Mutual Fund Tournaments and ESG Rating

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ABSTRACT

We find evidence of an ESG tournament behavior where the Morningstar Sustainability Ratings (expressed as a five-globe system) of mutual funds can be used as a new tool for US equity growth fund managers to compete with peers and attract investors' flows. Past "loser" funds increase the ESG of the stocks in their portfolios to affect the funds' sustainability ratings at the year-end more than past "winners" by selling non-ESG stocks and opening new positions in ESG stocks. Investors respond to the tournament behavior: "losers" with increased globe ratings experience fewer outflows than those without increased globe ratings. We also investigate the relation between window dressing and ESG tournament. We find that window dressing funds do not focus on ESG except for funds close to the four-/five-globe breakpoint. European growth funds also exhibit a tournament on the Morningstar Low Carbon Designation.

JEL Classification: G11 G23 G24 M14

Keywords: Tournament, Mutual Fund, Rating, Fund Flows, Sustainability

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We find evidence of an ESG tournament behavior where the Morningstar Sustainability Ratings (expressed as a five-globe system) of mutual funds can be used as a new tool for US equity growth fund managers to compete with peers and attract investors' flows. Past "loser" funds increase the ESG of the stocks in their portfolios to affect the funds' sustainability ratings at the year-end more than past "winners" by selling non-ESG stocks and opening new positions in ESG stocks. Investors respond to the tournament behavior: "losers" with increased globe ratings experience fewer outflows than those without increased globe ratings. We also investigate the relation between window dressing and ESG tournament. We find that window dressing funds do not focus on ESG except for funds close to the four-/five-globe breakpoint. European growth funds also exhibit a tournament on the Morningstar Low Carbon Designation.

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1. Introduction

In recent years, financial markets experienced a dramatic increase in environmental, social, and governance (ESG) related investing. Especially since the Covid-19 crisis, investors renewed their focus on climate change, urging decision makers to prioritize more sustainable approaches to investment (J. P. Morgan, 2020). A growing share of institutional and individual investors have integrated ESG factors into their investment philosophies across countries and asset classes. Global Sustainable Investment Review 2022 summarizes that USD 30.3 trillion was invested in sustainable and socially responsible investment globally. The mutual fund industry is one important participant in this increasing trend. For example, according to the Investment Company Institute 2023 Fact Book in 2022 there were 881 ESG US-based funds managing $460 billion in assets up from 489 funds managing $276 billion in 2019.[1]

The increase in ESG investing has been mirrored by a surge in research related to ESG both at the stock and fund levels. Despite claims from practitioners that ESG investing can deliver a win-win situation by helping the planet and providing superior financial performance, the academic evidence is more mixed.[2] Theoretically, as discussed by Pastor et al. (2021), green stocks should have lower expected returns than brown stocks due to investors' preference for green stocks and their better hedging properties for climate risk. Empirically, Pastor et al. (2022) show that green stocks delivered high realized returns in recent years due to unexpected increases in

[1] See https://www.icifactbook.org/pdf/2023-factbook.pdf.
[2] For example, Larry Fink the head of BlackRock, the world's largest fund manager, wrote in his 2020 open letter to CEOs that "sustainability- and climate-integrated portfolios can provide better risk-adjusted returns to investors." (see https://www.blackrock.com/corporate/investor-relations/2020-larry-fink-ceo-letter)

environmental concerns. However, measures of expected returns not based on realized returns provide more consistent results with their theory. It is possible that investors may chase good past realized returns or may value the ESG performance.[3] Hartzmark and Sussman (2019) document that following the introduction of fund sustainability ratings provided by Morningstar, investors show positive (negative) flow feedback on funds with high (low) sustainability ratings. Investors clearly pay attention to ESG and ESG/sustainable/responsible investing has been in high demand.[4] In this paper, we focus on whether the increasing and persistent demand for sustainable investing has an impact on fund managers' decisions.[5] In particular, we test whether mutual funds managers conduct a tournament using ESG ratings to compete for fund flows.

Brown et al. (1996) propose that economic incentives and competition among mutual fund managers affect their investment decisions, which might be at the expense of investors' best interests. They view the mutual fund market as a tournament in sports where funds with similar investment objectives and characteristics compete with other funds, where the payoff -- more inflows which generate more management fees -- depends on the performance relative to the peers.

[3] Giglio et al. (2023) study the motives of ESG investing and find that 25% of investors in their sample are primarily motivated by ethical considerations, 22% are driven by climate hedging motives, whereas only 7% are motivated by return expectations. Bauer et al. (2021) find that individual investors in Dutch pension funds support to increase funds' engagement to improve the sustainability of the firms in which the funds invest and invest more in firms with high scores on the four Sustainable Development Goals, even hurt financial benefits. Renneboog et al. (2008) show that flows to socially responsible investing funds are less sensitive to fund performance than conventional funds. Bollen (2007) documents that inflows to socially responsible funds are more sensitive to past positive returns and outflows are less sensitive to past negative returns than to conventional funds.

[4] We treat the terms ESG investing, responsible investing, and Sustainable Responsible Investing (SRI) interchangeably in this paper.

[5] One survey from CFA Institute (www.cfainstitute.org//media/documents/survey/esg-survey-report-2017.pdf) reveals that over 80% of portfolio managers admit that client demand is the main reason for considering ESG issues. Albuquerque et al. (2021) showed that fund managers, especially non-ESG funds, continued to cater to their ESG clients during the Covid-19 stock market crash.

Given that formal reporting and assessment is based on annual performance, funds with poor performance in the first part of the year increase their risk levels in an attempt to improve their rankings and attract fund flows. Chevalier and Ellison (1997) document that a disproportionate amount of investor flows moves toward top-performing funds each year, creating incentives for fund managers to engage in "risk-increasing" tournament to earn flows and eventually higher compensation. Given that Hartzmark and Sussman (2019) show significant investor inflows toward top-sustainability funds, fund managers aiming to maximize compensation may engage in *ESG tournament* (i.e., using ESG as another tool to compete with their peers and earn more flows). Therefore, in this paper we test whether managers with poor performance in the first part of the year tilt their portfolios to increase funds' sustainability ratings at the year-end and attract the flows of ESG investors. This research question is important because this ESG tournament is driven by agency considerations rather than factors related to sustainability concerns, and can result in suboptimal portfolios and in irrational price formation in asset markets (James and Isaac, 2000).

We use the Morningstar's Sustainability Rating (also called "globe" rating) to define the ESG level of funds. Since March 2016, using historical firm-level ESG scores from Sustainalytics, Morningstar published a rating that measures how well a mutual fund in its database performs on ESG relative to its peer group (Morningstar Sustainability Rating Methodology, 2018). Within each Morningstar fund category, funds are ranked into five groups based on their portfolio sustainability score. The best 10 percent of funds in their category are labelled as five globes (high sustainability), whereas the worst 10 percent are labelled as one globe (low sustainability). Hartzmark and Sussman (2019) find that one-globe funds suffer extra outflows, whereas five-globe

funds receive extra inflows, controlling for similar fund performance and characteristics. Based on their study, we expect that funds with below median performance ("losers") in the first part of the year (the interim assessment period) have a higher incentive to trade to improve globe ratings in the rest of the year to attract inflows from ESG investors and attenuate outflows from their poor performance than funds with above median performance ("winners"). "Winners" may also show these incentives, but we expect them to be weaker than "losers" because they already receive higher flows from good performance.

We focus on US and European equity growth funds with Morningstar sustainability ratings assigned from March 2016 to December 2022. There are two main reasons why we focus on growth funds. First, growth funds receive more financial press and retail investor involvement than other funds; they are de facto the most widely followed and often-ranked class. Brown et al. (1996) also focused on growth funds and provided this rational. Second, when we replicate across different fund categories, the results from Hartzmark and Sussman (2019) related to the flow effect of Morningstar sustainability rating, we find that the documented inflow and outflow effects are both present only among growth funds in our sample period.[6]

In our first set of results, we split US and European growth funds into "losers" and "winners" based on the median performance of the funds within the same Morningstar category. We then examine which type of managers are more likely to tilt their portfolios to ESG stocks with the purpose of increasing the globe rating at the year-end. We posit that to attenuate the impact of poor

[6] In particular, one- and two-globe funds suffer from an outflow effect while five-globe funds benefit from an inflow effect among US growth funds. However, when we examine blend and value US funds we find evidence of an inflow effect, although weaker, but not of an outflow effect.

performance on fund flows, “loser” funds have the incentive to avoid extra outflows of low ESG ratings or to earn inflows of high ESG. Following other mutual fund tournament papers (Brown et al., 1996; Hallahan et al., 2008), we focus on the months from March to August as interim assessment months, which implies that managers have from nine to four months left to adjust their portfolios to earn higher globes.

In line with our hypothesis, we find that past “losers” increase the ESG rating more than past “winners”. Furthermore, to investigate the response of fund managers to the outflow effect of low globes, we compare the number of losers and winners who increased from one or two globes at the assessment period to higher globes (three, four, and five globes) at the year-end. The result show that 32% of losers increase to high globes vs. 19% of winners. To test the response of managers to the inflow effect, we compare the number of losers and winners who experience an increase to five globes from other globes at the year-end. The number of past losers with increased to five globes are statistically significantly larger than past winners if the interim assessment occurs before July. Although the response to the inflow effect is weaker than the response to the outflow effect, these results are consistent with managers strategically altering the ESG of the portfolio to avoid outflows due to low ESG ratings or to obtain more inflows by moving to five globes.

To better assess the relation between past performance and future ESG ratings, we run regressions of the globe rating difference between December and the interim assessment month on past returns and control variables on US and European growth funds pooled together and separately. We find a negative relation that is explained by negative performance associated with

an increase in globe rating from the assessment month to the year-end.[7] The results are stronger for the US sample, and we focus on this sample for most of the rest of the analyses.

To analyze which globe level of funds in the interim assessment are more likely to increase globe ratings at the year-end, we follow Sirri and Tufano (1998) by using piecewise linear regressions to decompose the sensitivity of globe change to past performance in each of five globe ratings. The dependent variable is the globe difference between December and the assessment month. The independent variables are the five interactions of past cumulative returns and globe ratings on the assessment months. We also separate "losers" from "winner" within each globe. We find that the negative relationship between past performance and future globe rating can be explained by loser funds in low globes (one or two globes) and four globes chasing higher globe ratings to attract flows and to avoid outflows at the year-end.

Next, we turn to a fund-stock-level analysis to understand how managers who engage in the ESG tournament change portfolio holdings to increase globe ratings. Using stock' ESG data provided by Sustainalytics, and Morningstar peer groups, we identify an ESG stock as a stock whose ESG score is higher than the peer group before September 2019 or whose ESG risk score is lower than the peer group starting from September 2019.[8] We then divide ESG stocks in a fund

[7] To check the robustness of our results, we run three additional analyses. First, we use an alternative measure of past performance computed by subtracting the return of the primary prospectus benchmark index from the fund net return. Second, we replace the globe difference with the globe ratio of December to the assessment month. Finally, we examine the tournament of globe rating using fiscal year instead of calendar year. The results are consistent.

[8] From March 2016 to 2019, a stock's ESG score is calculated by Sustainalytics by taking its ESG score minus the controversy score. Firm-level ESG scores reveal how well a firm addresses ESG issues based on preparedness, disclosure, and performance. Firm-level controversy score includes environmental accidents, fraud, and discriminatory behaviour by the issuing firm. Therefore, the higher ESG score, the better the firm's ESG level. After 2019, Morningstar dropped the controversy score and changed their methodology defining an ESG *risk* score that representing the magnitude of a firm's unmanaged ESG risk. The higher the ESG risk score, the worse the firm's ESG

into existing ESG stocks from the last quarter and newly added ESG stocks. Using a regression analysis and controlling for firm-level ESG changes, we find that one-, two-, and four-globe "loser" funds chasing higher globe ratings tend to sell holdings of non-ESG stocks and add new ESG stocks to their portfolios.

We then examine how investors respond to the ESG chasing behaviour of "loser" funds that increased from low globes (one or two globes) to high globes. We focus on funds that are "losers" before the increase in globe ratings and remain "losers" till the next-year February (we label them "double losers"). We do this to avoid the impact on flows of an improvement in performance and control for flow changes resulting from poor performance. For each "double loser" with an increased globe (treated group), a matching "double loser(s)" without an increased globe (control group) is identified as the fund with the closest propensity score computed from logit regression. We find that "double losers" with increased globes experience fewer outflows during the quarter than "double losers" without increased globe. We also find that the "double losers" in the treated group have fewer outflows in the 12 months after the increase in globe. This finding implies that a high ESG rating helps poorly performing funds to attenuate outflows.[9]

We also investigate the relation between window dressing and ESG chasing behavior. Window dressing occurs when managers adjust portfolios towards winning stocks at the end of reporting periods to earn more flows (e.g., Agarwal et al. 2014). Thus, we test whether window-

level. The calculation of portfolio sustainability score which is the weighted sum of firm-level ESG in the disclosed holding does not change.

