decrease) for funds with the top (bottom) globe rating only after March 2016 (Hartzmark and Sussman, 2019). As attention-grabbing signals about the sustainability of a fund's portfolio, globe ratings are expected to appeal to both retail and institutional mutual fund investors. In particular, using the globe ratings, institutions could easily communicate the sustainability of their asset holdings to their clients.

2. Data and Descriptive Statistics

Our sample includes all U.S. equity funds domiciled in the U.S., which have both star and globe ratings. As is common in the literature (Chevalier and Ellison, 1997), we include funds that are more than two years old and have at least \$10 million in assets under management. We also require funds to have information about their returns, age, expense ratio, TNA, and Morningstar category. Our main sample period ranges between March 2016 and December 2017 and includes 1,953 unique funds.⁵ We perform robustness tests on the more recent periods, which we introduce later in the paper.

⁵ The funds belong to the following Morningstar categories, within which they are sorted to obtain the globe ratings: US Fund Large Blend; US Fund Large Growth; US Fund Large Value; US Fund Mid-Cap Blend; US Fund Mid-Cap Growth; US Fund Mid-Cap Value; US Fund Small Blend; US Fund Small Growth; US Fund Small Value. Only 30 funds in our sample market themselves as ESG funds, based on whether their names include terms such as ESG,

For each fund, we aggregate fund size (TNA) and flows across share classes and calculate the fund's mean expense ratio and returns. We use the star rating of the largest share class and compute the fund's age as the time from inception of the oldest share class.

Table 1 summarizes the main variables. Detailed variable definitions are in the Appendix.

3. Results

3.1 The Introduction of the Sustainability Ratings and Funds' Incentives

We explore how the introduction of the sustainability ratings affects funds' trading behavior. Fund managers should have incentives to improve their funds' globe ratings if they expect better globe ratings to increase assets under management. Funds close to the rating cutoffs should have stronger incentives to rebalance their portfolios because they are more likely to achieve a better rating or equivalently to avoid a downgrade. Similar incentives have been shown to be at work for corporations that attempt to manipulate their credit ratings by changing their capital structure (Kisgen, 2006).

Hartzmark and Sussman (2019) show that only funds with the highest (lowest) globe rating experience inflows (outflows). Hence, fund managers close to the cutoffs for the bottom and top ratings should have stronger incentives to improve their globe ratings or to avoid being downgraded. Their trading, in turn, may create transitory buying (selling) pressure in stocks with high (low) ESG scores.

sustainable, socially-responsible, etc. Nearly 40% of these ESG-branded funds have the top globe rating, with the rest being distributed across the lower globe ratings.

To evaluate how the globe ratings affect fund managers' incentives, Table 2 studies a quarterly fund-stock-level panel. The dependent variable is the change in the position of fund f in stock i in quarter t , defined as:

$$Position\ Change(f, i, t) = \frac{Price(i, t-1) * [NumShares(f, i, t) - NumShares(f, i, t-1)]}{TNA(f, t-1)}.$$

We normalize fund f 's change in the holdings of stock i by the fund's TNA at the beginning of the quarter. We conjecture that funds with sustainability ratings within $\pm 2.5\%$ of the sustainability score cutoff between globes 1 and 2 or between globes 4 and 5 have stronger incentives to try to improve or maintain their globe ratings. We label these funds *Border Funds*. We control for stock characteristics and interactions of fund and time fixed effects, which capture the propensity of different funds to trade in a given quarter.

Table 2 shows that funds with strong incentives to improve or maintain their globe ratings indeed increase their holdings of stocks with high ESG ratings, as captured by the stocks' Sustainability *Effective ESG Score*. For example, in column (2), an interquartile-range increase in a stock's effective ESG score is associated with a 0.52% increase in the position of funds with sustainability ratings close to the cutoffs. This increase is about 6.5 times the average position change.⁶ In column (4), the border funds that compete with fewer peers, and are thus more likely to be upgraded, exhibit an even larger propensity to increase their positions in stocks with high ESG scores.

Importantly, this effect is driven by the first nine months after the introduction of the globe ratings. Funds' incentives to improve their sustainability scores appear to have subsequently weakened, as seen in column (3). As we show below, this is consistent with a new equilibrium in

⁶ The economic magnitude is computed as $0.047 * (51.149 - 40.103)$, where 51.159 is the 75th percentile of the ESG score, 40.103 is the 25th percentile, and the average change in position is 0.079.

which the globe ratings are no longer associated with flows, presumably because fund managers and investors became aware of the tradeoff between sustainability and performance.

We also consider that our sample includes index funds, whose holdings must reflect the indexes they follow. Because of their mandates, index funds have to increase their holdings in index constituents that appreciate without any strategic considerations. This could bias our estimates. We thus split our sample of funds using the corresponding Morningstar flag. Reassuringly, column (6) shows that actively-managed border funds increase their purchases of stocks with high *Effective ESG Score* during the first nine months after the introduction of the globe ratings. We do not find any effect for index funds (column (7)), which supports our interpretation that active border funds trade strategically to increase the sustainability of their portfolios.

3.2 Stock-level Consequences

To measure the aggregate purchases of funds aiming to obtain higher sustainability ratings, we contrast their trading to the trading of other funds that do not improve their globe ratings. We do so, instead of merely considering the stocks' sustainability ratings, because funds pursue different strategies and may select stocks within their mandates that can inadvertently contribute to improving their globe ratings.

Specifically, we define the aggregate abnormal ESG trading experienced by stock i in quarter t as:

$$Agg\ Abnormal\ ESG\ Trading(i, t) = \sum_{f=1}^F Abnormal\ Trading(f, i, t), \text{ if } f \in G,$$

where G is the set of funds that improve their globe ratings between quarters $t-1$ and t . The abnormal trading of fund f in stock i between quarters $t-1$ and t is equal to the change in the fund's

number of shares in stock i as a fraction of the stock's shares outstanding – $Trading(f, i, t) = \frac{NumShares(f, i, t) - NumShares(f, i, t-1)}{Shares\ Outstanding(i, t-1)}$ – minus the average change between $t-1$ and t in the holdings of stock i by all other funds in our sample.

According to our definition, *Agg Abnormal ESG Trading* $(i, t) > 0$ indicates that during quarter t , there is buying pressure in stock i , created by the funds that end up improving their portfolio sustainability ratings. In contrast, *Agg Abnormal ESG Trading* $(i, t) < 0$ implies that there is selling pressure created by the funds that improve their globe ratings.

While this definition of trading pressure is based on the ex-post realization of the funds' globe ratings, our results are similar if we use an ex-ante definition of trading pressure that takes into account the incentives of border funds. Specifically, in our ex-ante definition, we consider the aggregate buying and selling pressure generated by the funds with stronger incentives to improve their globe ratings, defined as funds in a $\pm 2.5\%$ neighborhood of the portfolio sustainability score cutoffs for the bottom and top globe ratings.

Table 3 shows that according to our ex-post (ex-ante) definition, the trading of the funds that (have stronger incentives to) improve their sustainability ratings is statistically different from the trading of the average mutual fund in our sample. This suggests that funds may be actively changing their portfolios in order to improve their globe ratings. For example, based on the ex-post definition of aggregate trading pressure (top panel), the average abnormal ESG trading in stock i is about 9.8% of the average total trading of mutual funds during the 18-month sample period (column (1)).⁷ This large magnitude could potentially affect stock prices.

⁷ This economic magnitude is calculated as the coefficient in column (1) (0.0000858), divided by the average total trading of mutual funds as a percent of shares outstanding (0.000874).

Importantly, this pattern is driven by the first nine months after the introduction of the portfolio sustainability ratings, as seen in column (2). In the second half of the sample, the trading of the funds that end up improving their ratings, as well as the trading of the funds that are close to the ratings' cutoffs, is not statistically different from the average trading of the other mutual funds in the sample (column (3)). This is consistent with our findings in Table 2 that after the initial period, funds stop targeting improvements in their sustainability ratings.

To provide more direct evidence that the abnormal trading of funds that obtain better globe ratings is indeed driven by their efforts to improve the sustainability of their portfolios, we explore whether the sign of the aggregate ESG trading pressure experienced by a given stock is positively related with the stock's ESG score. Figure 1 provides graphical evidence that this is indeed the case. A higher stock ESG rating is associated with higher abnormal trading by funds that end up improving their globe ratings, but this pattern is much more pronounced in the first half of the sample period and largely absent in the second half.

Table 4 presents similar results controlling for a number of stock characteristics. The specifications also include interactions of the 42 Sustainalytics industries and time fixed effects. These high-dimensional fixed effects control for shocks to firms in different industries, which may affect funds' demand, including, for instance, the popularity of value and growth strategies that may drive flows to different segments of the mutual fund industry.

We find that the effect of a stock's *Effective ESG Score* on the aggregate *Abnormal ESG Trading* is highly economically significant; for instance, in column (2), a one-standard-deviation increase in a stock's ESG score (=8.6) explains about 42.4% of the mutual funds' total abnormal trading in the stock, calculated as $(0.431 \times 8.6) / (0.000874 \times 10000)$. Importantly, consistent with our earlier findings in Table 2, this pattern emerges only in the first nine months after the introduction

of the globe ratings. We fail to detect a significant relation between the stocks' ESG scores and the funds' abnormal ESG trading afterwards.

