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Sustainability or Performance? Ratings and Fund Managers' Incentives

Finance Working Paper N° 747/2021
September 2021

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ECGI Working Paper Series in Finance

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We thank Darwin Choi, Diane Del Guercio, Chotibhak (Pab) Jotikasthira, Marcin Kacperczyk, José Scheinkman, and Patrick Verwijmeren for helpful discussions, and seminar participants at the Center for Economic Policy Research (CEPR) Endless Summer Conference, the Asian Bureau of Finance and Economic Research (ABFER) 8th Annual Conference, the American University, Baylor University, City University of Hong Kong, Louisiana State University, the Stockholm School of Economics, the University of Kansas, the University of Liverpool, and the University of Oregon. Giannetti acknowledges financial support from the Nasdaq Nordic Foundation and the Jan Wallander and Tom Hedelius Foundation.

Abstract

We explore how mutual fund investors collectively value sustainability when the tradeoff with performance becomes salient. Following the introduction of Morningstar's sustainability ratings (the "globe" ratings), mutual funds increased their holdings of sustainable stocks in an attempt 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 and the performance of funds improving their globe ratings deteriorated. Since performance appears to be more important in attracting flows than sustainability, in the new equilibrium, the globe ratings do not affect investor flows and funds do not trade to improve their globe ratings.

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

JEL Classifications: G11, G12, G23, G24

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We explore how mutual fund investors collectively value sustainability when the tradeoff with performance becomes salient. Following the introduction of Morningstar's sustainability ratings (the "globe" ratings), mutual funds increased their holdings of sustainable stocks in an attempt 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 and the performance of funds improving their globe ratings deteriorated. Since performance appears to be more important in attracting flows than sustainability, in the new equilibrium, the globe ratings do not affect investor flows and funds do not trade to improve their globe ratings.

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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 Sussmann (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 performance and most market participants do not take it into account (Pedersen, Fitzgibbons, and Pomorski, 2019).

However, in an attempt 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 weight that mutual funds' investors in the aggregate put on performance versus sustainability is 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 high sustainability ratings, 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 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 in an attempt to improve the sustainability rankings of their portfolios. This generated buying (selling) pressure and stocks with high (low) sustainability ratings became overvalued (undervalued) as a result of the mutual funds' trading behavior. Importantly, we show that these patterns are unrelated to changes 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 became undervalued (overvalued) because of the trading of 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 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 if in the initial period the performance and sustainability ratings were congruent, 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 no longer 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.

Taken together, our results suggest that fund managers became aware of the trade-off between sustainability and performance and chose to pursue performance, which leads to higher flows, and is therefore better aligned with the managers' compensation structure. At the same time, mutual funds' investors, and especially institutions that may have chosen high sustainability-rated funds to signal their own ESG credentials to clients, may 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. Considering investment products without an explicit sustainability focus, we show that too few 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). To the best of our knowledge, our paper is the first to highlight the tensions arising when funds are rated along two different dimensions that may create opposing incentives for fund managers aiming to

[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.

improve their funds' ratings. 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 higher stock returns because of institutional investors' preferences against stocks with these characteristics. 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 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 category. 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 report performance for at least 36 months to obtain a star rating.[3]

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). 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 represent the beneficial ownership interest (Gallagher, Schmidt, Timmermann, and Wermers, 2020), star ratings are associated with 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

[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_for_Funds_Methodology.pdf.

[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 sustainability ratings by switching the peer-fund category from the Morningstar category to the more comprehensive Morningstar Global category. We show that this change does 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 category. 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 Sussmann, 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 can more easily communicate the sustainability of their asset holdings to 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 with at least $10 million in assets under management that are at least two years old. We also require funds to have information about their return, age, expense ratio, TNA, and Morningstar category. The final sample for our main analysis is between March 2016 and December 2017 and includes 1,953 unique funds.[5] For each fund, we aggregate fund size (TNA) and flows across share classes

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

and calculate the fund's mean expense ratio and return. 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.

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. These incentives to pursue better sustainability ratings should also differ across funds. In particular, as shown for firms' capital structure (Kisgen, 2006), 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.

Hartzmark and Sussmann (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 buying (selling) pressure in stocks with high (low) ESG scores.

To evaluate how the globe ratings affect fund managers' incentives. Table 2 studies a quarterly fund-stock 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 conjecture that funds with a sustainability rating within +/-2.5% of the portfolio 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.

We find that funds with strong incentives to improve or to maintain their globe ratings indeed increase their holdings of stocks with high ESG ratings, as captured by the stock's Sustainalytics *Effective ESG Score*. For example, in column (2), an interquartile increase in a stock's effective ESG score is associated with a 0.36% increase in the position of funds with sustainability ratings close to the cutoffs. This increase is about 3.5 times the average change in position.[6] In column (4), border funds that are more likely to be upgraded because they compete with fewer peers 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 we show below, this is consistent with a new equilibrium in 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 identify index funds using the corresponding Morningstar flag. Reassuringly, columns (6) and (7) show that active border funds with few peers exhibit a larger increase in stocks

[6] The economic magnitude is computed as 0.033*(50.787-39.871), where 50.787 is the 75th percentile of the ESG score, 39.871 is the 25th percentile, and the average change in position is 0.102.

with high *Effective ESG Score* during the first nine months after the introduction of the globe ratings. This indicates that our findings are driven by actively-managed funds.

Index funds also increase their positions and contribute to amplifying the buying pressure because stocks with high *Effective ESG Score*, as we show below, appreciate, and hence, receive a larger weight in the indexes.

3.2 Stock-level Consequences

To identify the buying pressure generated by the funds' objective to obtain higher sustainability ratings ex-post, we consider the abnormal trading of funds that end up improving their globe ratings in comparison to other funds. We do so, instead of merely considering the stocks' sustainability ratings, because funds pursue different strategies and select stocks that can contribute to improving their globe ratings within their mandate.