[9] We also examine whether the increase in ESG ratings of "loser" funds helps them to improve performance, but we do not find evidence of that.

dressing managers add more stocks with high ESG scores given the flow effect of globe ratings. Using Agarwal et al. (2014)'s measure for window dressing, the backward holding return gap (BHRG), we find that managers with the greatest propensity to engage in window dressing hold less ESG stocks and have lower globe ratings than their counterparts. We further investigate whether fund managers engage in window dressing using ESG when they have the highest incentives. We find that funds with portfolio sustainability scores around four-/five-globe breakpoints are more likely to engage in window dressing than funds far away from the breakpoints. These results provide evidence that in some situations some mutual funds may engage in window dressing to obtain an upgrade in globe or avoid downgrading.

Finally, we examine whether growth fund managers chase another ESG-related label, the Low Carbon Designation (LCD), launched in April 2018 by Morningstar. We find that past "losers" among European growth funds are more likely to gain the LCD at the year-end than past "winners", which is consistent with the flow effect associated with LCD. For the US sample, past "losers" also chase the LCD but the proportion is smaller relative to the European growth funds.

On a broader level, our paper contributes to the literature that examines strategic actions that managers take to increase fund flows. Cooper et al. (2005) show that mutual funds change their names to take advantage of hot investment styles and experience abnormal inflows without improvement in performance. Sensoy (2009) shows that mismatched self-designated benchmarks are used to improve flows. Massa et al. (2010) find that fund families weigh the benefits of disclosing fund manager names and assigning named managers who attract more media attentions and greater inflows against their associated costs. In this paper, we provide new evidence that in

response to the high demand for ESG investing, mutual funds strategically affect their Morningstar sustainability ratings in the US and their LCD in Europe to attract more flows. Recent papers analyze investors' reactions to Morningstar sustainability ratings. In addition to Hartzmark and Sussman (2019) discussed previously, Ammann et al. (2019) find strong evidence that retail investors move their money from low-globe to high-globe funds, whereas institutional investors' moves are weaker.[10] Ceccarelli et al. (2023) show that after the release of the LCD, funds with the LCD label experienced a significant increase in flows. In addition, funds respond actively to gain the label by reducing their portfolio carbon risk scores. We supplement their work by finding that globe and the LCD chasing behavior are negatively related to funds' past performance. Managers use a high ESG rating or the LCD label as tools to offset some outflows from poor performance. Gantchev et al., (2024) document that, during the first year following the release of globe ratings, mutual fund managers buy ESG stocks to improve globe ratings, raising prices of ESG stocks. Funds with increased globe ratings show lower subsequent performance for holding overpriced ESG stocks. Different from their work, we demonstrate that the incentive of managers' globe chasing behavior is based on funds' mid-year performance rankings. Specifically, underperforming managers[11] in the first half of the year chase globes in the second half of the year to offset the outflows from the underperformance.

[10] We also separately analyze retail and institutional funds. We find that retail funds not only exhibit a stronger ESG tournament than institutional funds in growth funds but also exhibit ESG tournament in other active fund styles. This finding further strengthens the causal relationship between ESG tournament and fund flows. In response to a stronger flow-globe relationship in retail classes, retail fund managers are more likely to engage in globe chasing behavior than institutional fund managers.

[11] These "loser" funds differ from the funds with poor performance described in Gantchev et al. (2024), as the losers funds with one or two globes have the strongest incentive to engage in globe-chasing behavior, whereas the funds described by Gantchev et al. (2024) already possess high globe ratings.

Our paper is also related to the literature that highlights some opportunistic behavior related to ESG. In particular, there is evidence of *greenwashing*, the practice of some fund managers to label themselves as ESG to attract inflows without walking the talk and committing to responsible investing (e.g., Gibson Brandon et al. 2022 and Kim and Yoon 2023).[12] There is also evidence of greenwashing in mutual funds' voting on environmental and social issues (Michaely et al. 2024). We contribute to this literature by providing evidence that some funds opportunistically tilt the portfolio to ESG to achieve better net flows and without an improvement in terms of financial and climate performance.[13]

Furthermore, our paper contributes to the literature on tournaments among mutual fund managers. Following Brown et al.'s paper (1996), many studies discuss the internal competition among managers and its related agency problem. There are conflicting findings. For example, using daily return, Busse (2001) finds, unlike Brown et al. (1996), that "losers" do not increase risk relative to their counterparts and attributes the difference to the biases in the monthly volatility estimates attributable to first-order autocorrelation effects in daily fund returns. Goriaev et al. (2005) argue that using monthly data to test the tournament hypothesis is more robust to the autocorrelation effects. Taylor (2003) argues that the results about which group of managers gambles on risk depend on the selection of benchmark. Schwarz (2012) further shows that the diverse results are related to the level of concurrent risk sorting that occurs during return sorting

[12] The SEC on March 4, 2021, made an announcement to investigate ESG misconduct including greenwashing by mutual funds.

[13] We examine whether fund managers who engage in globe chasing exhibit an improvement in portfolio carbon footprint and E score. We find that the improvement is limited or absent.

in the first half of the year and that after correcting the sorting bias, "losers" increased risk in the second half of the year. Different from these studies that focus on risk changes, we propose that the globe rating and the LCD are new targets used to compete, and to the best of our knowledge this is the first paper connecting ESG to the tournaments of mutual funds.[14] One benefit of focusing on ESG ratings is that this approach does not suffer from estimation biases.[15]

Finally, our paper contributes to the literature on window dressing in the mutual fund industry (e.g., Lakonishok et al., 1991; Ng and Wang, 2004; Meier and Schaumburg, 2004; Agarwal et al., 2014). Dantas (2021) illustrates that compared with conventional fund managers, ESG fund managers have less incentive to engage in window dressing since ESG investors do not require superior short-term performance. We find support for this prediction given that window-dressing funds prefer low ESG stocks and have lower globe ratings than their counterparts. We provide evidence of ESG window dressing, but only in specific situations, by showing that funds in four or five globes with sustainability scores close to the globe breakpoints may engage in window dressing to obtain a globe upgrade or avoid a downgrade.

2. Data and motivation

2.1. Background of Morningstar sustainability rating for mutual funds

[14] Kempf and Ruenzi (2007) find that mutual fund tournament also exists within fund family and that funds' risk level in the second half of the year depends on their family rank. Following their paper, we investigate whether the ESG tournament also exists within US fund family. We find evidence of an ESG tournament within fund families although weaker than in the full sample of growth funds.

[15] There may be measurement issues related to ESGs (e.g., Berk et al. 2022). However, Hartzmark and Sussman (2019) show, and we also replicate their results for growth funds in our sample, that investors' flows are affected by Morningstar sustainability ratings, which suggest that they rely on these ratings despite potential measurement errors.

On March 1st, 2016, Morningstar introduced the Morningstar Sustainability Rating for mutual funds. The rating measures how well a portfolio in Morningstar database performs on material ESG issues relative to its peer group (Morningstar Sustainability Rating Methodology, 2021). More than 20,000 mutual funds were ranked on a percentile basis and given a globe rating according to their historical holdings. The goal is to help investors evaluate and compare mutual funds' performance on environmental, social, and governance factors. Based on firm-level ESG score managed by Sustainalytics, Morningstar calculates the sustainability score on fund-level based on the most recently disclosed portfolio holdings and then ranks funds within the same Morningstar category into five levels[16]. Morningstar labels the best 10 percent of funds as five-globe (high sustainability) whereas the worst 10 percent as one-globe (low sustainability). Funds with two-globe ("below average"), three-globe ("average"), and four-globe ("above average") are ranked in the bottom 10% to 32.5%, 32.5% to 67.5%, and 67.5% to 90% percentile, respectively.[17] Since August 2018, Morningstar enhanced its calculation methodology and removed the globe ratings before this date.[18] To reconstruct globe ratings before 2018, we follow the 2016 Morningstar's calculation methodology that is based on the portfolio sustainability scores each

[16] Morningstar updates the globe levels monthly. A fund with quarterly holding disclosure may have different globe ratings within a quarter because its monthly percentile ranks would change in the fund category.
[17] Some funds that do not receive a globe rating from Morningstar because there are less than 10 funds within their categories or over 33% of the fund holdings are short positions, options, and derivatives issued by third-party financial firms (Morningstar Sustainability Rating Methodology, 2016).
[18] Details on the methodology changes are in Morningstar Sustainability Rating Methodology (2021). Other papers (e.g., Hartzmark and Sussman, 2019; Gantchev et al., 2024; Ammann et al., 2019) use Morningstar sustainability Rating before 2018 because they start work around 2016-2017 when the old version of globe rating is available, and their sample periods do not include 2018.

month, each fund is assigned a percent rank within its Morningstar categories and a globe rating if its percent rank falls in the percentile range of a globe.[19]

2.2. Description of our sample

Our analysis is based on two main databases, covering the period from March 2016 to December 2022: Morningstar Direct and CRSP Survivor-Bias-Free U.S. Mutual Fund Database. From Morningstar, we download the survivorship-bias-free data (all in USD) for actively managed open-end mutual funds domiciled in Europe and the US. The CRSP Mutual Fund database is used for US funds' performance, assets under management, fees, and historical portfolio holdings. We merge the two databases for US funds using share class's Ticker, CUSIP, and names following Pastor et al. (2013). For funds with multiple share classes which typically differ in fee structure and target clientele, we aggregate to fund level using the total net assets value-weighted average of share classes. To work with a homogenous sample, we exclude funds classified by Morningstar as pure fixed income funds, sector funds, and funds investing exclusively outside the US, Europe, and UK. Based on Morningstar's active management indicator, fund style box, and Morningstar available[20], we further select 2,464 distinct US and European growth funds for which information on total net asset, monthly returns, and Morningstar Sustainability Rating is available.

[19] The self-calculated globe ratings do not affect the results. We find consistent results using data before and after August 2018.

[20] The funds belong to the following Morningstar categories: Europe Large Cap Equity, Europe Mid/Small Cap Equity, Global Large Cap Equity, Global Mid/Small Cap Equity, UK Large Cap Equity, UK Mid/Small Cap Equity, US large Cap Growth Equity, US Mid Cap Equity, US Small Cap Equity. Growth funds are further selected using style box.

Table 1 Panel A shows the summary statistics of the full sample of 133,177 growth fund-month observations. We report summary statistics of US and European fund characteristics in Table 1. Fund size is the sum of the total net assets (in millions USD) across all share classes. We exclude the funds' size of less than $15 million following Elton et al. (2001) as they show that the returns on small funds have an upward bias in the CRSP database. Monthly fund flows are defined as the dollar change in the total monthly net assets value minus the price appreciation of fund assets over the month (Chevalier and Ellison, 1997; Sirri and Tufano, 1998). Specifically, the fund flow into fund i in month t is defined as

$$Flow_{i,t} = \frac{TNA_{i,t} - TNA_{i,t-1} \times \left(1 + Ret_{i,t}\right)}{TNA_{i,t-1}}$$

where $Ret_{i,t}$ is the fund's return in month t.

Fund flows may be affected by special events, such as fund merging. Hence, we follow previous studies (e.g., Hartzmark and Sussman, 2019; Ceccarelli et al., 2024) and winsorize fund flows at the 1% level (top and bottom). To further decrease the noise, we normalize the flows using Hartzmark and Sussman's method (2019). We divide all growth funds into deciles based on size and assign each fund to percentiles based on flows in each size decile for each month. Normalized flows range from 0.01 to 1.00. Fund age is the number of years since the inception date of the oldest share class. Fund returns, expense ratio, and turnover are the sum of weighted average with weights equal to the total net assets from each share class. On average, US and European growth funds in our sample is 13.28 years old, manages $1420.81 million of assets, charges 1.11% in expenses, and earns 0.99% returns. Flow volatility is the standard deviation of fund flows in the

past 12 months. Morningstar (MS) globe rating ranges from 1 ("Low") to 5 ("High"). We require that each fund in the sample has at least globe rating records at (fiscal) year-end month and any interim assessment month within one (fiscal) year so that we can observe its globe rating changes. Morningstar Overall Rating (star rating) is an integrated evaluation of the share class's financial performance, ranging from 1 ("Low") to 5 ("High"). Panel B and C include summary statistics for 865 US growth funds and 1599 European growth funds. US funds generate 58.31% turnover ratio[21] on average. Compared with European growth funds, US growth funds have higher age, larger size, lower star rating, and lower flow volatility in 2016-2022.