We next explore whether the demand by the funds that strive to improve their sustainability ratings affects stock returns, thus creating profitable trading opportunities for other funds. If the sustainability-driven funds create transitory demand pressure, we should observe that the stocks that they purchase to a larger extent than other funds subsequently underperform, while the opposite should be the case for the stocks that they sell.

To evaluate this conjecture, we consider the returns on a zero-cost long-short strategy that goes long in stocks with ESG selling pressure and short in stocks with ESG buying pressure. The portfolio is rebalanced at the beginning of each quarter based on the aggregate abnormal ESG trading pressure during the previous quarter. Since we need the abnormal trading pressure generated by the introduction of the globe ratings to create the portfolios, we lose the first quarter of the sample period. We estimate the Jensen's alpha of this long-short portfolio, controlling for the three Fama-French factors and the momentum factor.

Table 5 shows that such a strategy has a positive and statistically significant alpha in the first six months following the introduction of the globe ratings. This is the case regardless of whether we use equally-weighted or value-weighted returns. The annualized return of the strategy is 10.8% ($=0.043 \times 252$), when considering equally-weighted portfolios (column (1)). The return is slightly lower (5.3%) and only marginally significant in the case of value-weighted portfolios (column (3)), arguably because large stocks are less affected by the trading pressure.

One may wonder whether the profitability of the long-short portfolio is driven by the outcome of the 2016 presidential election, when Donald Trump (unexpectedly) won and the prices

of oil and coal firms soared.⁸ This, and not the trading pressure generated by funds attempting to improve their globe ratings, could potentially drive our results because oil and coal companies tend to have lower ESG scores and could have experienced price appreciation in November 2016. To address this concern, Table A.4 in the Appendix shows that our results are qualitatively invariant and quantitatively larger if we exclude November and December 2016. This is consistent with our conjecture that the globe ratings affected fund managers' trading only in the immediate aftermath of their introduction.

Thus, the return of the long-short strategy appears to decline over time as selling stocks experiencing high ESG buying pressure becomes no longer profitable. The decrease in returns is consistent with lower demand (supply) pressure in stocks with high (low) ESG scores created by the funds that aim to improve their globe ratings during the second half of the sample.

Overall, the evidence in Table 5 suggests that in the aftermath of the introduction of the globe ratings, the trading of the funds that tried to improve their sustainability ratings provided trading opportunities for other funds that were not as concerned about the sustainability of their portfolios but aimed instead to improve their performance.

3.3 Performance-driven Fund Trading Strategies

We evaluate whether fund managers that do not pursue higher sustainability ratings exploit the trading of ESG-driven funds. We consider only funds that do not end up improving their globe ratings. We then investigate whether these funds take the opposite trading position and whether they benefit from the price pressure generated by the sustainability-driven funds.

⁸ See "Oil, Coal Seen as Winners With Donald Trump Victory", *Wall Street Journal*, November 9, 2016.

It is important to note that the answer to this question is far from obvious. Other mutual funds may wish not to impair their sustainability scores. Thus, the counterparty to the funds that aim to improve their globe ratings may be other institutional or retail investors whose portfolios we do not observe.

Our empirical specifications test whether there is a contemporaneous relationship between the sales of mutual funds that improve their globe ratings and the purchases of other funds with incentives to improve their performance. In this way, we implicitly assume that fund managers learn about the trading pressure generated by ESG-driven funds from their brokers who extrapolate the informational content in the order flow and allow their clients to anticipate future price behavior. Such an assumption is consistent with prior evidence that brokers disseminate information about profitable trading opportunities to their clients with the objective of generating broker fees (Di Maggio, Franzoni, Kermani, and Sommarvilla, 2019; Barbon, Di Maggio, Franzoni, and Landier, 2019).

Panel A of Table 6 shows that in the first nine months following the introduction of the globe ratings, that is, when this trading strategy appears relatively more profitable, other fund managers take the opposite position of sustainability-driven funds. The economic magnitude of the funds' position change is meaningful and equals -0.25% of the funds' TNA, calculated as the coefficient in column (2), multiplied by the standard deviation of the *Abnormal ESG Trading* variable (-0.591×0.0043).

This result is obtained including interactions of fund and time fixed effects in all specifications to control for shocks to a fund's net assets under management. Importantly, the fact that the results do not hold in the second part of the sample suggests that the findings are not hard-

wired by the definition of *Abnormal ESG Trading*, which captures the abnormal trading of globe-improving mutual funds, relative to the remaining funds whose trading we explore in Table 6.

In columns (5) and (6), we compare the trading of actively-managed funds and index funds. Once again, our results should be driven by active funds if we are indeed capturing fund managers' strategic behavior. Consistent with our conjecture, we find that the tendency to trade against ESG-motivated funds in the first nine months after the introduction of the globe ratings is more pronounced when we exclude index funds in column (6), indicating that the strategic behavior of active funds drives our estimates. In column (5), the effect is statistically insignificant for index funds.

To further support our interpretation of the empirical evidence, the rest of Table 6 investigates whether funds that have stronger incentives to improve their performance and to increase their star ratings are more likely to buy stocks that are experiencing trading pressure due to their ESG scores. In particular, funds close to the star rating cutoffs have a high probability to be upgraded or to avoid a downgrade by trading strategically and have strong incentives to do so because better star ratings are known to lead to larger flows, above and beyond the direct effect of the funds' performance (Del Guercio and Tkac, 2008). Therefore, funds in the neighborhood of the star rating cutoffs may be more inclined to disregard their sustainability scores. We consider all star ratings because higher star ratings have been shown to be positively associated with larger fund flows (Del Guercio and Tkac, 2008).

Consistent with our conjecture, Panel B shows that funds that are closer to the star rating cutoffs take larger positions in stocks with negative aggregate ESG trading pressure. The effect increases monotonically, as we consider funds further away from their rating cutoff (column (1)), funds that are within $\pm 5\%$ of the percentile ranking cutoff (column (3)), and funds that are within

$\pm 2.5\%$ of this cutoff (column (5)). Once again, the effect is driven by the first nine months after the introduction of the globe ratings, as indicated by the negative and significant coefficients on *Abnormal ESG Trading* only in the odd-numbered columns.

Panel C further explores to what extent the incentives to trade against funds pursuing higher globe ratings are driven by the desire to improve the funds' star ratings. Because funds are ranked relative to their Morningstar category peers and different categories have different numbers of funds, the number of peers within a particular category significantly affects funds' ability to obtain higher star ratings. Since improving the ratings should be easier for funds with fewer peers, we should observe that *ceteris paribus*, funds with fewer peers take larger positions against the aggregate ESG pressure. This is indeed what the economic magnitudes and statistical significance of the interaction coefficients in columns (3) and (5) suggest. Funds with more peers, being less likely to succeed in improving their ranking in order to obtain a better star rating, exhibit a lower propensity to exploit the aggregate ESG pressure. In addition, comparing odd-numbered and even-numbered columns, we see that the effects are stronger in the first nine months after the introduction of the globe ratings.

Finally, Table 7 shows that our results are robust if we consider the ex-ante proxy for abnormal ESG trading pressure and restrict the sample to funds that have stronger incentives to improve their star ratings because they are closer to the rating cutoffs.

3.4 Tradeoff between Sustainability and Performance

In this subsection, we consider the consequences of the funds' trading strategies on their star ratings and performance. To do so, we need a proxy for the extent to which a fund has been trading to pursue an improvement in its globe rating. Thus, for each fund, we add up the value of

the position changes in stocks that we have identified as more likely to have experienced high aggregate ESG trading pressure. In particular, we define:

$$ESG\ Pressure\ Trading\ (f, t) = \sum_{i=1}^N Pressure\ Trade\ (f, i, t),$$

where *Pressure Trade* (f, i, t) equals the absolute value of fund f 's *Position Change* (f, i, t) if (1) stock i experiences abnormal ESG trading pressure in the top quintile ($Agg\ Abnormal\ ESG\ Trading\ (i, t) \in Top\ Quintile$) and fund f increases its portfolio share in stock i ($Position\ Change(f, i, t) > 0$), or if (2) stock i experiences abnormal ESG trading pressure in the bottom quintile ($Agg\ Abnormal\ ESG\ Trading\ (i, t) \in Bottom\ Quintile$) and fund f decreases its portfolio share in stock i ($Position\ Change(f, i, t) < 0$).

Large positive values of *ESG Pressure Trading* indicate that a fund has been trying to improve its sustainability score, while negative values of this variable suggest that the fund has been taking the opposite trading strategy. By construction, funds that trade stocks with aggregate abnormal ESG trading pressure should have a higher likelihood of improving their globe ratings. More interestingly, we explore how pursuing a strategy that aims to improve the fund's sustainability rating affects its performance.

Panel A of Table 8 shows that funds that tilt their portfolios towards stocks that are experiencing higher aggregate abnormal ESG pressure are more likely to see a positive change of their globe ratings (column (1)). Notably, these funds are also more likely to experience a downgrade of their star ratings (column (3)), indicating that there is a tradeoff between sustainability and performance ratings. Equivalently, funds that trade against sustainability-driven aggregate abnormal ESG pressure tend to improve their performance ratings, but at the expense of a downgrade of their sustainability ratings.

This tradeoff between sustainability and performance emerges in the first nine months after the introduction of the globe ratings, when the stocks with aggregate abnormal ESG pressure underperform, but is not present afterwards, as seen in column (4).