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

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

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 held 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 end up improving 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 funds with strong incentives to improve their globe ratings, defined as funds in a ±2.5% neighborhood of the portfolio sustainability score cutoffs for the bottom and top globe ratings.

Table 3 shows that according to both the ex-post and ex-ante definitions, the trading of the funds that end up improving or 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 pressure, the average abnormal ESG trading in stock *i* is about 7% of the average total trading of mutual funds during the 18-month sample period (column 1).[7] This magnitude could potentially affect stock prices.

Importantly, this pattern is driven by the first nine months after the introduction of the portfolio sustainability ratings. 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. This is consistent with our findings in Table 2 that after the initial period, funds stop targeting improvements in their sustainability ratings.

[7] This economic magnitude is calculated as the coefficient in column 1 (0.0000895), divided by the average total trading of mutual funds as a percent of shares outstanding (0 .0013175).

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 and largely absent in the second half.

Table 4 presents similar results controlling for a number of stock characteristics. We find that the effect of a stock's *Effective ESG Score* on aggregate abnormal ESG trading is economically significant; for instance, in column 1, a one-standard-deviation increase in a stock's ESG score (=8.67) explains about 18% of the mutual funds' total abnormal trading in the stock, calculated as (0.268*8.67)/(0.0013175*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 pressure generated 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 indeed create demand pressure, we should observe that the stocks that they purchase to a larger extent than other funds become overvalued, while the contrary should be the case for the stocks that they sell.

To evaluate whether this is the case, 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, we lose the first quarter of the sample. 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 (in columns 1 and 3, respectively). The annualized return of the strategy is 7.6% (=0.030*252), when considering equally-weighted portfolios (column 1). The annualized return is slightly lower (5.3%) and less statistically significant when considering value-weighted portfolios (column 3), possibly indicating that 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 ESG selling pressure. 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' behavior only in the immediate aftermath of their introduction.

Thus, the return of the long-short strategy appears to decline over time and even changes sign in the second half of the sample period, when selling stocks experiencing high ESG buying

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

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 aim to improve their sustainability ratings exploit the trading of ESG-driven funds. We include in the sample 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.

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 ratings. 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 -0.22% of the funds' TNA, calculated as the coefficient in column 2, multiplied by the standard deviation of the abnormal ESG trading (-0.675*0.0032).

This result is obtained controlling for the selling pressure generated by the funds' purchasing and selling behavior that is unrelated to ESG considerations. Not only do we include interactions of fund and time fixed effects in all specifications to control for shocks to a fund's net assets under management, but we also control for the flow-driven aggregate change in the shares held by mutual funds as a proportion of the stock's shares outstanding (Coval and Stafford, 2007). In this way, we can distinguish buying and selling pressure generated by ESG trading from flow-driven changes in mutual funds' positions.

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 ESG abnormal 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 active 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. In column 5, we find a small but statistically significant effect for index funds, suggesting that these funds increase their holdings in stocks experiencing high ESG demand pressure to a lesser extent than funds pursuing star ratings. Overall, this evidence is consistent with our conjecture that the strategic behavior of active funds drives our estimates.

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 Tcak, 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 Tcak, 2008).

Consistent with our conjecture, Panel B shows that funds that are closer to the cutoffs for improving their star ratings 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 ±5% of the percentile ranking cutoff (column 2), and funds that are within ±2.5% of this cutoff (column 3). Once again, the effect is driven by the first nine

months after the introduction of the globe ratings, as indicated by the negative coefficient on the interaction between the *First 9 months* dummy and *Abnormal ESG Trading*.

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 include 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 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:

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

where $Pressure\ Trade\ (f,i,t)$ equals $Position\ Change(f,i,t)$ 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 (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 $ESG\ Pressure\ Trade$ 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 positions.

By construction, funds that purchase stocks with aggregate abnormal ESG trading pressure (that is, the stocks bought by the funds that end up improving their sustainability scores) should have a higher likelihood to improve their globe ratings. More interestingly, we explore how pursuing a strategy that aims to improve the fund's sustainability rating affects its performance rating.

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. Notably, these funds are also more likely to experience a downgrade of their star ratings, indicating that there is a tradeoff between sustainability and performance ratings. The estimates also imply that funds that trade against sustainability-driven funds and thus experience negative 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 appear to have become overvalued, but is not present afterwards.

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 $ESG\ Pressure\ Trade\ (f,t)$ and a number of controls. 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 $ESG\ Pressure\ Trade$ is associated with an increase in the fund's alpha by 0.083%, equivalent to a 67.7% 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 period 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). Based on these considerations, funds' trading strategies should aim to maximize net flows, which are known to be affected by the funds' performance as well as by the funds' 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 and other funds strive for better performance ratings.

Table 9 explores to what extent this is the case. It appears 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), without controlling for the funds' star ratings, and in Panel B, where we consider dichotomous variables for each of the star ratings, using the middle globe/star ratings as the omitted variables.

As is evident from columns 2 and 5 of Panel A and column 2 of Panel B, in the first nine months of the sample period, the top globe rating is associated with higher flows, while funds with the bottom globe rating experience outflows. However, a comparison of the coefficients on the globe and star ratings in column 2 of Panel B shows that the star ratings have larger effects on flows than the corresponding globe ratings. 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, having a globe rating of 5 increases fund flows by 0.2%, whereas having a star rating of 1 reduces flows by 0.6%. In contrast, having a globe rating of 1 decreases flows by 0.2%, but a star rating of 5 increases flows by 1.6%.

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. 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.

Consistent with this interpretation, the globe ratings appear to leave flows unaffected in the second half of the sample and when we consider the whole 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 retail investors redeem capital from funds with the bottom globe ratings and institutional investors allocate capital to funds with the top globe ratings, 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 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 an interpretation 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 likely 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 no 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 the 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.