[Table 1]

2.3. Morningstar ESG rating and fund flows

This paper is motivated by the finding of Hartzmark and Sussman (2019) that there is a statistically significant relation between fund flows and ESG globe rating since the introduction of Morningstar globe rating. They find that for US mutual funds from March 2016 to January 2017, one-globe funds suffer significant outflows, while five-globe funds receive significant inflows. Table 2 replicates their work for the actively managed US equity funds from March 2016 to December 2022 and extend it to the European actively managed equity funds. In particular, we run a regression of normalized fund flows on fund globe rating and control variables. Control variables

[21] Morningstar does not provide turnover ratio information for many European growth funds. Turnover ratio is therefore excluded in all European sample regressions.

are the same Hartzmark and Sussman (2019), including previous month funds' Morningstar Overall Rating (Star rating), previous month expense ratio, return, and the logarithm of size, the logarithm of fund age, and cumulative returns of prior 12 and 24 months.

We investigate growth, value, and blend funds separately to analyze whether Hartzmark and Sussman's main result (2019) varies across fund categories. US growth funds exhibit a similar patten as in Hartzmark and Sussman (2019). One-globe and two-globe growth funds have 3.43 and 1.60 percentile lower normalized flows than three-globe growth funds (average level) for a similar level of performance and other fund characteristics. At the same time, five-globe growth funds can earn 1.92 percentile more normalized flows on average. For two growth funds with similar characteristics and historical performance, a fund with one- or two-globe fund would receive 5.35 or 3.52 percentile less normalized flows per month than a five-globe fund. European growth funds also show a significant outflow effect among one- and two-globe funds (-2.92 and -1.38 percentile). They also show an inflow effect among five-globe funds (0.84 percentile) at 10% significance level. When we focus on value and blend funds in US and Europe, they exhibit the inflow effect related to five globes (0.97 percentile and 1.05 percentile), but there is no outflow effect related to low globes.

Overall, compared with value and blend funds, growth fund managers have a stronger incentive to affect funds' globe ratings to avoid outflows, attract inflows, and compete with their peers. Therefore, we focus on globe rating changes on growth funds. Another reason, as indicated by Brown et al. (1996) is that growth funds receive more attention from the financial press and

retail investor involvement than other funds.[22] Their managers have also a reasonable degree of scope and flexibility in asset allocation, making them become the most widely followed and often-ranked class among publicly traded funds.

[Table 2]

3. Empirical methodology and results

This section contains the main results using fund sorting and regressions. We also consider which level of ESG and fund performance drive the results, how managers that engage in the ESG tournament adjust their portfolio, and the investors' response to the ESG tournament.

3.1. Fund sorting results

We sort all funds in our sample into "losers" and "winners" in each assessment month *M* based on fund performance which is the cumulative returns from January to the assessment month and normalize them using the Morningstar category and date by subtracting the category cumulative return and dividing by the category standard deviation. Following mutual fund tournament studies (Brown et al., 1996; Qiu, 2003; Hallahan and Faff, 2009), we consider March to August as assessment months. During these months managers are more likely to review and compare their interim performance with peers. "Losers" are funds with below median performance

[22] In our sample, compared with value and blend funds, growth funds have a lower proportion of assets from institution classes (45.35% vs. 50.27%), which, as shown by Ammann et al. (2019), exhibit a weaker globe-flow effect than retail classes. Additionally, a greater proportion of growth funds have distribution fee (72.86% vs. 63.70%) for advertising the fund and compensating brokers for selling shares. The average monthly distribution fee charged in retail classes is higher for growth funds (0.84 basis points vs. 0.67 basis points) than for value and blend funds, indicating that growth funds invest more heavily in attracting retail investors.

relative to other funds with the same investment objectives classified by Morningstar. [23] After the interim assessment, a manager may decide to adjust portfolio holdings towards ESG stocks that elicit an increase in the globe rating during the last several months of the year. If at the end of the year, the globe rating is higher than that in the assessment month, then the manager may benefit from the higher ESG rating to attract flows or avoid outflows. Our hypothesis is that past "losers" are more likely to conduct such behaviour than past "winners" because "losers" need to strengthen other aspects that are valued by investors to trade off poor performance and maintain assets under management, which is related to their economic incentives. We compare the proportions of "losers" and "winners" with increased globe ratings at the year-ends and use a Z-test to assess whether there are statistically significant differences in two proportions from the two samples. We exclude data in March 2016 because of low coverage for the ESG data, and observations in 2019 because Sustainalytics replaced firm-level ESG scores with ESG risk score in September - November 2019, affecting portfolio sustainability score and globe rating. Funds experience systematic globe upgrading or downgrading in the remaining months of 2019 and thus the globe difference between interim assessment months and December 2019 cannot fully reflect the impact of managers' strategic actions on globe rating.[24]

Table 3 shows the proportion of "losers" and "winners" with increased globe ratings at the year-end testing the tournament hypothesis for US and European growth funds. The proportions of "losers" with increased globe ratings at year-ends are significantly higher than "winners" with

[23] We also checked funds whose performance percentile is below 40% and whose Morningstar rating is one- or two-star during interim assessment months, the results are consistent.
[24] Adding data in 2019 does not affect our conclusions.

increased globe ratings in all the interim assessment months. April has the highest proportion of "losers" with globe rating increasing (19.58%) and March has the largest proportion differences (4.00%). The proportion of losers and its difference with the proportion of "winners" decrease as the interim assessment occurs later. "Losers" may not have sufficient time to adjust portfolio holdings and have an impact on globe rating. Especially after August 2018 when Morningstar started to use historical portfolio scores of the past 12 months to calculate globe rating, managers planning to increase globe rating required more time to make the adjustments.

Given the stronger incentives of one- and two-globe funds, we also look at whether more "losers" in these two globe levels increase to higher levels to avoid outflows. Table 3 Panel B illustrates the proportion of one- and two-globe "winners" and "losers" with increased globes at the year-end. We find statistically significant more low-globe "losers" that increase to high-globes than low-globe "winners" in all assessment months with April reaching the highest proportion of "losers" (31.47%) and March reaching the highest proportion differences (12.73%) again. Since low-globe funds suffer extra outflows controlling for performance, the proportion differences are more likely to be dominated by "losers" with globe rating increases rather than "winners" with globe rating decreases. Considering the inflow effect of five-globe funds, Table 3 Panel C show the proportion differences of "losers" and "winners" that increased to five-globe from other globes. The significant differences concentrate on interim assessment months that occur before July and the number of "losers" increased to five-globe decreases as the assessment month occurs later. Managers in the low globes require more stock adjustment to increase to five globes and may not have sufficient time for those adjustments in the late assessment months. Moreover, European

growth funds may not have strong incentive to increase to five-globe because they would not benefit from high inflows from ESG investors. The Internet Appendix provides the results focusing on US growth funds and the results are stronger.

Overall, the results in Table 3 are consistent with past "losers" in US and European growth funds being more likely to tilt the portfolios to receive a globe rating increase at the year-end than past "winners", consistent with the inflow and outflow effects in Table 2. Although the response to the inflow effect is weaker than the response to the outflow effect, these results are consistent with managers strategically altering the ESG of the portfolio to avoid outflows due to low ESG ratings or to obtain more inflows by moving to five globes.

[Table 3]

3.2. Regression results

Next, we use regressions to further investigate the relationship between past performance and future globe ratings. With the regressions we can control for fund characteristics that may affect the results. The independent variable is past cumulative returns from January to the assessment month, *M* (*M*=March, April, May, June, July, and August), in a given year. We normalize the cumulative returns using the Morningstar category and date by subtracting the category cumulative return and dividing by the category standard deviation. The dependent variable is the difference in the fund globe rating between December and the assessment month *M* in year *t*. We also replace the ratio of the globe rating in December with that in the assessment

month as robustness, and the results are consistent. We estimate the following Equation (1) in each assessment period:

$$Globe_{j,Dec.,t} - Globe_{j,M,t}\left(or\ \frac{Globe_{j,Dec.,t}}{Globe_{j,M,t}}\right) = \alpha + \beta_1 Performance_{j,M,t} + \beta_2 Controls_{j,M,t} + \theta_{country} + \gamma_{c,t} + \varepsilon_{j,Dec,t} \quad (1)$$

Control variables are previous month turnover ratio, expense ratio, Morningstar Overall Rating, and the logarithm of fund size, the logarithm of fund age, funds' globe rating in assessment month M, fund risk in the rest of months, and flow volatility in the past 12 months. We also include country fixed effect and Morningstar fund category times year fixed effect.

Table 4 Panel A reports the results. (M, 12-M) indicates that the interim assessment occurs in month M, and there are 12-M months left for managers until the year-end. For example, (March, 9 months) means that if the interim assessment occurs in March, there are nine months left for managers to decide whether adjust portfolios for affecting the globe rating. We find a negative relation between past cumulative returns and the globe difference: the lower the past performance, the higher the future globe rating. Specifically, the negative relation is the strongest in April. A one standard deviation decrease in cumulative return from January to April is associated with a 0.044 increase in the globe rating difference between April and December. The negative relation suggests that if a fund does not perform well among its category during the interim assessments, the manager would cater to the investors' preference for high ESG and achieves a higher globe rating before the year-end to maintain and attract flows. From April to August, the coefficients on cumulative returns decrease (from -0.044 to -0.038), remaining significant at 1% level. The finding

suggests that the earlier the assessment month, the higher is the probability that the "losers" chase the ESG ratings because of the longer time for altering the portfolio. Morningstar calculates portfolio sustainability score based on the most recent holding. If managers disclose portfolio holdings quarterly, it requires some time to have an impact on the ratings.[25] Also, the methodology change in August 2018 when Morningstar started to use historical portfolio scores of the past 12 months to calculate globe rating may prolong the time for altering the portfolio.

Given the stronger flow effects of globe rating for the US sample documented in Table 2, we run the regressions of globe rating change on past performance only for the US growth funds. Table 4 Panel B show that the coefficients for the US sample are larger than the full sample (-0.061 to -0.044 vs. -0.039 to -0.031), suggesting that US growth funds managers are the main drivers of the ESG tournament. We do not find a strong negative relation among European growth funds across every assessment month, probably because they do not have strong incentive to chase five-globe based on their weaker inflow effect than US growth funds' in Table 2. Globe rating in European growth funds may not be as popular or possibly, European investors and managers focus on other ESG measures.

[Table 4]

3.3. ESG tournament conditional on globe level

[25] We do not find evidence that the growth fund managers disclose portfolio holdings more frequently for affecting globe rating.

Next, we further investigate which globe drives the negative relation between past performance and change in ESG rating. We only focus on the US growth funds sample because they have the strongest incentive to engage in ESG tournament. Based on Equation (1), Equation (2) uses the piecewise linear regression framework of Sirri and Tufano (1998), which includes the interactions of a dummy for each globe with past performance. We run a regression for each assessment month using the same control variables and fixed effects of Equation (1), with the exception of country fixed effect given that we focus on the US sample.

$$Globe_{j,Dec.,t} - Globe_{j,M,t}\left(or\ \frac{Globe_{j,Dec.,t}}{Globe_{j,M,t}}\right) = \alpha + \beta_1 Globe_{j,M,t} + \beta_{2-6} Performance_{j,M,t} \cdot D_{Globe=i} + \beta_7 Controls_{j,M,t} + \gamma_{c,t} + \varepsilon_{j,Dec,t} \quad (2)$$

Table 5 presents the results. We are interested in the coefficients on the interaction variables between past performance and globe dummy. There is a significant negative relationship mainly shown in one, two, and four globes consistent with the outflow effect of one- and two-globe funds and the inflow effect of four-globe funds shown in Table 2. The results are consistent with one and two-globe funds with poor performance increasing their globe ratings after their interim performance. One-globe funds show the strongest negative effect in March and April compared with funds in other globes, because they may require more time given the largest adjustment of portfolio holdings and the fund managers may balance the benefit and cost of tilting to ESG. Two-globe funds show significant negative effect in all assessment periods and their coefficients becomes the largest after April, implying their strongest incentive of ESG chasing and avoiding outflow effects. Furthermore, four-globe funds show significant negative relationships in

April (-0.056), June (-0.046), and July (-0.040), implying that four-globe funds with poor performance have incentive to tilt the portfolio to achieve five globes to attract flows and those with good performance may be less concerned about flows and reduce to three globes. Considering that three-globe funds are not affected by the outflow effect, and they are far away from the five globes for the inflow effect, it is not surprising that the results for three-globe are mostly insignificant. Overall, the results of the piecewise regressions using globe ratings are consistent with the inflow and outflow effects that one-, two-, and four-globe funds are the main drivers of the ESG tournament.