In Panel B of Table 8, the funds' performance reveals a similar pattern. In particular, we regress a fund's alpha, estimated as the fund's abnormal return in excess of its exposure to the three Fama-French factors and the Carhart's momentum factor, on *ESG Pressure Trading* (f, t) and a number of controls, including interactions of the fund style category and time fixed effects. It is evident that in the first nine months after the introduction of the globe ratings, funds that trade against the pressure generated by ESG-motivated trades enjoy better performance. The effect is not only statistically but also economically significant; a one-standard-deviation increase in *ESG Pressure Trading* is associated with an increase in a fund's alpha by 0.092%, equivalent to a 69.7% increase for a fund with an average alpha. We find no significant effects in the subsequent period when funds' propensity to pursue ESG-driven trades subsides (column (3)).

4. Consequences for Fund Flows

4.1 Main Findings

In this section, we explore why funds' incentives change after the first few months immediately following the introduction of the globe ratings. Fund managers' compensation depends on the fees they earn, which in turn are driven by the funds' net assets under management (Chevalier and Ellison, 1997; Ma, Tang, and Gomez, 2019). Based on these considerations, a fund's trading strategy should aim to maximize net flows, which are known to be affected by the fund's performance as well as by its sustainability and performance ratings.

If some investors value sustainability over performance in their fund selection, there might exist an equilibrium in which some funds pursue better sustainability ratings while other funds strive for better performance ratings.

Table 9 explores to what extent this is the case. We find that during our sample period, only the funds' star ratings consistently bring more flows. Such a finding emerges in Panel A, where we estimate specifications similar to those in Hartzmark and Sussman (2019), controlling for the funds' prior-month categorical star ratings. We confirm these results in Panel B, where we instead include dichotomous variables for each of the lagged star ratings, using the middle globe/star ratings as the omitted variables.

As is evident from columns (2) and (5) of Panels A and B, in the first nine months of the sample period, funds with the top globe rating experienced higher inflows, while those with the bottom rating suffered outflows. However, a comparison of the coefficients on the globe and star ratings shows that the star ratings have larger effects on flows than the corresponding globe ratings. Thus, pursuing a better globe rating may be counterproductive if associated with a downgrade of the performance rating because collectively investors appear to care more about performance. For example, in column (2) of Panel B, having a globe rating of 5 increases fund flows by 0.3%, whereas having a star rating of 1 reduces flows by 1.1%. In contrast, having a globe rating of 1 decreases flows by 0.4%, but a star rating of 5 increases flows by 2.5%.

Nevertheless, it could be that a top globe rating insulates funds from redemptions following weak performance (Bollen, 2007). In turn, this could give poorly-performing asset managers incentives to invest in sustainable stocks. In Table A.3 in the Appendix, we show that a top globe rating does not mitigate the negative effects of weak performance. The interactions between globe and star ratings are not statistically significant. In particular, funds that obtain a top globe rating

do not experience smaller outflows when they have low performance ratings or weak performance. This suggests that fund managers have stronger incentives to pursue high performance ratings than high sustainability ratings. Such an interpretation is consistent with the evidence that fund managers stop trading to increase their sustainability ratings in the second half of the sample period, when presumably they became aware of the tradeoff between sustainability and performance and its consequences on flows.

Interestingly, the globe ratings appear to leave flows unaffected in the second half of the sample period and have weaker effects when we consider the full sample period. The findings are broadly confirmed in Panel C, where we distinguish between funds' institutional and retail share classes. While immediately after the introduction of the globe ratings institutional investors allocate capital to funds with the top globe rating (column (2)) and retail investors redeem capital from funds with the bottom globe rating (column (5)), the sustainability ratings lose power in explaining the flows for both categories of investors in the second half of the sample.

Consistent with evidence that mutual fund investors pay close attention to star ratings and their upgrades and downgrades, it appears that the star rating downgrades of the funds that achieved the highest sustainability ratings led investors to subsequently ignore the globe ratings. This effect is likely to have been stronger for institutional share classes as these more sophisticated institutional investors realized that a top globe rating was not a costless marketing tool, but instead came at the expense of lower performance. Thus, because of the tradeoff between performance and sustainability, most investors ended up only focusing on performance. In turn, this made the globe ratings irrelevant and further weakened fund managers' incentives to improve their funds' sustainability ratings in the second half of the sample.

4.2 Alternative Explanations

One reason why the globe ratings lose power in attracting flows could be that all investors that wanted to hold sustainable mutual funds quickly reallocated their portfolios in the immediate aftermath of the introduction of the globe ratings. If the globe ratings are rarely changed once they are assigned, investors would not need to switch funds, and hence, we would observe little effect on flows. Such findings would be consistent with an equilibrium in which both sustainability and performance matter for different investors depending on their preferences.

However, Table A.2 shows that the turnover in both globe and star ratings is only slightly lower in the second half of the sample period. If anything, upgrades/downgrades to/from the top and bottom globe ratings, which are the ones that matter for flows in the first part of the sample, become more common in the second subperiod. Thus, funds that achieve an improvement in their globe ratings should experience net inflows if a sufficiently large proportion of investors care more about sustainability than performance; the contrary should be true for funds whose globe ratings are downgraded.

In Table 10, we consider the reaction of flows to globe rating upgrades and downgrades, controlling for the initial rating. We find no evidence that investors respond to upgrades and downgrades from/to the bottom and top globe ratings in the second part of the sample. Only star ratings appear to matter. These findings support our interpretation that flows stop responding to the globe ratings after their initial disclosure, arguably because investors become aware of the tradeoff with performance. Put differently, even if the assets under management of funds with the top sustainability ratings increased after the introduction of the ratings, changes in the sustainability of the funds' portfolios captured by rating upgrades and downgrades do not lead

investors to reallocate capital. This suggest that in the long-term, the globe ratings are unlikely to lead to an increase in financial flows to sustainable investments.

Another possibility is that investors consider the funds' sustainability scores as opposed to their globe ratings. The sustainability scores have the advantage to give an absolute ranking of the sustainability of the funds' portfolios, rather than relative to other funds in the same category, and may therefore be preferred by investors with pro-social preferences. In this case, the sustainability of a fund's portfolio could attract flows, even if the globe ratings stop being relevant. To evaluate this possibility, in Table 11, we substitute the fund's globe rating with its sustainability score. Consistent with our earlier findings, the sustainability score appears to be positively related to flows only in the first half of the sample period, confirming that only the fund's performance matters for flows in the long-term.

This finding is also important for another reason. During the second half of our sample period, the Trump administration had taken over. The change in administration and the announcement of the US withdrawal from the Paris climate agreement in June 2017 could have weakened any risks of regulatory interventions that lead companies to improve their environmental policies. In turn, this could explain the changes in expected stock returns, even though this seems unlikely because ESG ratings are distinct from climate risk and have been shown to be unrelated to stocks' risk-return profiles (Chava, Kim, and Lee, 2021). In addition, we find differences in stock returns only in the period before Trump's unexpected election. If the changes in stock returns and fund performance we observe in the second half of the sample were driven by a change in regulatory risk, we should still observe that some investors continue to care about sustainability and respond to the changes in sustainability ratings. Instead, we find that flows are only responsive to the funds' performance ratings.

5. Robustness

In October 2018, Morningstar announced some changes to the criteria used to assign globe ratings, which became effective in November 2018. First, ratings are now assigned based on a fund's historical sustainability score, which considers also the sustainability of the fund's portfolio in the past, even though more recent scores are assigned higher weights. Second, Morningstar no longer ranks funds within the Morningstar category, but considers the Morningstar Global category, a coarser classification. In this way, funds have a larger number of peers. Overall, these changes – making a fund's globe rating less sensitive to the current portfolio and increasing the number of peers – should have decreased funds' incentives to manipulate the globe ratings.

We ask to what extent an arguably improved methodology may have increased the relevance of the sustainability ratings for fund flows. Columns (1) and (2) of Table 12 show that the globe ratings and portfolio sustainability scores are not associated with flows in the period after November 2018, mirroring our results for the latter part of our main sample period. This confirms that the globe ratings and portfolio sustainability scores do not contribute much to the allocation of capital across different funds because investors seem to focus mostly on performance, as captured by the funds' star ratings.

Finally, we consider an alternative measure to evaluate whether our results can be generalized to other sustainability metrics. This is particularly important because several recent papers have raised concerns about the informativeness of ESG ratings (see, e.g., Serafeim, Park, Freiberg, and Zochowski, 2020; Cohen, Gurun, and Nguyen, 2020). Thus, investors with pro-social preferences may have started considering other measures of sustainability, which are easier to interpret. We exploit that in April 2018, Morningstar introduced the *Low Carbon Designation*, identifying mutual funds that have portfolios aligned with a transition to a low carbon economy.

In column (3), we find no evidence that this new measure affects fund flows, supporting our interpretation that when evaluating the tradeoff between sustainability and performance, mutual fund managers and their investors overwhelmingly choose performance.

6. Conclusion

Rating financial intermediaries on the basis of the sustainability of their portfolios may appear to be an effective mechanism that allows investors to allocate funds in accordance with their environmental and social preferences. We show that if most investors care to an even larger extent about performance, a tradeoff between portfolio sustainability and performance arises, which reduces the subsequent effectiveness of sustainability ratings.

The behavior of mutual funds and their investors is consistent with evidence showing that a majority of ESG proposals is not supported by shareholders, and in particular by institutional investors (He, Kahraman, and Lowry, 2020), suggesting that ultimately investors care predominantly about performance. Our findings indicate that regulation may be necessary to direct capital to more sustainable investments.