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). 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 the 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 efficacy of the sustainability ratings. Columns 1 and 2 of Table 12 show that the globe ratings 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 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 a portfolio aligned with a transition to a low carbon economy. In column 3, we find no evidence that this new measure affected fund flows, supporting our interpretation that when evaluating the tradeoff between sustainability and performance, mutual fund managers and their investors overwhelmingly chose 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
Panel A: Fund Trading	
Trading	The trading in stock i of fund f in quarter t, defined as: $Trading(f,i,t) = \frac{NumShares(f,i,t) - NumShares(f,i,t-1)}{Shares\ Outstanding(i,t-1)}$
Abnormal Trading	The abnormal stock 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.
Abnormal ESG Trading	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: $Agg\ Abnormal\ ESG\ \ Trading(i,t) = \ \sum_{f=1}^{F} Abnormal\ Trading(f,i,t),\ \ if\ f\ \in G$ 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 ±2.5% of the bottom and top rating cutoffs.
Effective ESG Score	The normalized company-level ESG score minus a Sustainalytics controversy deduction. The company-level ESG score is normalized using a z-score transformation within each company's peer group. The Sustainalytics controversy deduction is based on the following calculation: Score 0: Deduction 0; Score 1: Deduction 0.2; Score 20: Deduction 4; Score 50: Deduction 10; Score 80: Deduction 16; Score 100: Deduction 20. Morningstar's Portfolio Sustainability Score is based on the weighted average of the stocks' effective scores, with the funds' portfolio shares as weights.
ESG Pressure Trading	Defined as the weighted average (using portfolio shares as weights) of a fund's positive position changes in quarter t in a stock that belongs to the top quintile of Abnormal ESG Trading and the fund's negative position changes in quarter t in a stock that belongs to the bottom quintile of Abnormal ESG Trading.
Position Change	The position change in stock i of fund f in quarter t, defined as: $Position\ Change(f,i,t) = \frac{Price(i,t-1) * (NumShares(f,i,t) - NumShares(f,i,t-1))}{TNA(f,t-1)}$
Total Trading (% Shares Outstanding)	The total trading in stock i and quarter t is the aggregate stock trading across all funds between quarters t-1 and t, as a percentage of shares outstanding.
Total Trading (% TNA)	For fund f in quarter t, total trading is the aggregate position change between quarters t-1 and t across all stock holdings.

Panel B: Fund Characteristics	
Flow (% TNA)	A fund's quarterly flows, defined as $Flows_{j,q} = \frac{AUM_{j,q} - AUM_{j,q-1} \times (1+R_{j,q})}{AUM_{j,q-1}}$.
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 assigned absolute category ranks and percent ranks 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.
Panel C: Stock Characteristics	
Monthly Abnormal Return	A firm's monthly abnormal returns, 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 and a stock's *Effective ESG Score*. *Abnormal ESG Trading* pressure is the abnormal trading 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 reports results for the first half of the sample period (from March to December 2016), whereas the bottom plot reports results for the second half of the sample period (from January to September 2017).