[Table 5]

In Table 3 we documented that funds with below median performance are more likely to receive ESG ratings increase than their counterparts. This finding is consistent with managers altering the portfolio to take advantage of the ESG demand. Using regressions, we also provide evidence of a negative relation between performance and change in globe, and that this relation is driven by one, two and four globes. To further explore whether losing funds are driving this negative relation (rather than winning funds reducing the globe), we split growth funds in each globe into "losers" and "winners" based on median fund performance. We measure fund performance as the fund's cumulative returns from January to the assessment month and normalized by subtracting the Morningstar category cumulative return and dividing by the category standard deviation. We then interact the two performance dummies with the five globe dummies. We run regressions of globe difference on eight interactions of globe dummies and

performance dummies. The omitted groups are three-globe "winners" and five-globe "losers" given that they exhibit insignificant coefficients in separate regressions for every assessment month. The results show that one-, two-, and four-globe "losers" are associated with a significant increase of globe (see Table 6). This finding is consistent with one-, two-, and four-globe funds having the strongest incentives and being the most active in the ESG tournament. The results for "winners" are insignificant, which suggest that they do not engage in reducing the globe rating.

[Table 6]

3.4. Stock level analysis

After providing evidence of the incentives for managers to strategically affect globe rating and that losing funds are associated with an increase in rating, we then focus on how fund managers adjust their stock holdings to elicit a change in globe rating. It is important to understand that the globe rating is the percentile rank of portfolio sustainable score of funds in the same category and the score is the weighted average of stocks' ESG (risk) scores in that portfolio. Therefore, the main driver of any rating change is the portfolio weight in ESG stocks. The change of position in a fund j in stock i in quarter q following Gantchev et al., (2024) is defined as:

$$Position\ change_{\ j,i,q} = \frac{Price_{i,t-1}(Num_{shares_{j,i,q}} - Num_{shares_{j,i,q-1}})}{TNA_{j,q-1}}$$

A fund's position change is the sum of the position changes of one type of stock in each quarter. Based on the ESG (risk) scores of stocks from Sustainalytics, we define a stock as ESG stock if the ESG (risk) score is higher (lower) than that of peer group. Non-ESG stock is a stock

with ESG (risk) score lower (higher) than peer group's score. We consider assets that do not have an ESG (risk) score or are missed over a year as no-ESG assets. To investigate whether fund managers prefer to increase the holdings of existing ESG stocks in their portfolio or to open new positions for ESG stocks in future quarters, we further separate the three types of stocks (assets) held by a fund into existing stocks (assets) and new stocks (assets). We then measure the quarterly position change that are computed for the first full reporting quarter after the assessment month of a fund in a type of stocks.

For funds with different globe ratings in the interim assessment months, the proportions of stocks need to be adjusted are different. We interact five globes with the quarterly position change of funds in the stock type to investigate whether managers in different globe ratings in the assessment month adjust portfolios differently to tilt to ESG. We focus on "losers" that experienced globe rating increase from April to December. We also include "losers" stayed at three and five globes during the same period because they have incentive to maintain their globe ratings to avoid downgrade. We run panel regressions of globe difference between December and the interim assessment month on the five interactions and control variables for each type of stocks (assets) as described in the following equation:

$$Globe_{j,Dec.,t} - Globe_{j,M,t} = \alpha + \beta_1 Position\ change_{j,q+1} * Globe_{j,M} + \beta_2 ESG\ level\ change_{j,q+1} + \beta_3' Controls_{j,q} + \gamma_{c,M,t} + \varepsilon_{j,Dec} \quad (3)$$

We add the quarterly change of ESG level[26] of stocks in a fund computed during the same quarter as the quarterly position changes as a control variable because an increase of ESG score on firm-level may contribute to upgrading of globe rating. Other control variables include the logarithm of fund age, expense ratio, turnover ratio, the logarithm of fund size, flow volatility, fund risk in the past 6 months, and fund returns in the past 3 and 6 months. Table 7 shows that on average, "losers" that experienced a globe increase or maintain at three or five globes open new positions for ESG stocks. One globe funds have the largest marginal effect (3.252) given that they hold the least proportion of ESG stocks and reach a maximum to five-globe. To realize a globe increase, one-, two-, and four-globe funds decrease the holdings of existing non-ESG stocks. One- and two-globe funds also decrease the holding of stocks (assets) without an ESG score.

[Table 7]

3.5. Flow response to ESG tournament

So far we have provided evidence that growth fund managers with poor performance in the middle of the year increase their ESG ratings to avoid outflows and attract inflows from ESG investors. The next question is whether this ESG tournament behavior is successful in terms of flow response from investors. We focus on one and two globe US "loser" funds given that they suffer outflows of ESG and poor performance. We then identify one- and two-globe "losers" whose performance are below the median average from the month after the interim assessment

[26] There is an upward (downward) trend of firm's ESG (risk) scores in our sample period, and therefore we use the difference between firm's ESG (risk) score and its peer group average to represent firm's ESG level.

month to February of next year (we call them "double losers") to control for fund performance. We analyze whether one or two globe "double losers" with increased globe ratings at the year-end receive more inflows and fewer outflows, compared with one or two globe "double losers" without increased globes.[27] We aggregate the cases when "double losers" experience a globe rating increase during April (after the first interim assessment month) to the year-end and examine the three-month compounded (normalized) flow differences between February of next year and the month before the globe increase. We exclude funds that experience an increase in globe rating but drop again before February of next year. We first calculate the propensity score for each "double loser" at the month they experience a globe increase ("globe-increasing month"), which is the probability that a "double loser" with given characteristics experience a globe increase using the logit model in Equation (4). For each one- or two-globe "double loser" with an increased globe (treated group), matching "double loser(s)" without an increased globe (control group) in the same period is identified as the funds with the closest propensity score to the "double loser" with an increased globe. The outcome variable is the change of compounded flows, calculated by the compounded three-month flows from December to next year February minus the three-month compounded flows observed in the month before the globe increase. If the flow change in the treated group is less than the control group, then increasing the ESG ratings may have helped "double losers" suffer fewer outflows or attract inflows in the following periods. We use a *t*-test to assess if the two numbers from the two samples are statistically significant. The control variables

[27] We only observe net flows, hence it is not feasible to identify the magnitudes of the inflows and outflows.

in propensity score matching include the turnover ratio, expense ratio, logarithm of the total net asset, Morningstar Overall Rating in the globe-increasing month, logarithm of fund age, compounded fund flows from January to the globe-increasing month, performance rank before and after the globe-increasing month, standard deviation of returns measured as fund risk before and after the globe-increasing month, flow volatility in the past 12 months, Morningstar fund category dummies, and year-month dummies.

$$
\begin{aligned}
&Globe\ rating_{d=1\ if\ increase\ _{j,t}} \\
&= \alpha + \beta_1 Age_{j,M,t} + \beta_2 Expense\ ratio_{j,M-1,t} + \beta_3 Size_{j,M-1,t} + \beta_4 Star_{j,M-1,t} \\
&+ \beta_5 Performance\ (Jan, M-1)_{j,t} \\
&+ \beta_6 Compound\ flow\ (Jan, M-1)_{\ j,t} + \beta_7 Risk\ (Jan, M-1)_{j,t} + \beta_8 Risk\ (M, Feb)_{j,t} \\
&+ \beta_9 Performance\ (M, Feb)_{j,t} + \beta_{10} Flow\ volatility_{j,(M-1,M-12),t} \\
&+ \beta_{11} Turnover_{j,M-1,t} + MS\ category_j + Year * Month_t \\
&+ \varepsilon_{j,t}, \qquad (4)
\end{aligned}
$$

Table 8 Panel A shows that one- or two-globe "double losers" with increased globe ratings have fewer compounded outflows until next February than those without increased globes (-0.028 vs. -0.047 and (-0.227 vs. -0.478). The result implies that although "double losers" experience outflows until February, on average, an increase in ESG ratings can further mitigate the loss of flows. We also check the three-month compounded flows using October to December and November to January, the results are consistent.

We then consider a longer window given that the flow response may take longer time than 3 months. Based on the previous treatment group, we further select among the "loser" funds (with below median performance) one- or two-globe "double losers" whose cumulative performance is below the median in the next 6 months and 12 months, respectively. We exclude those cases whose

globe ratings are downgraded in the next 6 months (12 months). The control group is the "double losers" that remained in one- or two-globe in the same period. We calculate 6- and 12-month compounded (normalized) flows before and after the globe-increasing month, and the flow difference is the outcome variable for the treated group. Outcome variable for the control group is the flow differences for the "double loser(s)" before and after the globe-increasing month of the matched treated group. We add 6 months (12 months) cumulative performance difference before and after the globe-increasing month to the control variables in Equation (4). Panel B shows that one- or two-globe "double losers" with increased globes experience fewer compounded outflows than the control group in the next 6 months after the globe increase (-0.009 vs. -0.081) and in the next 12 months (-0.079 vs. -0.163). Normalized outflows in the next 6 months are also fewer (-12.201 vs. -14.142). In summary, investors reward with net flows the "double losers" with an increase in ESG ratings, and the effect persists up to a year even if the funds are underperforming.

[Table 8]

4. Window dressing and ESG

Earlier literature (e.g., Lakonishok, et al., 1991; Meier and Schaumburg, 2004; Ortiz et al., 2012; Agarwal et al., 2014) reveals that some fund managers with a low rank of performance engage in window dressing just before their reporting period and thus disclose disproportionally high proportion of winning stocks and low proportion of losing stocks based on the stocks' recent performance. The goal is to make their portfolios more attractive to the investors. Investors are

more likely to believe that fund managers have stock selection ability if they attribute the performance to high proportion of winning stocks and will reward the funds with higher flows. We test whether window-dressing managers engage in ESG chasing by adding more ESG stocks and in particular winning stocks with high ESG scores ("ESG winning" stock), given the flow effect of globe ratings. We identify the window-dressing managers using the measures of Agarwal et al. (2014), the Backward Holding Return Gap (BHRG), which captures the difference between performance of the portfolio disclosed by the fund at each fiscal quarter end and actual performance of a fund. If the fund performance is inconsistent with the corresponding performance of the portfolio holdings, then a fund may engage in window dressing. The higher the BHRG, the larger the discrepancy between fund and disclosed portfolio performance and, therefore, the higher the probability of window dressing. We also follow Agarwal et al. (2014) in how we define winning (losing) stocks. We create quintiles of all US stocks in CRSP stock database by sorting stocks in descending order based on their past 3 months returns at the end of each fund's fiscal quarter. Winning (losing) stocks are defined as the stocks in the 1^{st} (5^{th}) quintile, i.e., stocks that achieve the highest (lowest) returns.

Table 9 Panel A illustrates the times series cross-sectional averages of proportion of winning stocks, winning stocks with high ESG scores[28] ("ESG winning" stocks), low ESG scores ("non-ESG winning" stocks), proportion of ESG and non-ESG stocks in funds with high and low values of BHRG. Funds with top 30% (20%) value of BHRG have the highest probability of

[28] Stocks with high ESG scores are defined as same as before. we define a stock as ESG stock if the ESG (risk) score is higher (lower) than that of peer group. Non-ESG stock is a stock with ESG (risk) score lower (higher) than peer group's score. We consider assets that do not have an ESG (risk) score or are missed over a year as no-ESG assets.

window dressing, compared with funds with bottom 30% (20%) value of BHRG who have the least probability of window dressing. The top 30% (20%) group holds a lower proportion of ESG stocks and in particular "ESG winning" stocks than the bottom 30% (20%), 12.935% vs. 16.919% (12.666% vs. 16.779%), whereas the top 30% (20%) group holds a higher proportion of "non-ESG winning" stocks than the bottom 30% (20%) group, 18.236% vs. 9.225% (19.262% vs. 9.017%). These results imply that window dressing managers do not chase ESG scores of funds at the quarter ends, but managers with the least probability of window dressing care more about fund ESG scores. The globe rating in bottom 30% (20%) is statistically significantly higher than that in top 30% (20%) group, 2.863 vs. 3.383 (2.788 vs. 3.429), suggesting that funds with high probability of window dressing have lower globe ratings on average. Furthermore, fund quarterly return in window dressing group is also significantly lower than non-window dressing group. Overall, window-dressing managers prefer non-ESG stocks, and the preference may not be due to the average performance of ESG stocks as managers with the least propensity to window dressing hold more ESG stocks and earn higher quarterly returns on average. We also check whether the probability of window dressing is related to globe rating, and in Table 9 Panel B, we find a negative relationship between globe rating in the last quarter and BHRG, suggesting that window dressing funds do not focus on ESG ratings and remain in relatively low globe levels. Our results are consistent with Danta (2021) that found that ESG funds have less incentive to window dressing.