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Appendix: Variable Definition

Variable Name	Definition
<i>Panel A: Fund Trading</i>	
Trading	<p>The trading in stock i of fund f in quarter t, defined as:</p> $Trading(f, i, t) = \frac{NumShares(f, i, t) - NumShares(f, i, t - 1)}{Shares Outstanding(i, t - 1)}$
Abnormal Trading	<p>The abnormal trading in stock i of fund f in quarter t, defined as the fund's stock trading minus the average trading in stock i between quarters t and $t-1$ across all funds.</p>
Abnormal ESG Trading	<p>The aggregate abnormal ESG trading in quarter t is the abnormal trading across all funds in set G between quarters $t-1$ and t, defined as:</p> $Agg Abnormal ESG Trading(i, t) = \sum_{f=1}^F Abnormal Trading(f, i, t), \quad \text{if } f \in G$ <p>We consider two definitions of the set G. In the ex-post definition, the set G includes all funds that improve their globe ratings. In the ex-ante definition, the set G includes all funds that are within a $\pm 2.5\%$ of the bottom and top globe rating cutoffs.</p>
Effective ESG Score	<p>The normalized company-level ESG score minus a Sustainability controversy deduction. The company-level ESG score is normalized using a z-score transformation within each company's peer group. Morningstar's Portfolio Sustainability Score is based on the weighted average of the stocks' effective scores, with the funds' portfolio shares as weights.</p>
ESG Pressure Trading	$ESG Pressure Trading(f, t) = \sum_{i=1}^N Pressure Trade(f, i, t),$ <p>where $Pressure Trade(f, i, t)$ equals the absolute value of fund f's $Position Change(f, i, t)$ in quarter t if (1) stock i experiences abnormal ESG trading pressure in the top quintile and fund f increases its portfolio share in stock i during quarter t, or if (2) stock i experiences abnormal ESG trading pressure in the bottom quintile and fund f decreases its portfolio share in stock i during quarter t.</p>
Position Change	<p>The position change in stock i of fund f in quarter t, defined as:</p> $Position Change(f, i, t) = \frac{Price(i, t - 1) * [(NumShares(f, i, t) - NumShares(f, i, t - 1))]}{TNA(f, t - 1)}$
Fund turnover (% TNA)	<p>For fund f in quarter t, the fund's portfolio turnover is the aggregate absolute value of the position change between quarters $t-1$ and t across all stock holdings.</p>

<i>Panel B: Fund Characteristics</i>	
Flow (% TNA)	A fund's quarterly flows, defined as $Flow_{S_{j,q}} = \frac{TNA_{j,q} - TNA_{j,q-1} \times (1 + R_{j,q})}{TNA_{j,q-1}}$.
Expense Ratio	Ratio of total fees (as a percentage) that shareholders pay for a fund's operating expenses, including 12b-1 fees.
Ln TNA	Natural logarithm of the fund's month-end total net assets.
Fund Age	Natural logarithm of the fund's age, calculated as the number of years since the oldest share class was made available to investors.
Fund Ret	Monthly net return of a fund's share class.
Star Rating	Rating based on a fund's risk-adjusted return, using Morningstar's Risk-Adjusted Return % Rank for all funds in a given category. Morningstar calculates ratings based on the fund's historical performance in the previous three-, five-, and ten-year periods. The fund must have at least 36 continuous months of historical performance in order to receive a rating. More stars mean better performance. A fund's peer group for the three-, five-, and ten-year ratings is based on the fund's current category without adjusting for category changes. The overall star rating is based on a weighted average (rounded to the nearest integer) of the number of stars received for the past three-, five-, and 10-year performance. See Rating Details in Table A.1.
Globe Rating	A fund's sustainability rating, based on its portfolio sustainability scores. Funds are ranked within their Morningstar categories. A fund rating is based on its percentile rank within the fund's Morningstar category, as detailed in Table A.1. To receive a globe rating, the fund's Morningstar category must have at least 10 funds with portfolio sustainability scores. See Rating Details in Table A.1.
Low Carbon Designation	A fund is assigned a Low Carbon Designation by Morningstar if its portfolio holdings have low carbon risk scores and low levels of fossil fuel exposure. The designation is an indicator that the companies held in a portfolio are in general alignment with the transition to a low carbon economy.
<i>Panel C: Stock Characteristics</i>	
Monthly Abnormal Return	A firm's monthly abnormal return calculated using the Fama-French four-factor model, with betas estimated over the previous 36-months, computed using the quarter-end stock price.
Ln Market Cap	Natural logarithm of a firm's market capitalization.
Book to Market	Book-to-market ratio, calculated as book value of equity scaled by market value of equity, computed using the quarter-end stock price.
Leverage	Calculated as the sum of long-term debt and debt in current liabilities scaled by total assets.
ROA	Return on assets, calculated as operating income, divided by lagged total assets.
Sales Growth	Net sales at t minus net sales at $t-1$, divided by net sales at $t-1$.
Stock Ret	Quarterly stock return.

Figure 1. Demand pressure and stock ESG ratings

This figure presents binscatter plots of *Abnormal ESG Trading* pressure in a stock and its *Effective ESG Score*. *Abnormal ESG Trading* pressure is the abnormal trading in a stock across all funds that improve their globe ratings between quarters $t-1$ and t . *Effective ESG Score* is a firm's ESG score, normalized by subtracting the mean and dividing by the standard deviation of the ESG scores within each firm's peer group, minus a controversy deduction, as reported by Sustainalytics. Detailed variable definitions are provided in the Appendix. The top plot is based on the full sample period from March 2016 to September 2017. The middle plot is based on the first half of the sample period (from March to December 2016), whereas the bottom plot is based on the second half of the sample period (from January to September 2017).

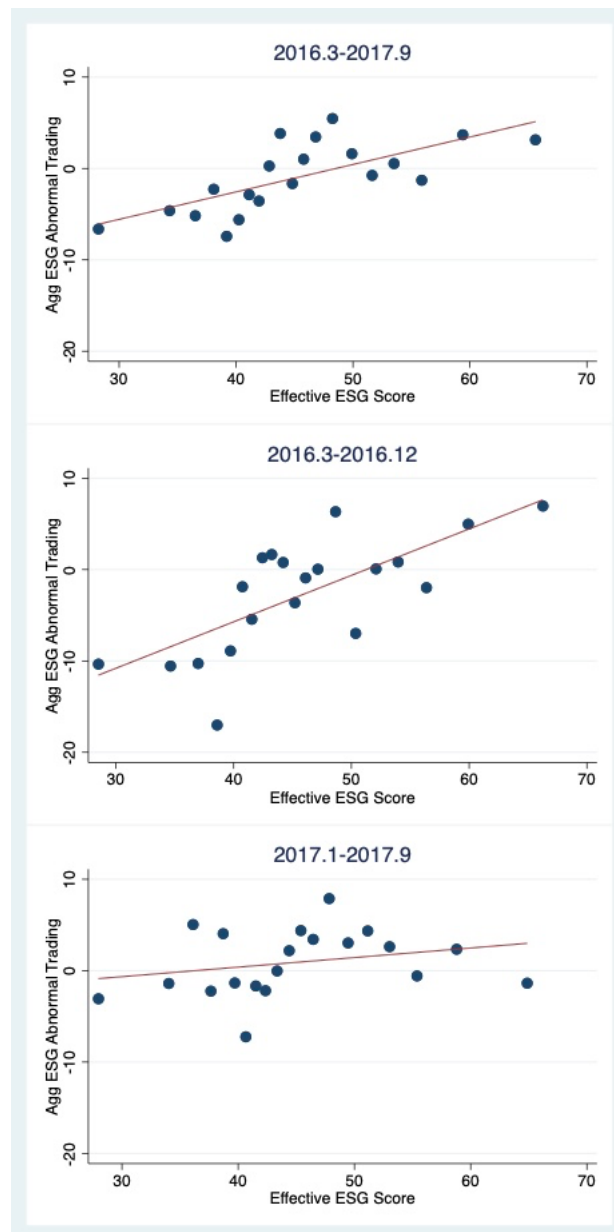


Table 1. Summary statistics

This table reports summary statistics of monthly mutual fund characteristics, including Morningstar ratings (Panel A), quarterly stock characteristics (Panel B), proxies for quarterly changes in mutual funds' portfolios (Panel C), and quarterly fund-stock position changes (Panel D). The sample includes U.S. domiciled funds that invest in U.S. equities, have at least \$10 million in assets under management, and are at least two years old. The sample period is March 2016 to September 2017. All variables are defined in the Appendix.