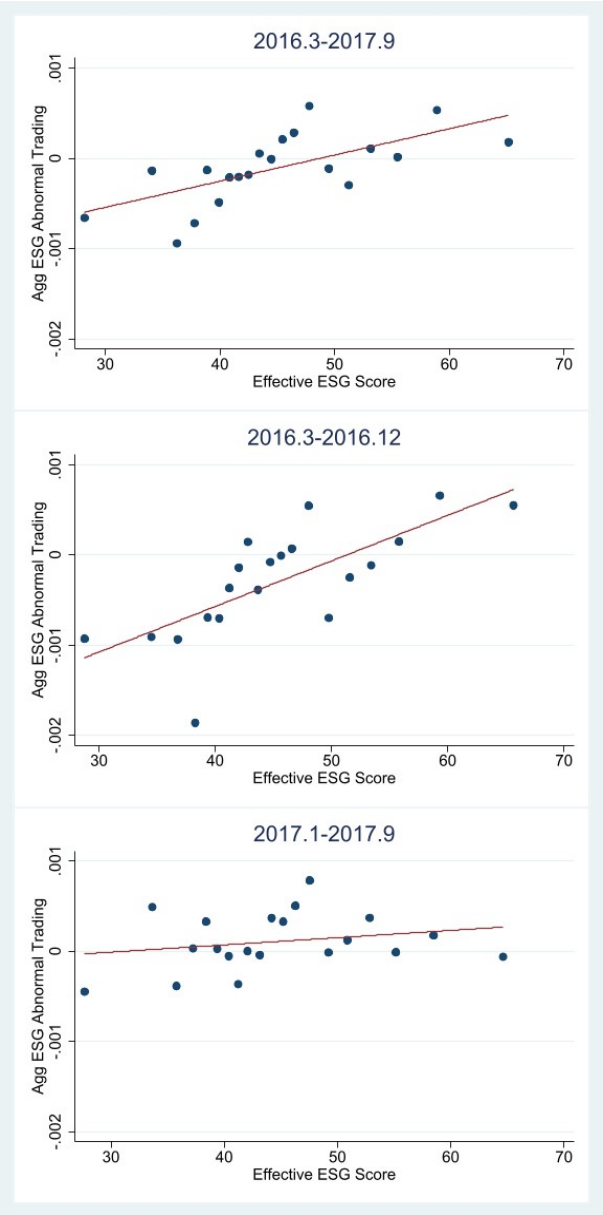

Table 1. Summary statistics

This table reports summary statistics of mutual fund characteristics (Panel A), stock characteristics (Panel B), Morningstar ratings and other fund characteristics (Panel C), and 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	10th pctl	Median	90th pctl
Panel A: Fund (Monthly)						
Flow (% TNA)	34,771	-0.005	0.038	-0.030	-0.006	0.019
Ln TNA	34,771	19.950	1.911	17.360	20.090	22.370
Fund Age	34,787	5.149	0.706	4.078	5.288	5.897
Ret	34,787	1.640	2.686	-1.298	1.301	5.345
Expense Ratio	34,721	1.080	0.559	0.480	1.020	1.660
Star Rating	32,836	3.212	1.019	2	3	4
Globe Rating	31,103	2.980	1.114	1	3	4
Δ Star Rating	32,706	-0.003	0.368	0	0	0
Δ Globe Rating	29,327	0.003	0.482	0	0	1
Globe Downgrade	29,327	0.098	0.297	0	0	0
Globe Upgrade	29,327	0.105	0.306	0	0	1
Star Downgrade	32,706	0.068	0.252	0	0	0
Star Upgrade	32,706	0.065	0.246	0	0	0
Panel B: Stock (Quarterly)						
Abnormal ESG Trading (x10000)	21,456	-0.895	38.240	-21.910	0.000	20.980
Total Trading (% Shares Outstanding)	21,456	0.001	0.022	-0.012	0.000	0.013
Effective ESG Score	6,580	45.067	8.675	35.204	43.925	56.970
Ln Market Cap	21,456	13.680	2.048	11.000	13.680	16.380
Book to Market	20,551	0.513	0.521	0.078	0.429	1.070
ROA	20,010	0.008	0.060	-0.052	0.020	0.055
Ret	20,501	0.057	0.223	-0.175	0.036	0.293
Leverage	20,615	0.246	0.271	0.000	0.193	0.545
Sales Growth Rate	19,926	0.059	0.293	-0.130	0.025	0.230
Panel C: Fund (Quarterly)						
ESG Pressure Trading	9,983	0.045	0.048	0.006	0.031	0.096
Total Trading (% TNA)	10,893	0.161	0.159	0.025	0.125	0.315
Panel D: Fund-Stock (Quarterly)						
Position Change	1,966,535	0.0013	0.213	-0.079	0	0.077

Table 2. Trading and stock ESG ratings

This table reports the relation between a fund's 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. Columns (1)-(5) include all U.S. domiciled U.S. equity funds; columns (6)-(7) exclude index funds. Column (1) shows results for the full sample period from March 2016 to September 2017. Columns (2), (4)-(5), and (6)-(7) report results for the first nine months (March – December 2016), whereas column (3) reports results for the second nine months (January – September 2017). *Few Peers* and *Many Peers* refer to the fund's peers in the same Morningstar category. All specifications include lagged firm-level controls and fund-by-year-quarter fixed effects. Standard errors are clustered at the fund level.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Position Change *(f,i,t)*						
	All Funds					*Excluding Index Funds*	
	2016.3-2017.9	2016.3-2016.12	2017.1-2017.9	2016.3-2016.12		2016.3-2016.12	
				Few Peers	Many Peers	Few Peers	Many Peers
Effective ESG Score	0.001	0.001	0.003	-0.017**	0.010**	-0.021**	0.021***
	(0.455)	(0.226)	(0.635)	(-2.180)	(2.132)	(-2.303)	(2.640)
Border Funds # Effective ESG Score	0.029**	0.033*	0.025	0.062**	0.014	0.068**	0.004
	(2.203)	(1.769)	(1.379)	(2.386)	(0.648)	(2.185)	(0.126)
Ln Market Cap	0.127	0.221**	0.019	0.344**	0.038	-0.055	-0.208**
	(1.393)	(2.095)	(0.195)	(2.037)	(0.321)	(-0.460)	(-2.186)
Book to Market	-0.041	-0.029	-0.333**	0.084	-0.264	-0.278	-0.070
	(-0.329)	(-0.177)	(-2.086)	(0.269)	(-1.357)	(-0.946)	(-0.287)
Leverage	-0.259*	-0.740***	0.088	-0.271	0.615**	-0.450	-1.342***
	(-1.818)	(-3.672)	(0.448)	(-0.804)	(2.330)	(-1.143)	(-3.778)
ROA	-6.872***	-7.590***	-5.056***	-14.642***	-1.314	-18.587***	-5.259*
	(-5.226)	(-4.109)	(-2.914)	(-4.715)	(-0.628)	(-4.934)	(-1.750)
Sales Growth Rate	0.968***	0.822***	1.115***	1.555***	1.375***	2.056***	0.112
	(5.824)	(3.707)	(4.756)	(4.020)	(4.477)	(4.261)	(0.277)
Ret (t-1)	-3.579***	-1.264***	-7.049***	-4.694***	-3.307***	-5.412***	3.540***
	(-8.591)	(-2.676)	(-14.415)	(-6.310)	(-5.995)	(-5.805)	(4.295)
Total Trading (% Shares Outstanding)	0.906***	0.964***	0.802***	1.126***	0.907***	1.219***	1.014***
	(30.964)	(37.445)	(17.281)	(24.064)	(12.631)	(22.879)	(-25.479)
Constant	-1.609	-3.340*	0.585	-4.450	-1.211	0.927	1.966
	(-1.065)	(-1.901)	(0.358)	(-1.567)	(-0.620)	(0.463)	(1.194)
Observations	884514	459257	425257	204258	247593	159351	161594
Adjusted R-squared	0.225	0.224	0.225	0.245	0.151	0.160	0.161
Fixed effects	Fund*YQ	Fund*YQ	Fund*YQ	Fund*YQ	Fund*YQ	Fund*YQ	Fund*YQ