To further test whether ESG tournament is distinct from window dressing, we examine funds' BHRG after the first interim assessment month till the fiscal year-end with different globe rating changes. We focus on funds with four or five globes because their window dressing is more

likely to include ESG stocks than low-globe funds. Table 9 Panel C shows that four-globe funds with increased globe ratings at fiscal year-ends have a lower window dressing level on average than the funds staying in four globes. Funds remaining in five globes have the lowest window dressing level. Four-globe funds with decreased globe rating have higher window dressing level than other four-globe funds, consistent with the result in Panel A that window dressing funds prefer to hold non-ESG stocks and are more likely to have low globe ratings.

The result that funds staying in or increased to five globes have lower window dressing level than other funds cannot exclude the possibility that some funds use window dressing in some special cases to gain high ESG ratings in the disclosed portfolio. Therefore, we investigate the window dressing level of funds in four or five globes around breakpoints of three-/four-globe and four-/five-globe. These breakpoints represent special cases where the incentive to window dress is the highest. Four-globe funds are divided into quartiles based on their portfolio sustainability score: 1st quartile (the closest to three-/four-globe breakpoint), 2nd and 3rd quartile (middle), and 4th quartile (the closest to four-/five-globe breakpoint). We then divide five-globe funds into funds closer to four-/five-globe breakpoint with sustainability score lower than the median and funds with sustainability scores higher than the median of five-globes' scores. In Table 9 Panel D presents the BHRG levels after the first interim assessment month till the fiscal year-end for different group of funds. Among four-globe funds with increased to five globes at the fiscal year-end, the funds with sustainability scores closer to four-/five-globe breakpoint are more likely to window dress than the funds with the scores in the 2nd & 3rd quartile. Among four-globe funds maintaining their globe ratings at the fiscal year-ends, the funds with sustainability scores closer

to four-/five-globe breakpoint (4th quartile funds) are more likely to window dress than the funds with scores in the 2nd & 3rd quartile. 4th quartile funds staying in four globes have portfolio sustainability scores closer to the four-/five-globe breakpoint than 2nd & 3rd quartile funds, and therefore have higher incentive to window dress. There is no significant difference of BHRG between 2nd & 3rd quartile funds and funds closer to the three-/four-globe breakpoint (1st quartile funds), implying that these funds do not show obvious window dressing behavior to avoid downgrading from four globes to three globes. Five-globe funds with sustainability scores close to the four-/five-globe breakpoint exhibit higher window dressing than other five-globe funds probably to avoid a downgrade. Overall, our results provide some evidence that four- and five-globe funds with portfolio sustainability scores around the four-/five-globe breakpoint are more likely to engage in window dressing than the funds with the scores in the middle of a globe level.

[Table 9]

5. Tournament on the Low Carbon Designation

On April 30, 2018, Morningstar started to publish the Portfolio Carbon Risk Score, a measure designed to help portfolio managers and investors strategically manage their exposure to carbon risk.[29] Morningstar then assigned a Low Carbon Designation (LCD) label to funds with

[29] It is also known as climate transition risk, the risk resulting from the transition from a fossil fuel reliant economy to a lower carbon economy. Morningstar's carbon risk score does not reflect the exposure to risk caused by extreme weathers and events by climate change, which is also known as climate physical risk.

low Portfolio Carbon Risk Scores and low levels of fossil fuel exposure, helping fund investors identify and monitor funds that align with the transition to a low carbon economy (Morningstar, 2018a). Ceccarelli et al. (2023) shows that after the release of the LCD, Europe and US domiciled funds with the LCD label experienced a significant increase in flows and funds respond actively to gain the LCD label by reducing the portfolio carbon risk scores. In this section, we investigate whether there is evidence of another tournament related to LCD.

Firstly, we run a similar analysis to Table 2 and examine the flow effects of the LCD in the US and Europe, controlling for the change of star rating, globe rating, and fund characteristics (see Table 10, Panel A). In column (1) and (3), we find a significant inflow effect of the LCD in European growth funds, while an outflow effect in US growth funds since April 2018. Since the environmental aspect of a portfolio sustainability score and portfolio carbon risk scores are highly correlated and since globe rating and LCD are shown together on the Morningstar website when investors screen a fund' sustainability performance, we investigate how the flow effect of LCD interact with the globe ratings using interaction terms of the two measures. For the US sample (column 2), the outflow effect is driven by one- to three-globe funds and only five-globe funds exhibit an inflow effect. For the European sample (column 4) there is no outflow effect, and the inflow effect mainly comes from three-, four-, and five-globe funds. The results imply some differences between US and European investors, but both pay attention to LCD for high globe funds.

Based on the flow relationships, we then analyze whether there is an LCD chasing behavior among "losers" who intend to mitigate outflows from poor performance with more inflows from

the LCD. Table 10 Panel B shows that more "losers" in interim assessment gain the LCD at the year-end than "winners" among European growth funds if the interim assessment occurs in April to August, which is consistent with the inflow effect. Panel C shows that US growth fund managers also chase on LCD, but the proportion is lower than European managers (e.g., April: 12.88% vs. 8.04%). In conclusion, there is some evidence consistent with an LCD tournament and this evidence is stronger for European funds than US funds.

[Table 10]

6. Other results

This section includes some robustness checks and additional analyses. In particular, we test the robustness of our main results in the US sample, when we use alpha instead of raw returns to identify "losers" and "winners". We also analyse whether the ESG tournament is still present when we use fiscal-year rather than calendar-year and whether the ESG tournament exists within a fund family. We also show how US growth fund managers engaging in the ESG tournament change E-, S-, and G-scores to affect the overall ESG scores at the year ends. Finally, we consider whether the ESG tournament affect the fund performance at the year ends. Results are provided in the Internet Appendix.

In light of Brown et al. (1996), many papers focus on tournaments in the mutual fund industry. However, they do not get consistent results about past performance and future fund risk. For example, Chevalier and Ellison (1997) and Qiu (2003) show that the "winners" are the funds

that gamble on risks. Taylor (2003) argues that using exogenous benchmarks, such as an index fund, to compare risk-adjusted performance, will motivate "losers" to gamble while "winners" lock in their leading position. On the other hand, using endogenous benchmarks, such as median fund performance, will induce "winners" to gamble. To test whether the results of an ESG tournament can be affected by the choice of the benchmark, we replace fund returns with the fund alpha from January to the assessment month. The alpha of each fund before an interim assessment is calculated as the difference between the cumulative returns of a fund and the cumulative returns of its primary prospectus benchmark. Other control variables follow Equation (1). Table IA-1 shows the result of the fund alpha on the globe difference between December and each assessment month. Overall, we get a similar result to our main regression results in Table 4 Panel B. The lower the fund alpha, the more the increase in globe rating in December. The strongest effect is in the April assessment (-0.063), and the coefficients decrease as the assessment occurs later.

Studies about tournament in the mutual fund industry consider that fund's fiscal year-end could be relevant for managers' tournament. Fiscal year-ends also have required reporting, receiving substantial financial and press coverage. We test changes in globe rating from the assessment month to the year-end month in the fiscal year. Table IA-2 is the portfolio sorting results of the number of "losers" and "winners" who increased globe rating at the fund's fiscal year-end. Like the methodology in calendar year, we consider that the interim assessment month can occurs from the third month to the eighth months of the fiscal year. (3^{rd}, 9 months) indicates that the interim assessment occurs in the third month and there are 9 months left for managers to make decisions about globe ratings. We find consistent results using the fiscal year-end: there are

statistically significant more "losers" with increased globe rating at the fiscal year-end than "winners".

Kempf and Ruenzi (2008) find that mutual fund tournament also exists within a fund family and that funds' risk level in the second half of the year depends on their family rank. Following their paper, we investigate whether the ESG tournament also exists within fund family. We look at funds that are included in US fund families as identified by Morningstar. We exclude funds without globe rating, target allocation funds, and funds in small fund families with less than 10 funds. Next, we analyze the relation between family rank in the interim assessment months and globe rating changes at the year-end. We find evidence of ESG tournament within fund families when the assessment month is April, May, June, or August, but not in March and July (See Table IA-3). The evidence is weaker than Table 3, which may be because we now include not only growth funds but also value and blend equity funds and fixed income funds. These funds may not choose ESG as a tool to compete with their peers.

We also look at how fund managers who engage in the globe chasing at the year-ends adjust E-, S-, and G-scores to affect the overall ESG scores and whether they actually improve carbon footprint. Funds with performance below (above) the median in most interim assessment months of a year are identified as "losers" ("winners") and focus on the "losers" ("winners") with increased globe ratings. We report the average changes of different measures from the month after the first interim assessment month to December (see Table IA-4). Overall, S-score has the greatest improvement on average among "losers" (1.115) and "winners" (1.008) with a globe rating increase at the year-ends. E- and G-score have a similar level of improvement among "losers"

(0.865 and 0.807) and "winners" (0.755 and 0.775). Using the principal adverse impacts measures defined by European Union Sustainable Related Financial Disclosure regulation, we investigate the changes of carbon emission aspects of the globe-chasing funds. We find that on average, "losers" and "winners" with increased globe ratings decrease the Green House Gas (GHG) scope 1 & 2 emissions (-5391.000 and -5331.000 Tonnes), but they have increased GHG scope 1 & 2 intensity on average (4.921 and 6.022 Tonnes). More "losers" (59.49 %) and "winners" (60.07%) have increased holding of firms lack carbon reduction policy (2.932% and 3.075%). Also, more "losers" (56.21%) and "winners" (54.73%) have increased holding of firms using fossil fuel to make revenues (0.225% and 0.378%). In short, globe-chasing funds make the largest improvement on social aspects, while their improvement on carbon footprint is limited or absent. Losing funds that are more likely to engage in tournament to obtain an increase in globe do not achieve a better impact on the environment than other funds. This suggests that the motivation of the increase in globe is not related to becoming greener but to agency considerations.

Finally, we consider whether the globe chasing behavior after the interim assessments can affect the fund performance at the year ends. We split funds into four groups in each year based on their performance in the interim month and December into "double-loser", "double-winners", "interim-losers", and "interim-winners". "Interim-losers" ("interim-winners") are funds with performance below (above) the median from January to the interim assessment month but above (below) the median from the interim assessment month to December. "Double losers" ("double-winners") are funds with performance below (above) the median in the two periods. Considering we have six interim assessment months, we set a fund into one of the four groups based on the

highest frequency. For each group, we use the propensity score matching to match funds experiencing globe rating increase at the year ends (treated group) with funds maintaining the globe ratings or experiencing globe rating decrease (control group). The outcome variables are (the percentile of) normalized cumulative returns in December, next-year January, and next-year February. Except "double winners" that show a weak difference in cumulative returns between treated and control group (0.255 vs. 0.364 with t-statistics equals -1.71), we do not find a significant difference in cumulative returns nor return percentiles among the four fund groups (see Table IA-5), implying that the globe chasing behavior does not improve performance and their ranks among peers on average. This finding is different from Gantchev et al. (2024), who report that funds with increased globe ratings suffer lower subsequent performance because of the overpriced ESG stocks in their portfolios during the first and half year following the release of globe rating. One possible reason of the difference is that the number of managers trading to improve globe ratings, as well as the extent of overpricing of ESG stocks, decreased after the first year as some managers recognized that ESG stocks negatively affect their overall fund performance. In the subsequent years, primarily "loser" funds[30] in the first part of the year participant in the globe chasing and their trading may not lead to substantial overpricing of ESG stocks[31].

[30] These "loser" funds differ from the funds with poor performance described in Gantchev et al. (2024), as the former with one or two globes have the strongest incentive to engage in globe-chasing, whereas the latter already possess high globe ratings.

[31] We observe a stronger negative relationship between past performance and globe rating after excluding the sample period covered by Gantchev et al. (2024), i.e., from October 2017 to December 2022.

7. Conclusion

Using the Morningstar Sustainability Rating (Globe Rating) for equity mutual funds, we examine whether US and European growth funds managers engage in tournament behaviors to earn fund flows. Given that one- and two-globe growth funds suffer from extra outflows and five-globe growth funds receive more inflows, we find that, among US growth funds, past "losers" in the interim assessments are more likely to increase Morningstar globe rating at the year-end than past "winners" to attenuate the impact of poor performance on fund flows and attract inflows from ESG investors. We also document that one-, two-, four-globe funds are the main participants in the ESG tournament. To receive higher globe ratings at the year-end, one-, two-, and four-globe funds prefer to sell non-ESG stocks and open new positions in ESG stocks into their portfolios. Investors respond to the ESG chasing behavior. One- or two-globe "losers" in interim and year-end assessments with an increase in globe suffer fewer outflows up to the next 12 months than those without a globe increase.