	Num obs	Mean	Std dev	10 th pctl	Median	90 th pctl
<i>Panel A: Fund (Monthly)</i>						
Flow (% TNA)	34794	-0.005	0.033	-0.03	-0.006	0.018
TNA (\$ million)	34794	2174.318	5462.56	33.734	518.107	4910.048
Fund Age (Years)	34794	17.935	12.215	4.917	16.5	30.333
Ret	34772	1.654	2.774	-1.306	1.296	5.339
Expense Ratio (%)	34676	1.251	0.71	0.57	1.175	1.837
Star Rating	32896	3.214	1.019	2	3	4
Globe Rating	26146	2.987	1.125	1	3	4
Δ Star Rating	32764	-0.003	0.368	0	0	0
Δ Globe Rating	21457	0.003	0.497	-1	0	1
Globe Downgrade	21457	0.105	0.306	0	0	1
Globe Upgrade	21457	0.108	0.311	0	0	1
Star Downgrade	32764	0.068	0.252	0	0	0
Star Upgrade	32764	0.065	0.246	0	0	0
Fund Turnover (% TNA)	32111	0.165	0.155	0.024	0.129	0.325
<i>Panel B: Stock (Quarterly)</i>						
Abnormal ESG Trading (x10000)	21456	-0.911	38.068	-22.082	0	21.091
Effective ESG Score	6469	45.392	8.751	35.504	44.295	57.475
Ln Market Cap	20945	13.669	2.037	11.009	13.648	16.37
Book to Market	20237	0.532	0.521	0.084	0.443	1.099
ROA	19707	0.008	0.058	-0.051	0.019	0.054
Ret	20195	0.046	0.224	-0.19	0.028	0.282
Leverage	19290	0.238	0.226	0	0.191	0.545
Sales Growth Rate	19637	0.044	0.287	-0.165	0.018	0.22
<i>Panel C: Fund (Quarterly)</i>						
ESG Pressure Trading	10065	0.134	3.923	0.009	0.039	0.115
<i>Panel D: Fund-Stock (Quarterly)</i>						
Position Change	1973236	0.001	0.264	-0.094	0	0.089

Table 2. Mutual fund trading and stock ESG ratings

This table estimates the relation between a fund's quarterly position change and a stock's *Effective ESG Score*, which is interacted with an indicator – *Border Funds* – that equals one if a fund is within +/-2.5% of the cutoff between globes 1 and 2 or 4 and 5. *Effective ESG Score* is a firm-level ESG score, as reported by Sustainalytics. Detailed variable definitions are provided in the Appendix. Column (1) shows results for the full sample period from March 2016 to September 2017. Columns (2) and (4)-(7) report results for the first half of the sample period (March – December 2016), whereas column (3) reports results for the second half of the sample period (January – September 2017). Columns (4) and (5) show results for Morningstar fund categories with below-median (*Few Peers*) and above-median (*Many Peers*) number of peers, respectively. Columns (6) and (7) present results for actively-managed funds and index funds, respectively. All specifications include lagged firm-level controls and interactions of fund and time fixed effects. Standard errors are clustered at the fund level.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Position Change (f,i,t)						
	2016.3-2017.9	2016.3-2016.12	2017.1-2017.9	2016.3-2016.12			
		<i>All Funds</i>		<i>Few Peers</i>	<i>Many Peers</i>	<i>Active funds</i>	<i>Index Funds</i>
Effective ESG Score	0.004 (1.201)	-0.004 (-0.797)	0.011*** (2.594)	-0.019** (-2.297)	0.006 (1.094)	-0.002 (-0.262)	-0.007 (-1.533)
Border Funds # Effective ESG Score	0.033** (2.160)	0.047** (2.197)	0.019 (0.939)	0.083*** (2.864)	0.012 (0.377)	0.049** (1.986)	0.047 (1.225)
Ln Market Cap	2.265** (2.476)	4.014*** (3.630)	0.479 (0.518)	5.807*** (3.228)	2.862** (2.096)	0.571 (0.734)	13.306*** (3.888)
Book to Market	0.124 (0.924)	0.078 (0.416)	0.178 (1.251)	0.129 (0.366)	0.071 (0.368)	0.023 (0.112)	0.400 (0.977)
Leverage	1.091*** (7.025)	0.643*** (2.833)	1.429*** (7.124)	1.633*** (4.234)	-0.148 (-0.556)	0.986*** (3.157)	0.117 (0.475)
ROA	-13.819*** (-9.745)	-15.382*** (-7.414)	-12.369*** (-7.652)	-22.659*** (-6.762)	-9.113*** (-3.887)	-20.123*** (-7.375)	-4.471* (-1.745)
Sales Growth Rate	0.083 (0.493)	-0.001 (-0.003)	0.065 (0.326)	-0.645 (-1.529)	0.518 (1.546)	-0.046 (-0.122)	-0.006 (-0.022)
Ret (t-1)	-2.485*** (-7.360)	-1.295*** (-2.982)	-3.475*** (-9.338)	-3.907*** (-5.629)	1.028* (1.923)	-1.713*** (-2.866)	-0.447 (-0.922)
Constant	-5.085** (-2.483)	-9.224*** (-3.725)	-0.782 (-0.375)	-12.492*** (-3.097)	-7.172** (-2.345)	-3.169* (-1.789)	-26.111*** (-3.437)
Observations	1001245	499153	502092	226338	272815	349272	149881
Adjusted R-squared	0.260	0.253	0.269	0.293	0.195	0.180	0.575
Fixed effects	Fund*YQ	Fund*YQ	Fund*YQ	Fund*YQ	Fund*YQ	Fund*YQ	Fund*YQ

Table 3. Aggregate trading pressure and fund sustainability ratings

This table summarizes the *Abnormal ESG Trading* pressure resulting from the funds' incentives to improve their sustainability (globe) ratings. Ex-ante *Abnormal ESG Trading* pressure is the aggregate abnormal trading by funds within $\pm 2.5\%$ of the portfolio ESG score cutoffs between globe ratings 1 and 2 or 4 and 5. Ex-post *Abnormal ESG Trading* pressure is the aggregate abnormal trading by funds that experience an improvement in their globe ratings between quarters $t-1$ and t . *Abnormal ESG Trading* pressure is multiplied by 10000 in this table. We report t -statistics for the null that the mean of the corresponding ESG trading pressure is different from zero. Detailed variable definitions are provided in the Appendix. Column (1) presents results for the full sample period from March 2016 to September 2017. Column (2) reports results for the first half of the sample period (from March to December 2016), whereas column (3) reports results for the second half of the sample period (from January to September 2017).

	(1)	(2)	(3)
<i>Ex-post</i> Definition	2016.3-2017.9	2016.3-2016.12	2017.1-2017.9
Abnormal ESG Trading	-0.858	-1.882	0.159
t -stat	-3.306	-4.644	0.479
<i>Ex-ante</i> Definition	2016.3-2017.9	2016.3-2016.12	2017.1-2017.9
Abnormal ESG Trading	-0.273	-0.709	0.16
t -stat	-1.17	-2.907	0.404

Table 4. Aggregate trading pressure and stock ESG ratings

This table estimates the relation between *Abnormal ESG Trading* pressure and a stock's *Effective ESG Score*. *Abnormal ESG Trading Pressure* is the abnormal trading of all mutual funds that experience an improvement in their globe ratings between quarters $t-1$ and t , relative to non-improving funds. *Effective ESG Score* is the Sustainalytics firm-level ESG score. Detailed variable definitions are provided in the Appendix. Columns (1) and (4) present results for the full sample period from March 2016 to September 2017, column (2) reports results for the first half of the sample period (from March to December 2016), and column (3) reports results for the second half of the sample period (from January to September 2017). All specifications include lagged firm-level control variables and interactions of industry and time fixed effects. Standard errors are clustered at the firm level. Statistical significance at the 10%, 5%, and 1% level is denoted by *, **, and ***, respectively.

	(1)	(2)	(3)	(4)
	Abnormal ESG Trading			
	2016.3-2017.9	2016.3-2016.12	2017.1-2017.9	2016.3-2017.9
Effective ESG Score	0.249*** (4.257)	0.431*** (4.478)	0.055 (0.745)	0.047 (0.632)
Effective ESG Score # First 9 months dummy				0.395*** (3.090)
Ln Market Cap	0.178 (0.417)	0.146 (0.212)	0.093 (0.231)	0.148 (0.348)
Book to Market	-2.250 (-1.164)	-4.985* (-1.810)	1.923 (0.966)	-2.184 (-1.133)
Leverage	-6.379 (-1.638)	-8.609 (-1.415)	-3.233 (-0.701)	-6.225 (-1.603)
ROA	7.168 (0.264)	28.177 (0.688)	-8.988 (-0.244)	7.537 (0.277)
Sales Growth Rate	-1.191 (-0.494)	-3.154 (-0.872)	1.359 (0.410)	-1.067 (-0.441)
Ret (t-1)	-1.041 (-0.292)	0.483 (0.091)	-2.598 (-0.610)	-1.016 (-0.286)
Constant	-12.054 (-1.466)	-20.541 (-1.598)	-2.066 (-0.243)	-11.688 (-1.425)
Observations	5706	2901	2805	5706
Adjusted R-squared	0.009	0.011	0.006	0.010
Fixed effects	Ind*YQ	Ind*YQ	Ind*YQ	Ind*YQ

Table 5. Sustainability-driven trading pressure and stock returns

This table studies the effect of sustainability-driven trading pressure on stock returns. We report daily equal- and value-weighted returns on a zero-cost long-short portfolio, constructed by buying stocks with negative sustainability-driven trading pressure (Abnormal ESG Trading < 0) and shorting stocks with positive sustainability-driven trading pressure (Abnormal ESG Trading ≥ 0). The portfolio is rebalanced at the end of each quarter. Columns (1) and (3) show results for the first half of the sample period from July to December 2016 (the first quarter after the introduction of the globe ratings is used to obtain the portfolio sorts). Columns (2) and (4) report results for the second half of the sample period from January to September 2017. We estimate Newey-West standard errors with 22 lags. Statistical significance at the 10%, 5%, and 1% level is denoted by *, **, and ***, respectively.