Table 3. Sustainability ratings and funds' incentives

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 ±2.5% of the portfolio ESG score ranking cutoffs for globe ratings between 1 and 2 or 4 and 5. *Ex-post Abnormal ESG Trading* pressure is the aggregate abnormal trading by funds with improved globe ratings between quarters *t-1* and *t*. *Abnormal ESG Trading* pressure is multiplied by 10000 in the table below. 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)
Ex-post Definition	2016.3-2017.9	2016.3-2016.12	2017.1-2017.9
Abnormal ESG Trading	-0.895	-2.2077	0.262
t-stat	-3.4627	-5.1123	0.804
Ex-ante 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. Trading pressure and stock ESG ratings

This table reports the relation between *Abnormal ESG Trading* pressure and a stock's *Effective ESG Score*. *Abnormal ESG Trading* pressure is the abnormal trading across all funds that improve their globe ratings between quarters *t-1* and *t*. *Effective ESG Score* is a firm-level ESG score, as reported by Sustainalytics. 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), whereas 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 industry-by-year-quarter 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	0.268***	0.464***	0.064	0.057
	(3.805)	(3.684)	(0.967)	(0.847)
Effective ESG Score # First 9 mo				0.416***
				(2.921)
Ln Market Cap	-0.119	0.013	-0.235	-0.149
	(-0.303)	(0.021)	(-0.506)	(-0.379)
Book to Market	-1.822	-4.877	2.740	-1.730
	(-0.873)	(-1.555)	(1.368)	(-0.833)
Leverage	-3.036	-4.275	-1.991	-3.054
	(-0.823)	(-0.685)	(-0.553)	(-0.828)
ROA	16.166	6.090	31.845	16.449
	(0.567)	(0.127)	(1.036)	(0.576)
Sales Growth Rate	0.007	1.457	-2.214	0.140
	(0.003)	(0.474)	(-0.566)	(0.058)
Ret (t-1)	2.204	6.474	-4.156	2.375
	(0.433)	(0.884)	(-0.743)	(0.467)
Constant	-9.166	-20.133*	1.411	-9.124
	(-1.263)	(-1.796)	(0.165)	(-1.259)
Observations	5846	3058	2788	5846
Adjusted R-squared	0.003	-0.004	0.028	0.004
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 and shorting stocks with positive sustainability-driven trading pressure. The portfolio is rebalanced at the end of each quarter. Columns (1) and (3) show results for the six months from July 2016 through December 2016. Columns (2) and (4) report results for the nine months from January 2017 through September 2017. 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)	(3)	(4)
	2016.7-2016.12	2017.1-2017.9	2016.7-2016.12	2017.1-2017.9
	Equal-weighted		Value-weighted	
Mkt-RF	-0.149***	-0.070***	-0.006	-0.043
	(-12.716)	(-3.156)	(-0.169)	(-1.557)
SMB	-0.101***	-0.039	-0.092**	0.043
	(-4.967)	(-1.155)	(-2.473)	(0.913)
HML	-0.142***	-0.044***	-0.059**	0.028
	(-3.970)	(-3.567)	(-2.203)	(1.627)
Mom	-0.107***	0.030	-0.053	0.016
	(-3.808)	(1.566)	(-0.802)	(0.445)
Alpha	0.030***	-0.005	0.021*	-0.020
	(2.767)	(-0.636)	(1.658)	(-1.593)
Observations	127	188	127	188
R-squared	0.553	0.222	0.097	0.032

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, excluding those with improved globe ratings in the quarter. Columns (5) and (6) separate U.S. equity funds into index and active 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), whereas 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 with the same investment style. Odd-numbered columns report results for the first half of the sample period; even-numbered columns report results for the second half of the sample period. All specifications include fund-by-year-quarter 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 by U.S. equity funds (excluding funds with improved globe ratings)

	(1)	(2)	(3)	(4)	(5)	(6)
	Position Change *(f,i,t)*					
	All funds				*Index Funds*	*Active Funds*
	2016.3-2017.9	2016.3-2016.12	2017.1-2017.9	2016.3-2017.9	2016.3-2016.12	
Abnormal ESG Trading	-0.383***	-0.675***	0.094	0.092	-0.128*	-0.964***
	(-5.996)	(-8.034)	(1.212)	(1.170)	(-1.688)	(-8.017)
First 9 months dummy # Abnormal ESG Trading				-0.768***		
				(-7.183)		
Total Trading (% Shares Outstanding)	0.772***	0.769***	0.781***	0.773***	0.419***	0.930***
	(26.918)	(29.074)	(18.963)	(26.964)	(15.002)	(27.089)
Constant	0.001***	-0.001***	0.004***	0.001***	0.018***	-0.011***
	(51.467)	(-26.768)	(28.218)	(48.478)	(396.323)	(-206.509)
Observations	1809124	960270	848854	1809124	329971	630299
Adjusted R-squared	0.239	0.246	0.229	0.239	0.540	0.186
Fixed effects	Fund*YQ	Fund*YQ	Fund*YQ	Fund*YQ	Fund*YQ	Fund*YQ

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

	(1)	(2)	(3)
	Position Change *(f,i,t)*		
	Other	Within ±5%	Within ±2.5%
Abnormal ESG Trading	0.199*	-0.021	-0.008
	(1.962)	(-0.120)	(-0.050)
First 9 months dummy # Abnormal ESG Trading	-0.624***	-0.680**	-1.012***
	(-4.409)	(-2.443)	(-4.811)
Total Trading (% Shares Outstanding)	0.627***	0.826***	0.924***
	(17.814)	(16.977)	(23.259)
Constant	0.009***	-0.000*	-0.008***
	(250.337)	(-1.746)	(-192.307)
Observations	865230	335510	608384
Adjusted R-squared	0.287	0.247	0.181
Fixed effects	Fund*YQ	Fund*YQ	Fund*YQ