We also examine tournament in the Low Carbon Designation (LCD) issued by Morningstar. Whereas for the globes there were stronger results for the US, for the LCD there are stronger results for the European growth funds. They show a tournament on the LCD label: past "losers" are more likely to gain the LCD at the year-end than past "winners". Window dressing managers prefer low ESG and winning stocks and have lower globe ratings than their counterparts. However, four- and five-globe funds with portfolio sustainability scores close to the four-/five-globe breakpoint are more likely to engage in window dressing to achieve a globe upgrade or avoid downgrade.

Overall, this paper provides new evidence of managers affecting ESG ratings and the LCD label for agency considerations. Managers use the investors' awareness and popularity of ESG investing to attract their flows. We also provide novel evidence that ESG rating is another tool for mutual fund managers to use in their tournaments in addition to excess risk-taking behaviour shown in earlier tournament papers (e.g., Brown et al., 1996; Busse, 2001; Qiu, 2003; Gorieav et al., 2005; Schwarz, 2012). Although high ESG stocks may have lower downside risks (Hoepner et al., 2024), they are associated with lower expected returns (Bolton and Kacperczyk 2021 and Pastor et al. 2022). Furthermore, a high proportion of high ESG stocks may lead to a not well diversified portfolio. More in general, there is a concern that the fund manager's tilt to improve the ESG of the fund is initiated for agency considerations rather than with the goals of pursing the best interests of investors or to improve climate impact. One important implication of our study is that more accountability and transparency related to ESG investments may be required in the mutual fund industry.

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Table 1. Summary statistics of growth funds

This table shows the summary statistics of equity growth funds domiciled in US and Europe for which information on fund characteristics and Morningstar Sustainability Rating are available. Panel A covers all fund-month observations from March 2016 to December 2022. Panel B and C are for US and European growth funds, respectively. All variables are calculated in US dollars. We aggregate across share classes for funds with more than one share class. Fund size is the sum of the total net assets (in $ million) of all share classes. Fund flow is the dollar change in the monthly total net assets minus the price appreciation of fund assets over the month. We winsorize fund flows at 1% from the bottom and the top. Normalized flow is computed following Hartzmark and Sussman (2019), which is the flow percentile computed in each decile sorted by fund size. Fund age is number of years since funds' inception dates of the oldest share classes. MS star rating is the Morningstar Overall Rating for performance, ranging from 1 to 5 with 5 implies the top financial performer, updated monthly. MS globe rating is the Morningstar Sustainability Rating, ranging from 1 to 5 with 5 implies the top sustainability performer, updated monthly. Return is the net assets value-weighted average of monthly returns across share classes. Expense ratio is the net assets value-weighted average of the annual expense ratio across share classes. Turnover ratio is the net assets value-weighted average of the turnover ratio across share classes in the same funds. Turnover ratio is only reported for the US given the low coverage in Europe. Flow volatility is the standard deviation of fund flow in the past 12 months.

Panel A: 2,464 US and European growth funds

Variable	Obs.	Mean	Median	Std Dev.	Bottom 5%	Top 5%
Age (in years)	133,177	13.285	12.361	8.950	2.531	38.531
Fund Flow (% TNA per month)	131,539	0.052	-0.003	17.639	-0.117	1.206
Normalized Flow	131,539	0.521	0.519	0.289	0.045	0.998
MS Globe Rating	125,990	3.163	3.000	1.102	1.000	5.000
MS Star Rating	121,002	3.336	3.000	1.047	1.000	5.000
Fund Return (% per month)	130,548	0.986	1.420	5.599	-12.521	12.339
Past 12 months Flow Volatility	128,341	0.080	0.014	13.332	0.000	1.121
Expense Ratio (% per year)	119,842	1.114	1.038	0.405	0.199	1.951
Size (TNA in $ million)	131,798	1,420.810	270.520	4,780.590	16.285	15,261.040

Panel B: 865 US growth funds

Variable	Obs.	Mean	Median	Std Dev.	Bottom 5%	Top 5%
Age (in years)	61,545	15.887	14.784	8.289	4.077	39.975
Fund Flow (% TNA per month)	61,506	0.001	-0.007	1.475	-0.111	0.259
Normalized Flow	61,506	0.506	0.507	0.289	0.031	0.982
MS Globe Rating	59,245	3.155	3.000	1.054	1.000	5.000
MS Star Rating	61,054	3.243	3.000	1.026	1.000	5.000
Fund Return (% per month)	61,507	1.086	1.482	5.437	-12.021	12.409
Turnover (%)	50,858	58.311	42.000	0.636	50.500	252.429
Past 12 months Flow Volatility	61,478	0.043	0.011	1.816	0.001	0.525
Expense Ratio (% per year)	50,801	1.032	1.020	0.382	0.196	1.946
Size (TNA in $ million)	61,545	2550.100	595.100	6885.760	17.942	23,631.673

Panel C: 1599 European growth funds						
Variable	Obs.	Mean	Median	Std Dev.	Bottom 5%	Top 5%
Age (in years)	71,632	11.608	9.798	9.128	1.650	36.542
Fund Flow (% TNA per month)	70,033	0.093	0.000	23.573	-0.117	0.233
Normalized Flow	70,033	0.511	0.510	0.289	0.034	0.988
MS Globe Rating	66,745	3.170	3.000	1.140	1.000	5.000
MS Star Rating	59,948	3.420	3.000	1.059	1.000	5.000
Fund Return (% per month)	69,041	0.906	1.372	5.724	-12.893	12.093
Past 12 months Flow Volatility	66,863	0.118	0.0167	18.790	0.000	1.926
Expense Ratio (% per year)	69,041	1.228	1.056	0.431	0.203	1.959
Size (TNA in $ million)	70,253	556.748	172.408	1348.730	15.106	4534.130

Table 2. Fund flows and ESG globe ratings

This table shows the regression of monthly fund flows on fund ESG globe rating for US growth funds, US value and blend funds, European growth funds, and European value and blend funds. Independent variables are four dummy variables (one-globe, two-globe, four-globe, and five-globe), representing the fund's ESG rating issued by Morningstar each month. The dependent variable is the normalized fund flows following Hartzmark and Sussman (2019)'s calculation, which is the flow percentile computed in each decile sorted by fund size. Control variables include previous month funds' Morningstar Overall Rating (Star rating), previous month expense ratio, return, and the logarithm of size, the logarithm of fund age, and cumulative returns of prior 12 and 24 months. We also add the year-MS category-month fixed effect and country fixed effect. Statistical significance of 10%, 5%, and 1% is denoted by *, **, and ***, respectively. T-statistics are not reported for the control variables. Standard errors are clustered at the year-Morningstar category-month level. The sample period is from March 2016 to December 2022.

Regression of fund flows on ESG rating				
	US growth funds	US value and blend funds	European growth funds	European value and blend funds
	Dependent variable: Normalized fund flows			
One-globe	-3.434***	-0.628	-2.920***	-0.739
T-stat.	(-4.64)	(-1.44)	(-4.07)	(-1.39)
Two-globe	-1.601***	0.147	-1.382***	0.534
T-stat.	(-4.46)	(0.21)	(-3.11)	(0.98)
Four-globe	0.405	0.429	0.620	0.646
T-stat.	(0.98)	(1.12)	(1.22)	(1.27)
Five-globe	1.920***	0.971**	0.840*	1.053**
T-stat.	(3.83)	(2.50)	(1.75)	(2.23)
Intercept	58.445***	65.338***	57.812***	53.827***
Star rating	6.872***	5.303***	2.632***	1.374***
Age	-1.386***	-7.947***	-4.270***	-3.295***
Expense Ratio	-6.249***	-7.835***	-2.350**	-0.209*
Size	-1.239***	-2.384***	-0.521**	-0.434***
Return volatility	-0.104	-0.314	-0.136	-0.194
Flow volatility	-1.305***	0.914***	1.751***	-0.385***
Previous month return	0.267	-0.165	0.607***	0.255*
Cum_Ret prior 12 months	1.735***	3.545***	3.525***	3.215***
Cum_Ret prior 24 months	2.855***	3.698***	2.155***	2.997***
Year-Category-Month SE	Yes	Yes	Yes	Yes
Country FE	No	No	Yes	Yes
Year-Category-Month FE	Yes	Yes	Yes	Yes
Obs.	49,161	97,350	35,632	85,736
Adjusted R-squared	0.168	0.136	0.118	0.078

Table 3. Proportion of past losers and winners with increased globe rating

This table shows the numbers and proportions of growth funds with increased globe rating after the interim performance assessment in US and Europe. We set the interim assessment month from March to August. (M, 12-M) indicates that the interim assessment occurs in month M, and there are 12-M months left for managers until the year-end. We calculate fund performance as the fund's cumulative returns from January to the assessment month and normalize them using the Morningstar category and date by subtracting the category cumulative return and dividing by the category standard deviation. We then divide funds into "losers" and "winners" based on the median fund performance at each assessment month. In the first column, the number before "/" is the number of "losers" with increased globe ratings at the year-end and the number after "/" is the total number of losers. The second column is the same format but for "winners." The third and fourth columns represent the proportions of "losers" and "winners," with increased globe ratings out of all "losers" and "winners." The fifth column shows the difference between the two previous proportions. Panel A includes all funds with increased globe rating. Panel B only includes funds with increased from one or two globes to higher globes. Panel C only includes funds with increased to five globes from other globes. The P-value is the probability of the *z*-test that the proportional difference between two samples does not have statistical significance. Statistical significance of 10%, 5%, and 1% is denoted by *, **, and ***, respectively. The sample period is from April 2016 to December 2022. We exclude 2019 due to Sustainalytics rating change.

Panel A: Number & proportion of "losers" and "winners" with increased ESG rating

(M, 12-M)	Number		Proportion		Proportion	*z*-test
	Loser	Winner	Loser	Winner	Difference	P-value
(March, 9 months)	681/3,495	529/3,417	19.48%	15.48%	4.00%***	<0.0001
(April, 8 months)	794/4,055	665/4,012	19.58%	16.58%	3.01%***	0.0004
(May, 7 months)	748/4,075	623/4,040	18.36%	15.50%	2.94%***	0.0004
(June, 6 months)	674/4,169	531/4,098	16.17%	12.96%	3.21%***	<0.0001
(July, 5 months)	613/4,227	490/4,173	14.50%	11.74%	2.76%***	0.0002
(August, 4 months)	570/4,256	449/4,198	13.39%	10.70%	2.70%***	0.0001

Panel B: Funds with increased from one or two globes to higher globes

(M, 12-M)	Number		Proportion		Proportion	*z*-test
	Loser	Winner	Loser	Winner	Difference	P-value
(March, 9 months)	249/773	174/893	32.21%	19.48%	12.73%***	<0.0001
(April, 8 months)	315/1,001	221/1,075	31.47%	20.56%	10.91%***	<0.0001
(May, 7 months)	283/979	225/1,111	28.91%	20.25%	8.66%***	<0.0001
(June, 6 months)	240/1,002	184/1,078	23.95%	17.07%	6.88%***	<0.0001
(July, 5 months)	223/1,061	157/1,065	21.02%	14.74%	6.28%***	0.0002
(August, 4 months)	216/1,070	152/1,124	20.19 %	13.52%	6.66%***	<0.0001

Panel C: Funds with increased to five globes from other globes						
(M, 12-M)	Number		Proportion		Proportion	*z*-test
	Loser	Winner	Loser	Winner	Difference	P-value
(March, 9 months)	134/2,990	105/3,008	4.48%	3.49%	0.99%**	0.048
(April, 8 months)	142/3,498	114/3,548	4.06%	3.21%	0.85%*	0.057
(May, 7 months)	121/3,552	106/3,544	3.74%	2.99%	0.75%*	0.077
(June, 6 months)	133/3,640	100/3,586	3.65%	2.78%	0.87%**	0.037
(July, 5 months)	117/3,720	92/3,635	3.15%	2.53%	0.61%	0.113
(August, 4 months)	88/3,709	80/3,675	2.37%	2.18%	0.20%	0.573

Table 4. Past performance and future Morningstar globe ratings

This table reports regressions of the globe difference between December and the interim assessment month on past performance. We consider six assessment months (March to August). Panel A reports the results for US and European growth funds, and Panel B reports the results for US growth funds. (M, 12-M) indicates that the interim assessment occurs in month M, and there are 12-M months left for managers until the year-end. The Independent variable is the cumulative return from January to the assessment month, which is normalized by Morningstar fund category and date by subtracting the category cumulative return and dividing by the category standard deviation. Control variables include previous month expense ratio, turnover ratio, star rating, and the logarithm of fund size, funds' globe rating in assessment month M, the logarithm of fund age, fund risk, and flow volatility. Turnover ratio is only added for US growth funds since most turnover among European funds is missing. Fund risk is measured as the standard deviation of returns in the months after the assessment month until the year end. Flow volatility is the standard deviation of flows in the past 12 months. We also controlled for the MS category-year fixed effect and country fixed effect. Standard errors are clustered at the fund level. Statistical significance of 10%, 5%, and 1% is denoted by *, **, and ***, respectively. The sample period is from April 2016 to December 2022. We exclude 2019 due to Sustainalytics rating change.