	(1)	(2)	(3)	(4)
	2016.7-2016.12	2017.1-2017.9	2016.7-2016.12	2017.1-2017.9
	<i>Equal-weighted</i>		<i>Value-weighted</i>	
Alpha	0.043** (2.247)	0.005 (0.430)	0.021* (1.675)	-0.018 (-1.591)
Mkt-RF	-0.159*** (-12.580)	-0.062** (-2.033)	0.011 (0.291)	-0.050* (-1.721)
SMB	-0.132*** (-6.883)	-0.054 (-1.193)	-0.053 (-1.532)	0.046 (0.953)
HML	-0.182*** (-5.187)	-0.039* (-1.785)	-0.039 (-1.490)	0.038** (2.015)
Mom	-0.111*** (-3.544)	0.044 (1.386)	-0.020 (-0.325)	0.012 (0.329)
Observations	127	188	127	188
R-squared	0.483	0.132	0.035	0.044

Table 6. Sustainability-driven trading pressure and trading of funds pursuing star ratings

This table reports the effect of sustainability-driven trading pressure on stock trading by funds attempting to improve their star ratings. Panel A presents the trading of U.S. domiciled U.S. equity funds that do not improve their globe ratings during a given quarter. Columns (5) and (6) separate U.S. equity funds into index and actively-managed funds, respectively. Columns (1) and (4) present results for the full sample period from March 2016 to September 2017, columns (2) and (5)-(6) report results for the first half of the sample period (from March to December 2016), and column (3) reports results for the second half of the sample period (from January to September 2017). Panel B presents the trading of U.S. equity funds split by their closeness to the star rating cutoffs. Panel C presents the trading of U.S. equity funds that are above/below the median in terms of the number of peers in the same Morningstar category. In Panels B and C, odd-numbered (even-numbered) columns report results for the first half (second half) of the sample period. All specifications include interactions of fund and time fixed effects. Standard errors are clustered at the fund level. Statistical significance at the 10%, 5%, and 1% level is denoted by *, **, and ***, respectively.

Panel A. Trading of U.S. equity funds that do not improve their globe ratings						
	(1)	(2)	(3)	(4)	(5)	(6)
	Position Change (f,i,t)					
	<i>All funds</i>				<i>Index Funds</i>	<i>Active Funds</i>
	2016.3-2017.9	2016.3-2016.12	2017.1-2017.9	2016.3-2017.9	2016.3-2016.12	
Abnormal ESG Trading	-0.384*** (-5.388)	-0.591*** (-6.166)	-0.045 (-0.483)	-0.045 (-0.483)	-0.080 (-0.950)	-0.860*** (-6.167)
First 9 months dummy # Abnormal ESG Trading				-0.546*** (-4.263)		
Constant	0.208*** (214.190)	-0.266*** (-119.100)	0.739*** (2867.888)	0.206*** (172.367)	2.056*** (1096.955)	-1.479*** (-445.138)
Observations	1815668	962990	852678	1815668	330721	632218
Adjusted R-squared	0.287	0.286	0.289	0.287	0.567	0.224
Fixed effects	Fund*YQ	Fund*YQ	Fund*YQ	Fund*YQ	Fund*YQ	Fund*YQ

Panel B. Trading of U.S. equity funds split by closeness to the star rating cutoffs

	(1)	(2)	(3)	(4)	(5)	(6)
	Position Change (<i>f,i,t</i>)					
	2016.3-2016.12	2017.1-2017.9	2016.3-2016.12	2017.1-2017.9	2016.3-2016.12	2017.1-2017.9
	<i>Other</i>		<i>Within ± 5%</i>		<i>Within ± 2.5%</i>	
Abnormal ESG Trading	-0.244** (-2.139)	0.195* (1.760)	-0.678*** (-2.671)	-0.168 (-0.825)	-0.831*** (-4.609)	-0.223 (-1.216)
Constant	2.079*** (808.980)	3.036*** (9829.437)	0.213*** (33.308)	0.049*** (91.528)	-1.525*** (-358.215)	-0.191*** (-397.910)
Observations	176166	157295	178099	158058	317854	291598
Adjusted R-squared	0.535	0.683	0.315	0.201	0.194	0.207
Fixed effects	Fund*YQ	Fund*YQ	Fund*YQ	Fund*YQ	Fund*YQ	Fund*YQ

Panel C. Trading of U.S. equity funds with below/above median peers within their star rating category

	(1)	(2)	(3)	(4)	(5)	(6)
	Position Change (<i>f,i,t</i>)					
	2016.3-2016.12	2017.1-2017.9	2016.3-2016.12	2017.1-2017.9	2016.3-2016.12	2017.1-2017.9
	<i>All Funds</i>		<i>Below-Median Peers</i>		<i>Above Median-Peers</i>	
Abnormal ESG Trading	-0.232* (-1.870)	0.078 (0.576)	-0.393** (-2.300)	-0.504*** (-2.648)	0.052 (0.298)	0.837*** (3.843)
Within ±5% of Rating Cutoff # Abnormal ESG Trading	-0.544*** (-2.872)	-0.282 (-1.445)	-0.608** (-2.434)	-0.411 (-1.613)	-0.366 (-1.306)	0.573* (1.663)
Constant	-1.012*** (-435.009)	0.363*** (1462.214)	-1.096*** (-351.206)	0.630*** (774.362)	-0.868*** (-254.513)	-0.026*** (-42.848)
Observations	856607	777373	540332	455708	316275	321665
Adjusted R-squared	0.233	0.257	0.252	0.285	0.191	0.213
Fixed effects	Fund*YQ	Fund*YQ	Fund*YQ	Fund*YQ	Fund*YQ	Fund*YQ

Table 7. Ex-ante sustainability-driven trading pressure and trading of funds pursuing star ratings

This table explores the effects of sustainability-driven trading pressure on the trading of funds with stronger incentives to pursue higher performance ratings. Differently from Table 6, we use an ex-ante proxy for *Abnormal ESG Trading* based on the funds' distance from the star rating cutoffs. Column (1) reports the trading of funds within $\pm 2.5\%$ of the star rating cutoffs, column (2) includes funds within $\pm 5\%$ of the star rating cutoffs (excluding the funds in column (1)), and column (3) reports the trading of all other funds. All specifications include interactions of fund and year-quarter fixed effects. Standard errors are clustered at the fund level.

	(1)	(2)	(3)
	Position Change (f,i,t)		
	<i>Within $\pm 2.5\%$</i>	<i>Within $\pm 5\%$</i>	<i>Other</i>
Abnormal ESG Trading (<i>ex-ante</i>)	-0.295 (-1.368)	-0.405 (-1.640)	-0.288* (-1.929)
First 9 months dummy # Abnormal ESG Trading (<i>ex-ante</i>)	-1.740*** (-4.563)	-1.094** (-2.135)	-1.022*** (-3.928)
Constant	-0.988*** (-625.836)	-0.034*** (-14.481)	0.872*** (1029.795)
Observations	670825	365392	937018
Adjusted R-squared	0.188	0.255	0.329
Fixed effects	Fund*YQ	Fund*YQ	Fund*YQ

Table 8. Tradeoff between sustainability and performance

Panel A of this table explores the tradeoff between star and globe ratings. For each quarter, we rank the *Abnormal ESG Trading* across stocks into quintiles. We then measure a fund's *ESG Pressure Trading* in each quarter as the sum of the purchases of any stocks in the top quintile of *Abnormal ESG Trading* and of the sales of any stocks in the bottom quintile of *Abnormal ESG Trading*. We estimate a fund-level relationship between the star/globe rating changes and the fund's *ESG Pressure Trading* during quarter $t-1$. Columns (1) and (2) consider the full sample period from March 2016 to September 2017; column (3) reports results for the first half of the sample period (March to December 2016), and column (4) reports results for the second half of the sample period (January to September 2017). Panel B reports the relationship between a fund's monthly abnormal returns and its *ESG Pressure Trading* during quarter $t-1$. Abnormal returns are estimated using the Fama-French four-factor model with a 36-month rolling window. All specifications include lagged fund-level controls and interactions of Morningstar category and year-month fixed effects. Standard errors are clustered at the fund level. Statistical significance at the 10%, 5%, and 1% level is denoted by *, **, and ***, respectively.