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

	(1)	(2)	(3)	(4)	(5)	(6)
	Position Change *(f,i,t)*					
	2016.3-2016.12	2017.1-2017.9	2016.3-2016.12	2017.1-2017.9	2016.3-2016.12	2017.1-2017.9
	All Funds		*Below-Median Peers*		*Above Median-Peers*	
Abnormal ESG Trading	-0.371***	0.208*	-0.655***	-0.167	0.042	0.704***
	(-3.307)	(1.787)	(-4.184)	(-0.981)	(0.287)	(4.463)
Within ±5% of Rating Cutoff # Abnormal ESG Trading	-0.523***	-0.242	-0.528**	-0.329	-0.477*	0.328
	(-3.133)	(-1.415)	(-2.382)	(-1.420)	(-1.908)	(1.257)
Total Trading (% Shares Outstanding)	0.792***	0.818***	0.922***	0.834***	0.689***	0.787***
	(28.108)	(18.365)	(21.137)	(15.028)	(19.499)	(10.728)
Constant	-0.008***	0.000***	-0.007***	0.002***	-0.009***	-0.002***
	(-170.264)	(2.952)	(-94.198)	(8.363)	(-152.072)	(-9.301)
Observations	855394	775733	512734	454510	342660	321223
Adjusted R-squared	0.205	0.196	0.228	0.230	0.166	0.140
Fixed effects	Fund*YQ	Fund*YQ	Fund*YQ	Fund*YQ	Fund*YQ	Fund*YQ

Table 7. Sustainability-driven trading pressure and trading of funds pursuing star ratings (ex-ante analysis)

This table reports the effects of sustainability-driven trading pressure on the funds with stronger incentives to pursue higher performance ratings. Column 1 reports the trading of funds within ±2.5% of the star rating cutoffs, column 2 includes funds within ±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 fund-by-year-quarter fixed-effects. Standard errors are clustered at the fund level.

	(1)	(2)	(3)
	Position Change *(f,i,t)*		
	Within ±2.5%	Within ±5%	Other
Abnormal ESG Trading (ex-ante)	0.279**	0.067	0.064
	(2.022)	(0.455)	(0.670)
First 9 months dummy # Abnormal ESG Trading (ex-ante)	-2.084***	-1.495***	-1.406***
	(-7.097)	(-3.890)	(-7.166)
Constant	-0.007***	0.001***	0.009***
	(-467.212)	(28.599)	(1204.445)
Observations	608384	335510	865230
Adjusted R-squared	0.167	0.236	0.280
Fixed effects	Fund*YQ	Fund*YQ	Fund*YQ

Table 8. Tradeoff between star and globe ratings

Panel A of this table reports the tradeoff between star and globe ratings. For each fund in each quarter, we rank the position change (as a percentage of TNA) into quintiles. We then identify *ESG Pressure Trading* as the purchase of a stock with sustainability-driven trading pressure (top quintile of *Abnormal ESG Trading*) or the selling of a stock from the bottom quintile of *Abnormal ESG Trading*. Then, we aggregate all the pressure trading for each fund in each quarter *t*, and estimate (at the fund level) the relationship between the star/globe rating changes and *ESG Pressure Trading* in the previous quarter. Column 3 reports results for the first half of the sample period (from March to December 2016), whereas column 4 reports results for the second half of the sample period (from January to September 2017). Panel B reports the relationship between funds' abnormal returns and *ESG Pressure Trading*. 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 investment style-by-year-quarter 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	1.398***	-0.094	-0.401***	0.067
	(11.682)	(-1.089)	(-2.748)	(0.614)
Total Trading (% TNA)	-0.376***	-0.016	0.076*	-0.062*
	(-9.746)	(-0.625)	(1.670)	(-1.959)
One Star (t-1)	-0.021	0.171***	0.207***	0.145***
	(-1.350)	(10.763)	(8.759)	(8.041)
Two Star (t-1)	-0.004	0.086***	0.103***	0.075***
	(-0.408)	(8.055)	(6.726)	(6.338)
Four Star (t-1)	0.005	-0.086***	-0.104***	-0.076***
	(0.748)	(-9.913)	(-8.162)	(-7.765)
Five Star (t-1)	0.026**	-0.216***	-0.241***	-0.201***
	(2.410)	(-17.197)	(-13.709)	(-14.094)
One Globe (t-1)	0.202***	0.005	-0.001	0.007
	(14.473)	(0.581)	(-0.048)	(0.699)
Two Globe (t-1)	0.100***	0.002	0.010	-0.002
	(8.415)	(0.386)	(1.004)	(-0.338)
Four Globe (t-1)	-0.104***	0.008	0.029***	-0.003
	(-8.711)	(1.472)	(2.791)	(-0.519)
Five Globe (t-1)	-0.164***	-0.006	-0.005	-0.006
	(-11.392)	(-0.668)	(-0.353)	(-0.599)
Flow (t-1)	-0.006	0.643***	0.856***	0.504***
	(-0.058)	(8.377)	(6.278)	(5.659)
Ret(t-1)	-0.003	0.005**	0.010**	0.001
	(-1.124)	(2.107)	(2.555)	(0.428)
Ln TNA (t-1)	0.001	0.020***	0.022***	0.018***
	(0.491)	(13.463)	(9.174)	(10.904)
Age	0.009*	-0.011***	-0.008	-0.014***
	(1.803)	(-2.730)	(-1.191)	(-2.898)
Constant	-0.046	-0.343***	-0.399***	-0.304***
	(-1.147)	(-11.938)	(-8.383)	(-9.100)
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)
	Abnormal returns		
	2016.3 - 2017.9	2016.3-2016.12	2017.1 - 2017.9
ESG Pressure Trading	-0.320	-1.666***	0.359
	(-1.093)	(-3.336)	(1.091)
Total Trading (% TNA)	0.069	0.546***	-0.223**
	(0.833)	(3.752)	(-2.375)
Flow (t-1)	0.039	0.358	-0.020
	(0.206)	(1.022)	(-0.088)
Ln TNA (t-1)	0.018***	0.038***	0.006
	(3.791)	(5.081)	(1.121)
Age	-0.035***	-0.059***	-0.022*
	(-3.369)	(-3.461)	(-1.947)
Exp Ratio (t-1)	0.006	0.009	-0.002
	(0.596)	(0.865)	(-0.163)
Ret(t-1)	-0.025***	0.011	-0.061***
	(-3.234)	(1.058)	(-5.390)
Ret(t-12,t-1)	-0.006***	-0.026***	0.006**
	(-2.935)	(-7.166)	(2.312)
Constant	-0.267***	-0.664***	-0.149
	(-2.661)	(-4.381)	(-1.313)
Observations	25327	9966	15361
Adjusted R-squared	0.178	0.181	0.183
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 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 (from March to December 2016), whereas columns 3 and 6 report results for the second half of the sample period (from January to September 2017). Columns 1–3 use globe 3 as the baseline; 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, respectively. All specifications include lagged controls for the fund's star rating, flows, returns, size, age, and expense ratio as well as investment category-by-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. Globe ratings and fund flows