Panel A: Regression of globe rating change on past performance for US and Europe growth funds						
Dependent variable: Difference of globe rating between December and the assessment month						
(M, 12-M)						
(March, 9 months)	-0.041***					
T-stats.	(-4.23)					
(April, 8 months)		-0.044***				
T-stats.		(-4.86)				
(May, 7 months)			-0.041***			
T-stats.			(-4.76)			
(June, 6 months)				-0.038***		
T-stats.				(-4.47)		
(July, 5 months)					-0.031***	
T-stats.					(-3.77)	
(August, 4 months)						-0.038***
T-stats.						(-4.99)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Year-Category FE	Yes	Yes	Yes	Yes	Yes	Yes
Fund SE	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	5,468	6,411	6,430	6,578	6,695	6,713
Adj. R-squared	0.131	0.137	0.134	0.116	0.104	0.105

Panel B: Regression of globe rating change on past performance for US growth funds						
Dependent variable: Difference of globe rating between December and the assessment month						
(M, 12-M)						
(March, 9 months)	-0.049***					
T-stats.	(-4.07)					
(April, 8 months)		-0.061***				
T-stats.		(-4.67)				
(May, 7 months)			-0.053***			
T-stats.			(-4.24)			
(June, 6 months)				-0.051***		
T-stats.				(-4.27)		
(July, 5 months)					-0.039***	
T-stats.					(-3.50)	
(August, 4 months)						-0.049***
T-stats.						(-4.29)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year-Category FE.	Yes	Yes	Yes	Yes	Yes	Yes
Fund SE	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	2,937	3,430	3,396	3,469	3,543	3,515
Adj. R-squared	0.124	0.139	0.145	0.113	0.094	0.110

Table 5. Past performance and future Morningstar globe rating at each globe level

This table summarizes the results of piecewise linear regressions of the globe difference between December and the interim assessment month on past performance conditional on globe ratings for US growth funds. We consider six assessment months (March to August). (M, 12-M) indicates that the interim assessment occurs in month M, and there are 12-M months left for managers until the year-end. The independent variables are five interactions of past normalized cumulative returns with globe rating in assessment month M. Control variables include previous month expense ratio, turnover ratio, star rating, and the logarithm of fund size, the logarithm of fund age, fund risk, and flow volatility. Fund risk is measured as the standard deviation of returns in the months after the assessment month until the year-end. Flow volatility is the standard deviation of flows in the past 12 months. We also controlled for the MS category-year fixed effect. Standard errors are clustered at the fund level. Statistical significance of 10%, 5%, and 1% is denoted by *, **, and ***, respectively. The sample period is from April 2016 to December 2022. We exclude 2019 due to Sustainalytics rating change.

Piecewise regression of globe rating change on past performance									
Dependent variable: Difference of Globe Rating between December and the assessment month									
Independent variables: Cumulative returns in M*Globe									
(M, 12-M)	One	Two	Three	Four	Five	Controls	FE&SE	Obs.	Adj R-squared
(March, 9)	-0.113***	-0.085***	-0.015	-0.037	-0.021	Yes	Yes	2,937	0.128
T-stats.	(-3.92)	(-2.99)	(-0.66)	(-1.30)	(-0.69)				
(April, 8)	-0.131***	-0.095***	-0.009	-0.056***	-0.004	Yes	Yes	3,430	0.149
T-stats.	(-3.75)	(-3.39)	(-0.38)	(-2.60)	(-0.13)				
(May, 7)	-0.049*	-0.149***	-0.0218	-0.023	-0.021	Yes	Yes	3,396	0.158
T-stats.	(-1.96)	(-6.31)	(-1.01)	(-0.87)	(-0.57)				
(June, 6)	-0.029	-0.113***	-0.011	-0.046**	0.014	Yes	Yes	3,512	0.121
T-stats.	(-1.26)	(-4.89)	(-0.56)	(-2.02)	(0.49)				
(July, 5)	-0.057***	-0.081***	-0.002	-0.040*	0.007	Yes	Yes	3,543	0.097
T-stats.	(-2.75)	(-3.51)	(-0.08)	(-1.71)	(0.24)				
(August, 4)	-0.054**	-0.094***	-0.035*	-0.036	-0.024	Yes	Yes	3,515	0.114
T-stats.	(-2.21)	(-4.38)	(-1.65)	(-1.45)	(-0.89)				

Table 6. Past performance and future Morningstar globe rating at each globe level: winners vs losers

This table summarizes the results of piecewise linear regressions of the globe difference between December and the interim assessment month on interactions of performance dummies with globe dummies for US growth funds. We consider six assessment months (March to August). (M, 12-M) indicates that the interim assessment occurs in month M, and there are 12-M months left for managers until the year-end. We calculate fund performance as the fund's cumulative returns from January to the assessment month and normalized by Morningstar fund category and date by subtracting the Morningstar category cumulative return and dividing by the category standard deviation. We then divide funds into "losers" and "winners" based on the median performance of their fund category. The constructed ten interactions of each globe level with each performance dummy (5x2). We include 8 interaction variables as independent variables. The omitted groups are three-globe "winners" and five-globe "losers", which have insignificant relations with future globe rating. Control variables include previous month expense ratio, turnover ratio, star rating, and the logarithm of fund size, the logarithm of fund age, fund risk, and flow volatility. Fund risk is measured as the standard deviation of returns in the months after assessment month until the year-end. Flow volatility is the standard deviation of flows in the past 12 months. We also controlled for the MS category-year fixed effect. Standard errors are clustered at the fund level. Statistical significance of 10%, 5%, and 1% is denoted by *, **, and ***, respectively. The sample period is from April 2016 to December 2022. We exclude 2019 due to Sustainalytics rating change.

Piecewise regression of globe rating change on past performance and globe rating										
Dependent variable: Difference of globe rating between December and the assessment month										
	Independent variables: Globe*Loser (Winner)									
	One		Two		Three	Four		Five	Obs.	Adj R-squared
(M,12-M)	Losers	Winners	Losers	Winners	Losers	Losers	Winners	Winners		
(March, 9)	0.152*	0.070	0.142**	0.009	0.054	0.091*	-0.061	-0.007	2,940	0.126
T-stats.	(1.87)	(0.76)	(2.36)	(0.16)	(1.32)	(1.95)	(-1.48)	(-0.11)		
(April, 8)	0.320***	0.089	0.207***	-0.046	0.082**	0.193**	-0.055	0.024	3,471	0.133
T-stats.	(2.81)	(0.88)	(3.52)	(-0.73)	(2.08)	(2.05)	(-1.42)	(0.36)		
(May, 7)	0.230***	0.041	0.215***	-0.070	0.023	0.069*	-0.053	-0.082	3,435	0.143
T-stats.	(2.78)	(0.43)	(3.66)	(-1.05)	(0.66)	(1.79)	(-1.36)	(-1.53)		
(June, 6)	0.190**	0.105	0.214***	-0.030	0.056*	0.092**	-0.025	0.021	3,512	0.116
T-stats.	(2.11)	(1.23)	(3.58)	(-0.50)	(1.70)	(1.99)	(-0.63)	(0.35)		
(July, 5)	0.189**	0.024	0.136**	-0.043	0.043	0.048	-0.004	0.044	3,592	0.099
T-stats.	(2.23)	(0.27)	(2.48)	(-0.75)	(1.35)	(1.41)	(-0.10)	(0.82)		
(August, 4)	0.255***	0.050	0.135***	-0.013	0.05*	0.081*	-0.045	0.023	3,561	0.124
T-stats.	(2.89)	(0.63)	(2.62)	(-0.25)	(1.67)	(1.89)	(-1.24)	(0.44)		

Table 7. Stock level analysis

This table displays the regression results of globe difference on the quarterly position changes for different type of stocks. The globe difference is computed between December and the interim assessment month. The quarterly position changes are computed for the first full reporting quarter after the assessment month in six stock groups interacted with five globe dummies for US growth funds. We focus on "loser" funds that experienced globe rating increase. We also include "loser" funds that stayed at three and five globes, which have the incentive to keep the globe levels to avoid downgrade. Using stock's ESG (risk) score and peer group provided by Sustainalytics, we define ESG stocks as stocks whose ESG (risk) scores are higher (lower) than the peer group. The rest of stocks with non missing ESG data are defined as non-ESG stocks. No-ESG assets are defined as stocks with missing ESG information or non equity securities. We further divide the three stock types into existing stocks (stocks that were also held in the previous quarter) and new added stocks (new stocks). A fund position change is the sum of the position changes of one type of stock. We include change of ESG levels of stocks (the difference between stock's ESG score and its peer average) held by a fund computed during the same quarter as the quarterly position changes. Other control variables include the logarithm of fund age, expense ratio, turnover ratio, the logarithm of fund size, flow volatility, fund risk in the past 6 months, and fund returns in the past 3 and 6 months. Flow volatility is the standard deviation of flows in the past 12 months. Risk is the standard deviation of returns over the past 6 months. We control for the year-MS category-month fixed effect. Standard errors are clustered at the fund level. Statistical significance of 10%, 5%, and 1% is denoted by *, **, and ***, respectively. The sample period is from April 2016 to December 2022. We exclude 2019 due to Sustainalytics rating change.

Regression of globe difference on quarterly position change of different type of stocks						
Dependent variable: Difference of globe rating between December and the interim assessment month of "loser" funds						
Independent variables	Existing ESG stocks	New ESG stocks	Existing non-ESG stocks	New non-ESG stocks	Existing no-ESG assets	New no-ESG assets
Position change*Globe 1	-0.686	3.252***	-0.716*	0.688	-2.125***	0.581
T-stat.	(-1.07)	(4.45)	(-1.83)	(1.52)	(-2.48)	(1.62)
Position change*Globe 2	-0.418	0.812***	-0.441**	0.644	-0.692*	0.372
T-stat.	(-1.18)	(2.83)	(-2.41)	(1.47)	(-1.94)	(1.35)
Position change*Globe 3	-0.015	0.788*	-0.110	-0.747	-0.482	0.275
T-stat.	(-0.40)	(1.76)	(-1.30)	(-1.58)	(-1.62)	(1.21)
Position change*Globe 4	0.217	1.102***	-0.246**	-0.381	-0.739	0.224
T-stat.	(1.43)	(3.78)	(-2.11)	(-1.28)	(-0.99)	(0.26)
Position change*Globe 5	0.027	0.678***	0.271	-0.283	0.436	0.235
T-stat.	(0.51)	(3.11)	(1.18)	(-0.42)	(1.11)	(0.58)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fund SE	Yes	Yes	Yes	Yes	Yes	Yes
Year-Category-Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	5,287	2,946	5,247	2,706	4,873	2,354
Adjusted R-squared	0.213	0.277	0.211	0.213	0.285	0.201

Table 8. Flow response after "double losers" with increased globe ratings

This table displays flow changes before and after a globe rating increase of one- and two-globe "double losers" funds for the US growth funds. We aggregate the cases where "double losers" experience globe rating increase from April (after the first interim assessment month) to the year-end. In Panel A our outcome variable is the difference between the 3-month compounded (normalized) flows computed at the end of February in the next year and the 3-month flows computed at the month before the globe increase. Normalized fund flows are computed following Hartzmark and Sussman (2019)'s calculation, which is the flow percentile computed in each decile sorted by fund size. We exclude cases when funds experience an increase in globe rating but drop again before next year February. We first calculate the propensity score for each "double loser" at the month they experience a globe increase (hereafter "globe-increasing month"). For each one- or two-globe "double loser" with an increased globe (treated group), a matching "double loser(s)" without an increased globe (control group) in the same period is identified as the funds with the closest propensity score to the "double loser" with an increased globe. The propensity score is computed using logit regressions. The control variables in propensity score matching include the turnover ratio, expense ratio, logarithm of the total net asset, Morningstar Overall Rating in the globe-increasing month, logarithm of fund age, compounded fund flows from January to the globe-increasing month, performance rank before and after globe-increasing month, and standard deviation of returns measured as fund risk before and after globe-increasing month, flow volatility in the past 12 months, Morningstar category dummies, and year-month dummies. Based on the treatment group in Panel A, we further select among the "loser" funds (with below median performance) one- or two-globe "double losers" whose cumulative performance is below the median in the next 6 months in Panel B or 12 months in Panel C. We exclude cases where globe ratings are downgraded in the next 6 months (12 months). The control group is the "double losers" that remain in one or two globes in the same period. We calculate past 6-month and 12-month compounded (normalized) flows before and starting from the globe-increasing month, and this flow difference is the outcome variable for the treated group. Outcome variable for control group is the flow differences for the "double loser(s)" computed using the same months as the outcome variable in the matched treated group. We add 6-month (12-month) cumulative performance difference before and after the globe-increasing month to the control variables into the logit regression. We use the *t*-test to analyze whether significant differences in compounded (normalized) flow changes exist. The last column in each panel is the number of matched "double losers" in the treated and control groups in each assessment period. Statistical significance of 10%, 5%, and 1% is denoted by *, **, and ***, respectively. The sample period is from April 2016 to December 2022. We exclude 2019 due to Sustainalytics rating change.