Panel A. Rating downgrades and upgrades

	(1)	(2)	(3)	(4)
	Δ Globe Rating	Δ Star Rating		
	2016.3 - 2017.9	2016.3 - 2017.9	2016.3-2016.12	2017.1 - 2017.9
ESG Pressure Trading	0.651*** (4.727)	-0.055 (-0.578)	-0.311** (-2.079)	0.118 (0.946)
Fund Turnover (% TNA)	-0.232*** (-4.633)	-0.015 (-0.444)	0.067 (1.238)	-0.065 (-1.560)
One Star ($t-1$)	-0.007 (-0.363)	0.182*** (11.210)	0.203*** (8.885)	0.164*** (8.417)
Two Stars ($t-1$)	-0.002 (-0.169)	0.092*** (8.390)	0.110*** (7.217)	0.078*** (6.259)
Four Stars ($t-1$)	-0.002 (-0.284)	-0.081*** (-9.101)	-0.098*** (-7.837)	-0.068*** (-6.690)
Five Stars ($t-1$)	0.024** (1.966)	-0.216*** (-16.306)	-0.237*** (-13.684)	-0.200*** (-12.811)
One Globe ($t-1$)	0.196*** (12.798)	-0.008 (-0.906)	-0.021 (-1.482)	0.001 (0.124)
Two Globes ($t-1$)	0.075*** (5.499)	-0.001 (-0.239)	0.004 (0.440)	-0.005 (-0.614)
Four Globes ($t-1$)	-0.102*** (-7.497)	-0.006 (-1.044)	-0.004 (-0.412)	-0.008 (-1.026)
Five Globes ($t-1$)	-0.215*** (-13.199)	0.001 (0.165)	-0.004 (-0.329)	0.006 (0.543)
Flow ($t-1$)	-0.069 (-0.573)	0.659*** (8.078)	0.824*** (6.409)	0.522*** (5.144)
Ret ($t-1$)	0.000 (0.074)	0.006** (2.214)	0.009** (2.489)	0.002 (0.482)
Ln TNA ($t-1$)	-0.001 (-0.343)	0.020*** (13.103)	0.021*** (9.098)	0.019*** (10.241)
Age	0.012** (2.120)	-0.008** (-1.985)	-0.007 (-0.974)	-0.010* (-1.953)
Constant	-0.010 (-0.223)	-0.354*** (-11.896)	-0.372*** (-8.258)	-0.336*** (-9.124)
Observations	21913	21893	7967	13926
Adjusted R-squared	0.057	0.051	0.064	0.043
Fixed effects	Cat*YM	Cat*YM	Cat*YM	Cat*YM

Panel B. Fund performance			
	(1)	(2)	(3)
	Monthly abnormal returns		
	2016.3 - 2017.9	2016.3-2016.12	2017.1 - 2017.9
ESG Pressure Trading	-0.366 (-1.302)	-1.632*** (-3.372)	0.231 (0.707)
Fund Turnover (% TNA)	0.100 (1.038)	0.625*** (3.537)	-0.182* (-1.699)
Flow ($t-1$)	0.066 (0.322)	0.276 (0.785)	0.146 (0.590)
Ln TNA ($t-1$)	0.015*** (3.055)	0.025*** (3.099)	0.009* (1.747)
Age	-0.001** (-2.298)	-0.002** (-2.174)	-0.001** (-1.977)
Exp Ratio ($t-1$)	-0.012 (-0.840)	-0.017 (-0.789)	-0.005 (-0.264)
Ret ($t-1$)	-0.031*** (-4.513)	-0.022** (-2.141)	-0.044*** (-3.793)
Ret ($t-12, t-1$)	-0.005*** (-2.698)	-0.021*** (-6.270)	0.004 (1.484)
Constant	-0.270** (-2.568)	-0.515*** (-2.952)	-0.245** (-2.090)
Observations	26628	10528	16100
Adjusted R-squared	0.172	0.176	0.174
Fixed effects	Cat*YM	Cat*YM	Cat*YM

Table 9. Effects of ratings on fund flows

Panel A of this table reports the effects of globe ratings on monthly fund flows. Columns (1) and (4) show results for the full sample period from March 2016 to September 2017, columns (2) and (5) report results for the first half of the sample period (March to December 2016), and columns (3) and (6) report results for the second half of the sample period (January to September 2017). Columns (1)-(3) use globe 3 as the baseline, whereas columns (4)-(6) use the three middle globe ratings as the baseline. Panel B reports the effects of star and globe ratings on fund flows. Panel C reports the effects of star and globe ratings on fund flows for institutional and retail share classes. All specifications include lagged controls for the fund's returns, size, age, and expense ratio as well as interactions of the fund's Morningstar category and year-month fixed effects. In Panel A, we also include the fund's categorical star rating at $t-1$. Panels B and C perform a horse race between star and globe ratings at $t-1$ to evaluate their effects on fund flows. Standard errors are clustered at the fund level. Statistical significance at the 10%, 5%, and 1% level is denoted by *, **, and ***, respectively.

Panel A. Globe ratings and fund flows

	(1)	(2)	(3)	(4)	(5)	(6)
	Flows (% TNA)					
	2016.3-2017.9	2016.3-2016.12	2017.1-2017.9	2016.3-2017.9	2016.3-2016.12	2017.1-2017.9
One Globe	-0.002 (-1.544)	-0.003** (-1.998)	-0.001 (-0.365)	-0.002** (-2.082)	-0.004** (-2.426)	-0.001 (-0.685)
Two Globes	0.000 (0.251)	-0.000 (-0.416)	0.001 (0.692)			
Four Globes	0.001* (1.715)	0.002* (1.792)	0.001 (0.838)			
Five Globes	0.002* (1.958)	0.004** (2.446)	0.001 (0.533)	0.002* (1.742)	0.004** (2.345)	0.000 (0.279)
Observations	23141	11548	11593	23141	11548	11593
Adjusted R-squared	0.089	0.100	0.079	0.089	0.099	0.079
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed effects	Cat*YM	Cat*YM	Cat*YM	Cat*YM	Cat*YM	Cat*YM

Panel B. Star and globe ratings and fund flows

	(1)	(2)	(3)	(4)	(5)	(6)
	Flows (% TNA)					
	2016.3-2017.9	2016.3-2016.12	2017.1-2017.9	2016.3-2017.9	2016.3-2016.12	2017.1-2017.9
One Globe	-0.002* (-1.801)	-0.004** (-2.286)	-0.001 (-0.479)	-0.002** (-2.334)	-0.004*** (-2.668)	-0.001 (-0.807)
Two Globes	0.000 (0.199)	-0.000 (-0.506)	0.001 (0.679)			
Four Globes	0.001 (1.599)	0.002 (1.532)	0.001 (0.854)			
Five Globes	0.002* (1.655)	0.003** (2.112)	0.001 (0.389)	0.002 (1.442)	0.003** (2.053)	0.000 (0.121)
One Star	-0.011*** (-6.097)	-0.011*** (-5.070)	-0.012*** (-4.852)	-0.011*** (-6.092)	-0.011*** (-5.048)	-0.012*** (-4.850)
Two Stars	-0.007*** (-7.364)	-0.006*** (-5.462)	-0.007*** (-5.899)	-0.007*** (-7.341)	-0.006*** (-5.416)	-0.007*** (-5.897)
Four Stars	0.009*** (11.392)	0.009*** (9.246)	0.008*** (9.236)	0.009*** (11.369)	0.009*** (9.232)	0.008*** (9.194)
Five Stars	0.022*** (11.793)	0.025*** (11.170)	0.020*** (9.617)	0.022*** (11.811)	0.025*** (11.251)	0.020*** (9.607)
Observations	23141	11548	11593	23141	11548	11593
Adjusted R-squared	0.093	0.105	0.080	0.093	0.104	0.080
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed effects	Cat*YM	Cat*YM	Cat*YM	Cat*YM	Cat*YM	Cat*YM

Panel C. Institutional and retail share classes

	(1)	(2)	(3)	(4)	(5)	(6)
	<i>Institutional Flows</i>			<i>Retail Flows</i>		
	2016.3-2017.9	2016.3-2016.12	2017.1-2017.9	2016.3-2017.9	2016.3-2016.12	2017.1-2017.9
One Globe	-0.001 (-0.520)	-0.002 (-1.076)	0.001 (0.285)	-0.003** (-2.180)	-0.004** (-2.223)	-0.002 (-0.838)
Five Globes	0.003 (1.468)	0.004* (1.668)	0.002 (0.723)	0.000 (0.193)	0.003 (1.454)	-0.003 (-1.596)
One Star	-0.018*** (-6.038)	-0.019*** (-4.404)	-0.017*** (-4.315)	-0.008*** (-4.998)	-0.009*** (-4.776)	-0.007*** (-3.270)
Two Stars	-0.012*** (-9.197)	-0.013*** (-8.095)	-0.012*** (-6.593)	-0.006*** (-7.171)	-0.007*** (-5.809)	-0.005*** (-4.714)
Four Stars	0.010*** (9.202)	0.011*** (8.322)	0.010*** (6.776)	0.010*** (9.864)	0.012*** (9.160)	0.008*** (6.666)
Five Stars	0.031*** (10.842)	0.036*** (10.590)	0.025*** (8.205)	0.025*** (8.022)	0.030*** (6.773)	0.019*** (6.719)
Observations	31667	15601	16066	34906	17686	17220
Adjusted R-squared	0.056	0.075	0.041	0.066	0.089	0.045
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed effects	Cat*YM	Cat*YM	Cat*YM	Cat*YM	Cat*YM	Cat*YM

Table 10. Effects of rating upgrades and downgrades on fund flows

This table reports the effects of star and globe rating upgrades and downgrades on monthly fund flows. Column (1) presents results for the full sample period from March 2016 to September 2017, column (2) reports results for the first half of the sample period (March to December 2016), and column (3) reports results for the second half of the sample period (January to September 2017). All specifications include lagged controls for the fund's returns, size, age, and expense ratio as well as interactions of the fund's Morningstar category and year-month fixed effects. Standard errors are clustered at the fund level. Statistical significance at the 10%, 5%, and 1% level is denoted by *, **, and ***, respectively.