	(1)	(2)	(3)	(4)	(5)	(6)
	Flow (% 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	-0.001	-0.002**	0.000	-0.001	-0.002**	0.000
	(-0.994)	(-2.022)	(0.273)	(-1.362)	(-2.333)	(0.061)
Two Globe	-0.000	-0.001	0.000			
	(-0.013)	(-0.760)	(0.549)			
Four Globe	0.001	0.001	0.000			
	(1.224)	(1.305)	(0.531)			
Five Globe	0.002**	0.002**	0.001	0.002**	0.002**	0.001
	(2.066)	(1.984)	(1.228)	(2.001)	(2.021)	(1.102)
Observations	27579	12326	15253	27579	12326	15253
Adjusted R-squared	0.173	0.186	0.165	0.173	0.186	0.165
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)
	Flow (% TNA)		
	2016.3-2017.9	2016.3-2016.12	2017.1-2017.9
One Globe	-0.001	-0.002*	-0.000
	(-1.242)	(-1.940)	(-0.135)
Two Globe	0.000	-0.001	0.000
	(0.080)	(-0.723)	(0.589)
Four Globe	0.001	0.001	0.000
	(1.267)	(1.460)	(0.427)
Five Globe	0.002**	0.002**	0.001
	(2.025)	(2.134)	(1.012)
One Star	-0.007***	-0.006***	-0.007***
	(-5.830)	(-4.543)	(-4.498)
Two Star	-0.004***	-0.004***	-0.005***
	(-6.818)	(-4.949)	(-5.610)
Four Star	0.006***	0.007***	0.006***
	(11.317)	(9.186)	(8.718)
Five Star	0.016***	0.016***	0.016***
	(13.400)	(11.749)	(10.852)
Observations	27658	12360	15298
Adjusted R-squared	0.174	0.186	0.166
Controls	Yes	Yes	Yes
Fixed effects	Cat*YM	Cat*YM	Cat*YM