Propensity Score Matching in "loser" managers					
Treatment: Increase globe rating from low globes to high globes after the assessment					
Panel A: Outcome variable: Changes of 3-month compounded flows computed in February and the month before the globe-increasing month					
	Matched sample				
	Treated	Control	Difference	T-statistics	No. Treated/No. Untreated
Compounded flows	-0.028	-0.047	0.019	2.17**	260/758
Compounded normalized flows	-0.227	-0.478	0.251	2.21**	260/758
Panel B: Outcome variable: Changes of 6-month compounded flow before and starting from the globe-increasing month					
Compounded flows	-0.009	-0.081	0.090	2.32**	223/586
Compounded normalized flows	-12.201	-14.142	1.941	1.95*	223/586
Panel C: Outcome variable: Changes of 12-month compounded flow before and starting from the globe-increasing month					
Compounded flows	-0.079	-0.163	0.084	1.87*	196/523
Compounded normalized flows	-242.075	-253.349	11.274	0.08	196/523

Table 9. ESG and window-dressing behavior

This table displays in Panel A time series cross sectional average of the portfolio proportions invested in different types of stocks, the globe rating, and the quarterly return for funds with the greatest and least probability of window dressing. We measure window dressing using the *Backward holding return gap (BHRG)* (Agarwal et al., 2014) measure, which is defined as the difference between the quarterly return of disclosed fund end of quarter's holdings and fund's actual quarterly return. We look at the funds with top 30% (20%) of value of BHRG, representing the funds with the greatest probability of window dressing, and bottom 30% (20%) of BHRG, representing the funds with the least probability of window dressing. % of ESG (ESG winner) is the percentage of (winning) stocks with high ESG scores and % of non-ESG (non-ESG winner) is the percentage of (winning) stocks with low ESG scores. Following Agarwal et al. (2014), we create quintiles of all US stocks in CRSP stock database by sorting stocks in descending order based on their past 3 months returns. Winning (losing) stocks are defined as stocks in the 1st (5th) quintile, i.e., stocks achieve the highest (lowest) returns. We define a high ESG score if a stock' ESG is higher than its peer group provided by Sustainalytics. We use the *t*-test to analyze whether significant differences in percentage exist. Panel B displays the regression results of BHRG on previous fiscal quarter globe rating and controls. Control variables are previous fiscal quarter expense ratio, turnover rate, star rating, and the logarithm of fund size, the logarithm of age, flow volatility, past 6 months risk, past 3- and 6-month cumulative returns. We also controlled for the fiscal year-MS category-fiscal quarter fixed effect. Standard errors are clustered at the fund level. Panel C displays the comparison of BHRG for four- and five-globe funds with different globe rating changes after the first assessment month till the fiscal year-end. The fourth column compared the BHRG differences between two groups followed with P-value of *t*-test in the fifth column. Panel D displays the comparison of BHRG for four- and five-globe funds with portfolio sustainability scores around breakpoints and their counterparts after the first assessment month till the fiscal year-end. Four-globe funds are divided into quartiles: 1st quantile (closest to three-/four-globe breakpoint), 2nd and 3rd quartile (in the middle), and 4th quantile (closest to four-/five-globe breakpoint). Five-globe funds are divided into two groups: lower than median (close to four-/five-globe breakpoint) and higher than median (of five-globes' sustainability scores). Statistical significance of 10%, 5%, and 1% is denoted by *, **, and ***, respectively. The sample period is from April 2016 to December 2022. We exclude September to November 2019 due to Sustainalytics rating change.

Panel A: Proportions of ESG and winning stocks in Window-dressing funds

Variables	Top 30% of BHRG	Bottom 30% of BHRG	Difference	P-value
% of ESG winners	12.935	16.919	-4.141***	<0.0001
% of non-ESG winners	18.236	9.225	8.956***	<0.0001
% of ESG	34.978	58.487	-23.935***	<0.0001
% of non-ESG	45.235	27.353	17.907***	<0.0001
% of winners	37.189	27.899	9.031***	<0.0001
% of losers	14.079	10.298	3.760***	<0.0001
Globe rating	2.863	3.383	-0.522***	<0.0001
Fund quarterly return (%)	0.956	1.222	-0.331***	0.004
BHRG (%)	1.748	0.330		
Variables	Top 20% of BHRG	Bottom 20% of BHRG	Difference	P-value
% of ESG winners	12.666	16.779	-4.267***	<0.0001
% of non-ESG winners	19.262	9.017	10.193***	<0.0001
% of ESG	32.819	59.123	-26.703***	<0.0001
% of non-ESG	46.678	26.585	20.143***	<0.0001
% of winners	38.905	27.447	11.213***	<0.0001
% of losers	14.472	10.157	4.294***	<0.0001
Globe rating	2.788	3.429	-0.642***	<0.0001
Fund quarterly return (%)	0.919	1.251	-0.394***	0.001
BHRG (%)	2.042	0.265		

Panel B: Regression of window dressing measure on globe rating	
Dependent variable	BHRG
Lag (Globe rating)	-0.001***
T-statistics	(-5.11)
Controls	Yes
Fund SE	Yes
Fiscal year-Category-Fiscal quarter FE	Yes
Obs.	8,111
Adjusted R-squared	0.238

Panel C: Window dressing levels and globe chasing					
Current globe rating	Globe rating at the fiscal year-end	BHRG (%)	BHRG differences	P-value	Obs.
Four-globe	1. Five-globe	0.634	Difference with 2.: -0.220***	<0.0001	354
	2. Four-globe	0.850	Difference with 3.: -0.062**	0.036	3,921
	3. Three-globe	0.912	Difference with 1.: -0.278***	<0.0001	949
Five-globe	1. Five-globe	0.606	Difference with 2: -0.083**	0.022	1,844
	2. Three- /Four-globe	0.689			450

Panel D: Window dressing levels and funds with ESG scores around globe breakpoints						
Current globe	Current ESG score position	Globe in the fiscal year-end	BHRG (%)	BHRG differences	P-value	Obs.
Four	4th quartile (Closer to four-/five-globe breakpoint)	Five	0.772	Difference with 2nd & 3rd quartiles: 0.213***	0.006	109
	2nd &3rd quartile (middle)		0.559			247
	4th quartile (Closer to four-/five-globe breakpoint)	Four	0.986	Difference with 2nd &3rd quartiles: 0.258***	<0.0001	1,077
	2nd &3rd quartile (middle)		0.728			2,111
	1st quartile (Closer to three-/four-globe breakpoint)		0.739	Difference with 2nd &3rd quartiles: -0.011	0.781	384
Five	Lower than the median of ESG score of five-globe funds (Closer to four-/five-globe breakpoint)	Five	0.662	Difference with the group with higher than the median of ESG score: 0.109***	0.004	735
	Higher than the median of ESG score of five-globe funds		0.553			814

Table 10. The effect of low carbon designation on growth fund flows.

Panel A shows the regression results of growth fund flows in US and Europe on the low carbon designation (LCD). In column (1) and (3), the independent variable is a dummy variable, equals to one if the fund has an LCD. Dependent variable is the normalized fund flow following Hartzmark and Sussman (2019). Control variables include the changes of star and globe ratings, previous month expense ratio, return, and the logarithm of size, the logarithm of fund age, and cumulative returns of prior 12 and 24 months. In column (2) and (4) we replace the independent variable with five interaction terms of LCD and globe rating. We add the year-Morningstar category-month fixed effect and country fixed effect. Standard errors are clustered at the year-Morningstar category-month level. Panel B and C show the numbers and proportions of growth fund managers gaining LCD after the interim performance assessment in US and European growth funds, respectively. The interim assessment months range from March to August. We divide funds into "losers" and "winners" based on the median performance of funds in the same Morningstar category. In the first column, the numbers before "/" are the numbers of losers gaining LCD at the year-end and the number after "/" is the total number of losers. The second column is the same format but for winners. The third and fourth columns represent the proportions of losers and winners, gaining LCD out of all losers and winners. The fifth column shows the difference between the two previous proportions. P-value is the probability of the *z*-test that the proportional difference between two samples does not have statistical significance. Statistical significance of 10%, 5%, and 1% is denoted by *, **, and ***. The sample period is from April 2018 to December 2022.

Panel A: Regression of growth fund flows on Low Carbon Designation (LCD)				
	US Growth funds		Europe Growth funds	
	(1)	(2)	(3)	(4)
LCD	-0.014***		0.018***	
T-statistics	(-2.59)		(4.02)	
LCD* One-globe		-0.022**		-0.001
LCD* Two-globe		-0.038***		-0.007
LCD* Three-globe		-0.027***		0.025***
LCD* Four-globe		-0.008		0.033***
LCD* Five-globe		0.016**		0.034***
ΔStar rating	0.006*	0.008**	0.009***	0.011***
ΔGlobe rating	0.002**	0.003	-0.004	0.004
Age	-0.030***	-0.036***	-0.046***	-0.047***
Expense Ratio	-0.040***	-0.040***	-0.027**	-0.021*
Size	-0.013***	-0.013***	0.006**	0.006***
Return volatility	-0.007***	-0.007**	-0.004**	-0.004*
Flow volatility	-0.135***	-0.0134***	0.014***	0.015
Return in the last month	0.005**	0.006***	0.007***	0.007**
Cum_Ret prior 12 months	0.038***	0.034***	0.034***	0.034***
Cum_Ret prior 24 months	0.051***	0.052***	0.035***	0.035***
Intercept	0.739***	0.748***	0.638***	0.591
Year-Category-Month SE	Yes	Yes	Yes	Yes
Country FE	No	No	Yes	Yes
Year-Category-Month FE	Yes	Yes	Yes	Yes
Obs.	30,654	30,654	30,025	30,025
Adjusted R-squared	0.107	0.086	0.111	0.092

Panel B: European Growth Fund managers with LCD at the year-end						
(M, 12-M)	Number		Proportion		Proportion	*z*-test
	Loser	Winner	Loser	Winner	Difference	P-value
(March, 9 months)	223/1819	202/1818	12.26%	11.11%	1.15%	0.281
(April, 8 months)	232/1802	198/1817	12.88%	10.90%	1.98%*	0.066
(May, 7 months)	257/2230	219/2254	11.53%	9.72%	1.81%**	0.049
(June, 6 months)	199/2316	130/2309	8.59%	5.63%	2.96%***	<0.0001
(July, 5 months)	190/2317	139/2320	8.20%	5.99%	2.21%***	0.003
(August, 4 months)	188/2317	141/2320	8.11%	6.08%	2.04%***	0.007

Panel C: US Growth Fund managers with LCD at the year-end						
(M, 12-M)	Number		Proportion		Proportion	*z*-test
	Loser	Winner	Loser	Winner	Difference	P-value
(March, 9 months)	116/1382	66/1377	8.39%	4.79%	3.60%***	<0.0001
(April, 8 months)	123/1377	59/1382	8.93%	4.27%	4.66%***	<0.0001
(May, 7 months)	141/1754	70/1764	8.04%	3.97%	4.08%***	<0.0001
(June, 6 months)	107/1744	52/1776	6.13%	2.93%	3.21%***	<0.0001
(July, 5 months)	111/1755	48/1765	6.33%	2.72%	3.61%***	<0.0001
(August, 4 months)	105/1762	54/1758	5.96%	3.07%	2.89%***	<0.0001