	(1)	(2)	(3)
	Flow (% TNA)		
	2016.3-2017.9	2016.3-2016.12	2017.1-2017.9
Globe Downgrade	-0.001 (-0.837)	-0.002* (-1.757)	0.001 (0.749)
Globe Upgrade	0.001 (1.614)	0.001 (0.806)	0.002 (1.633)
Star Downgrade	-0.004*** (-4.754)	-0.005*** (-4.326)	-0.003** (-2.400)
Star Upgrade	0.007*** (7.438)	0.009*** (6.829)	0.005*** (3.766)
One Globe (<i>t</i> -1)	-0.001 (-0.817)	-0.003** (-2.008)	0.002 (0.979)
Two Globes (<i>t</i> -1)	0.000 (0.514)	-0.000 (-0.132)	0.001 (0.841)
Four Globes (<i>t</i> -1)	0.002** (2.334)	0.002* (1.898)	0.002 (1.618)
Five Globes (<i>t</i> -1)	0.003** (2.153)	0.004** (2.236)	0.002 (0.905)
One Star (<i>t</i> -1)	-0.012*** (-5.595)	-0.011*** (-4.709)	-0.013*** (-4.781)
Two Stars (<i>t</i> -1)	-0.007*** (-6.908)	-0.006*** (-5.508)	-0.007*** (-5.291)
Four Stars (<i>t</i> -1)	0.010*** (11.414)	0.011*** (10.147)	0.008*** (8.152)
Five Stars (<i>t</i> -1)	0.023*** (10.964)	0.026*** (10.750)	0.019*** (8.427)
Observations	19421	10669	8752
Adjusted R-squared	0.097	0.115	0.074
Controls	Yes	Yes	Yes
Fixed effects	Cat*YM	Cat*YM	Cat*YM

Table 11. Effects of sustainability scores on fund flows

This table reports the effect of a fund's *Portfolio Sustainability Score* on monthly fund flows. Column (1) shows results for the full sample period from March 2016 through September 2017, column (2) reports results for the first half of the sample period from March to December 2016, and column (3) reports results for the second half of the sample period from January to September 2017. All specifications include lagged controls for the fund's returns, size, age, and expense ratio as well as interactions of the fund's Morningstar category and year-month fixed effects. Standard errors are clustered at the fund level. Statistical significance at the 10%, 5%, and 1% level is denoted by *, **, and ***, respectively.

	(1)	(2)	(3)
		Flows (% TNA)	
	2016.3-2017.9	2016.3-2016.12	2017.1-2017.9
Portfolio Sustainability Score	0.056** (2.197)	0.116*** (3.380)	-0.000 (-0.010)
One Star (<i>t</i> -1)	-0.011*** (-5.433)	-0.010*** (-4.313)	-0.012*** (-4.547)
Two Stars (<i>t</i> -1)	-0.006*** (-6.799)	-0.006*** (-4.500)	-0.007*** (-5.582)
Four Stars (<i>t</i> -1)	0.009*** (10.652)	0.009*** (8.315)	0.008*** (8.747)
Five Stars (<i>t</i> -1)	0.021*** (10.844)	0.023*** (10.273)	0.019*** (8.862)
Observations	19382	8914	10468
Adjusted R-squared	0.088	0.100	0.077
Controls	Yes	Yes	Yes
Fixed Effects	Cat*YM	Cat * YM	Cat * YM

Table 12. Morningstar's modified methodology and fund flows

This table reports the effects of a fund's globe rating, *Portfolio Sustainability Score*, and *Low Carbon Designation* on fund flows after November 2018 when Morningstar modified its globe rating methodology. In column (1), we use globe 3 as the baseline. In columns (2) and (3), we examine the effects of two other sustainability measures, the fund's continuous *Portfolio Sustainability Score* and its *Low Carbon Designation*, respectively. All specifications include lagged controls for the fund's returns, size, age, and expense ratio as well as interactions of the fund's Morningstar category and year-month fixed effects. Standard errors are clustered at the fund level. Statistical significance at the 10%, 5%, and 1% level is denoted by *, **, and ***, respectively.

	(1)	(2)	(3)
	Flows (% TNA)		
	2018.11 - 2019.9		
One Globe	-0.002 (-1.228)		
Two Globe	0.001 (1.211)		
Four Globe	0.001 (1.147)		
Five Globe	0.001 (0.410)		
Portfolio Sustainability Score		0.000 (1.091)	
Low Carbon Designation			-0.001 (-0.886)
One Star (<i>t</i> -1)	-0.006*** (-3.810)	-0.007*** (-3.989)	-0.007*** (-4.126)
Two Stars (<i>t</i> -1)	-0.004*** (-3.456)	-0.004*** (-3.494)	-0.004*** (-3.675)
Four Stars (<i>t</i> -1)	0.010*** (10.935)	0.010*** (11.000)	0.010*** (10.974)
Five Stars (<i>t</i> -1)	0.025*** (12.999)	0.025*** (13.142)	0.025*** (13.170)
Observations	15931	16358	16699
Adjusted R-squared	0.107	0.109	0.109
Controls	Yes	Yes	Yes
Fixed effects	Cat * YM	Cat * YM	Cat * YM

Table A.1. Morningstar's Star and Globe ratings

Morningstar Performance Ratings (Star Ratings)		
Score	Percent	Label
5	Top 10%	High
4	Next 22.5%	Above Average
3	Next 35%	Average
2	Next 22.5%	Below Average
1	Bottom 10%	Low

Morningstar Sustainability Ratings (Globe Ratings)		
Score	Percent	Label
5	Highest 10%	High
4	Next 22.5%	Above Average
3	Next 35%	Average
2	Next 22.5%	Below Average
1	Lowest 10%	Low

Table A.2. Ratings turnover over the sample period

This table shows the frequency of globe and star rating upgrades and downgrades in the first and second part of the sample period from March 2016 to September 2017. Panel A includes all globe/star upgrades and downgrades, whereas Panel B focuses on upgrades from globe/star 1 to 2 and 4 to 5 and downgrades from globe/star 5 to 4 and 2 to 1.

	Globes		Star	
	<i>Upgrade</i>	<i>Downgrade</i>	<i>Upgrade</i>	<i>Downgrade</i>
Panel A: all changes				
2016.3 - 2016.12	11.95%	10.43%	6.65%	7.06%
2017.1 - 2017.9	9.81%	9.73%	6.00%	6.35%
Panel B: change to/from top/bottom rating				
2016.3 - 2016.12	2.55%	2.18%	1.49%	1.67%
2017.1 - 2017.9	2.82%	2.85%	1.33%	1.30%

Table A.3. The interaction of sustainability and performance ratings and fund flows

This table reports the effects of the interaction between funds' sustainability and performance ratings on monthly fund flows. Columns (1) and (4) show results for the full sample period from March 2016 through September 2017, columns (2) and (5) report results for the first half of the sample period (March to December 2016), and columns (3) and (6) report results for the second half of the sample period (January to September 2017). All specifications include lagged controls for the fund's categorical star rating, returns, size, age, and expense ratio as well as interactions of the fund's Morningstar category and year-month fixed effects. Standard errors are clustered at the fund level. Statistical significance at the 10%, 5%, and 1% level is denoted by *, **, and ***, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	Flows (% TNA)					
	2016.3- 2017.9	2016.3- 2016.12	2017.1- 2017.9	2016.3- 2017.9	2016.3- 2016.12	2017.1- 2017.9
One Globe # Star Downgrade	0.002 (0.726)	0.004 (1.365)	-0.000 (-0.095)			
Five Globes # Star Downgrade	-0.001 (-0.468)	0.001 (0.387)	-0.005 (-1.489)			
Star Downgrade	-0.006*** (-5.523)	-0.007*** (-4.998)	-0.004*** (-2.866)			
Monthly Return				0.002*** (8.031)	0.002*** (6.888)	0.002*** (4.284)
One Globe # Return				0.000 (0.651)	0.000 (0.100)	0.001 (1.069)
Five Globes # Return				-0.000 (-0.715)	-0.001* (-1.805)	0.001 (1.465)
One Globe	-0.001 (-1.348)	-0.003** (-2.331)	0.001 (0.408)	-0.002 (-1.560)	-0.003** (-2.412)	-0.001 (-0.358)
Five Globes	0.002* (1.712)	0.002 (1.635)	0.001 (0.889)	0.002* (1.907)	0.003** (2.287)	-0.001 (-0.345)
Observations	22166	11543	10623	22190	11547	10643
Adjusted R-squared	0.089	0.106	0.069	0.090	0.106	0.072
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Cat*YM	Cat*YM	Cat*YM	Cat*YM	Cat*YM	Cat*YM

Table A.4. Sustainability-driven trading pressure and stock returns

This table studies the effect of sustainability-driven trading pressure on daily stock returns from July 2016 through October 2016, excluding the month of the Trump election and the following month. We report daily equal- and value-weighted returns on a zero-cost long-short portfolio, constructed by buying stocks with negative sustainability-driven trading pressure (Abnormal ESG Trading < 0) and shorting stocks with positive sustainability-driven trading pressure (Abnormal ESG Trading ≥ 0). The portfolio is rebalanced at the end of each quarter. The first quarter after the introduction of the globe ratings is used to obtain the portfolio sorts. The estimation uses Newey-West standard errors with 22 lags. Statistical significance at the 10%, 5%, and 1% level is denoted by *, **, and ***, respectively.

	(1)	(2)
	2016.7 - 2016.10	
	<i>Equal-weighted</i>	<i>Value-weighted</i>
Alpha	0.047*** (2.837)	0.020** (2.189)
Mkt-RF	-0.179*** (-7.870)	-0.044** (-2.370)
SMB	-0.071 (-1.471)	0.034 (0.387)
HML	-0.223*** (-5.165)	-0.009 (-0.312)
Mom	-0.147*** (-6.250)	-0.072 (-1.480)
Observations	85	85
R-squared	0.475	0.109

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