Panel C. Institutional and retail share classes

	(1)	(2)	(3)	(4)	(5)	(6)
	Institutional Shares			Retail Shares		
	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	0.000	-0.002	0.002	-0.002*	-0.003**	-0.001
	(0.049)	(-1.099)	(0.919)	(-1.689)	(-2.406)	(-0.562)
Two Globe	0.000	0.000	0.001	0.001	-0.001	0.002**
	(0.460)	(0.211)	(0.405)	(0.949)	(-0.930)	(2.084)
Four Globe	0.002	0.003*	0.001	-0.000	0.000	-0.000
	(1.525)	(1.751)	(0.587)	(-0.114)	(0.403)	(-0.600)
Five Globe	0.004**	0.004*	0.004	-0.000	0.002	-0.003*
	(2.225)	(1.880)	(1.566)	(-0.458)	(1.580)	(-1.885)
One Star	-0.016***	-0.017***	-0.016***	-0.007***	-0.006***	-0.007***
	(-6.393)	(-4.482)	(-4.986)	(-5.539)	(-4.892)	(-4.195)
Two Star	-0.009***	-0.007***	-0.010***	-0.005***	-0.006***	-0.005***
	(-6.476)	(-4.061)	(-5.523)	(-8.377)	(-7.979)	(-5.558)
Four Star	0.008***	0.010***	0.007***	0.007***	0.008***	0.007***
	(7.763)	(7.532)	(4.910)	(10.533)	(8.590)	(8.200)
Five Star	0.025***	0.028***	0.022***	0.019***	0.021***	0.016***
	(11.682)	(10.905)	(9.228)	(10.395)	(8.940)	(8.610)
Observations	23099	10050	13049	60395	27238	33157
Adjusted R-squared	0.113	0.144	0.093	0.103	0.114	0.097
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 fund flows. Column 1 presents results for the full sample period; column 2 reports results for the first half of the sample period (from March to December 2016); 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 star rating, flows, returns, size, age, and expense ratio as well as investment category-by-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	-0.000	-0.001
	(-1.422)	(-0.462)	(-1.464)
Globe Upgrade	-0.001	-0.001	-0.001
	(-1.291)	(-0.797)	(-0.996)
Star Downgrade	-0.003***	-0.003***	-0.003***
	(-3.882)	(-2.800)	(-2.736)
Star Upgrade	0.002***	0.003***	0.002*
	(3.216)	(2.779)	(1.778)
One Globe (t-1)	-0.000	-0.001	0.001
	(-0.050)	(-1.224)	(0.982)
Two Globe (t-1)	0.000	-0.000	0.000
	(0.127)	(-0.152)	(0.278)
Four Globe (t-1)	0.001	0.001	0.000
	(1.334)	(1.322)	(0.567)
Five Globe (t-1)	0.002*	0.003**	0.000
	(1.806)	(2.325)	(0.351)
One Star (t-1)	-0.008***	-0.008***	-0.008***
	(-6.722)	(-5.399)	(-5.159)
Two Star (t-1)	-0.005***	-0.005***	-0.004***
	(-7.182)	(-6.141)	(-4.841)
Four Star (t-1)	0.006***	0.007***	0.006***
	(11.049)	(9.057)	(8.620)
Five Star (t-1)	0.016***	0.017***	0.015***
	(13.106)	(11.128)	(10.923)
Observations	27601	12339	15262
Adjusted R-squared	0.165	0.186	0.148
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 effects of sustainability scores on fund flows. Column (1) shows results for the full sample period from March 2016 through September 2017. Column (2) reports results from March 2016 through December 2016, whereas column (3) reports results from January 2017 to September 2017. All specifications include lagged controls for the fund's star rating, flows, returns, size, age, and expense ratio as well as investment category-by-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
Portfolio Sustainability Score	0.000***	0.001***	0.000
	(2.766)	(3.473)	(0.827)
One Star (t-1)	-0.008***	-0.007***	-0.008***
	(-6.458)	(-4.882)	(-5.318)
Two Star (t-1)	-0.004***	-0.004***	-0.005***
	(-6.552)	(-4.741)	(-5.013)
Four Star (t-1)	0.006***	0.006***	0.007***
	(10.969)	(8.239)	(8.920)
Five Star (t-1)	0.016***	0.016***	0.016***
	(12.623)	(10.964)	(10.303)
Ret (t-1)	0.002***	0.001***	0.002***
	(8.066)	(5.820)	(6.376)
Ln TNA (t-1)	-0.001***	-0.001***	-0.001***
	(-7.306)	(-5.697)	(-6.201)
Age	-0.002***	-0.001*	-0.003***
	(-4.759)	(-1.738)	(-5.611)
Exp Ratio	-0.001*	-0.000	-0.002***
	(-1.793)	(-0.126)	(-2.792)
Flow (t-1)	0.309***	0.333***	0.290***
	(12.692)	(10.551)	(10.379)
Constant	0.007	-0.009	0.022**
	(0.812)	(-0.796)	(2.049)
Observations	27579	12326	15253
Adjusted R-squared	0.158	0.170	0.150
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 star ratings, globe ratings, and *Low Carbon Designation* on fund flows after Morningstar modified its globe rating methodology in November 2018. Column (1) uses globe 3 as the baseline, whereas column (2) uses the middle three globe ratings as the baseline. In column (3), we examine the effects of a different sustainability rating, Morningstar's *Low Carbon Designation*. All specifications include lagged controls for the fund's star rating, flows, returns, size, age, and expense ratio as well as investment category-by-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)		
	2018.11 - 2019.9		
One Globe	-0.001	-0.002	-0.001
	(-0.953)	(-1.639)	(-0.535)
Two Globe	0.001		
	(1.641)		
Four Globe	0.001		
	(1.613)		
Five Globe	0.001	0.000	
	(0.696)	(0.145)	
Low Carbon Designation			-0.001
			(-0.535)
One Star (t-1)	-0.005***	-0.005***	-0.005***
	(-4.078)	(-3.803)	(-4.113)
Two Star (t-1)	-0.002***	-0.002***	-0.002***
	(-2.718)	(-2.661)	(-2.889)
Four Star (t-1)	0.007***	0.007***	0.008***
	(11.060)	(11.004)	(10.781)
Five Star (t-1)	0.019***	0.019***	0.020***
	(13.171)	(13.010)	(13.121)
Observations	17236	17116	17696
Adjusted R-squared	0.179	0.178	0.165
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	
	Upgrade	*Downgrade*	*Upgrade*	*Downgrade*
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 ratings and performance ratings on 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 from March 2016 to December 2016, whereas columns (3) and (6) report results from January 2017 to September 2017. All specifications include lagged controls for the fund's star rating, flows, returns, size, age, and expense ratio as well as investment category-by-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)
	Flow (% 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	-0.000	-0.004	0.004			
	(-0.181)	(-1.384)	(0.903)			
Five Globe # Star Downgrade	0.003	0.008	-0.001			
	(1.272)	(1.644)	(-0.201)			
Star Downgrade	-0.003***	-0.004***	-0.003**			
	(-3.673)	(-3.444)	(-2.011)			
Monthly Return				0.001**	0.000*	0.001
				(2.545)	(1.669)	(1.569)
One Globe # Return				-0.000	-0.000	0.001
				(-0.095)	(-0.867)	(1.537)
Five Globe # Return				0.000	-0.000	0.001
				(0.280)	(-0.070)	(0.640)
One Globe	-0.001	-0.001	-0.000	-0.001	-0.001	-0.001
	(-0.964)	(-1.270)	(-0.185)	(-0.765)	(-1.111)	(-0.610)
Five Globe	0.001	0.001	0.001	0.001*	0.002*	0.001
	(1.478)	(1.338)	(0.939)	(1.662)	(1.793)	(0.454)
Observations	27548	12320	15228	27579	12326	15253
Adjusted R-squared	0.160	0.169	0.154	0.158	0.170	0.151
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 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, created by buying stocks with negative sustainability-driven trading pressure and shorting stocks with positive sustainability-driven trading pressure. The portfolio is rebalanced at the end of each quarter. 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	
	Equal-weighted	Value-weighted
Mkt-RF	-0.163***	-0.068***
	(-7.695)	(-2.659)
SMB	-0.094**	0.035
	(-2.279)	(0.373)
HML	-0.197***	0.014
	(-4.504)	(0.494)
Mom	-0.143***	-0.082
	(-5.145)	(-1.289)
Alpha	0.028**	0.021**
	(2.515)	(2.382)
Observations	85	85
R-squared	0.559	0.137

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