ESG INVESTING AND MUTUAL FUND MANAGER BEHAVIOR

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I explore whether managers of Environmental, Social, and Governance (ESG) funds differ in their disclosure behavior as compared with conventional fund managers. Prior studies suggest that investors of ESG funds have long-term investment horizons, thereby encouraging fund managers to be less concerned about their quarterly portfolio disclosure. Using a database of third-party sustainability score of mutual funds, I find that funds that rank high on the score carry out less portfolio window dressing. Further, I provide evidence that ESG fund managers use long-term performance metrics in their investment decisions, aligned with their clients' long-term investment horizons. Moreover, I find that the heterogeneity in disclosure behavior is not due to the endogenous allocation of fund managers to ESG funds.

BIOGRAPHICAL SKETCH

Manuela Moura Dantas was born in Rio de Janeiro, Brazil, on October 24, 1985. She received her undergraduate degree in Accounting from Universidade Federal do Rio de Janeiro (UFRJ), Brazil, in 2011. She had a brief career in the financial services industry, serving as a financial analyst at Banco Modal. Prior to her doctoral studies at Cornell, she also pursued an M.S. in Finance from Fundação Getulio Vargas (FGV). She will join the David Nazarian College of Business and Economics of the California State University Northridge as an assistant professor in the Fall semester of 2019.

To Helena Grigorowski

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CHAPTER 1

ESG INVESTING AND MUTUAL FUND MANAGER BEHAVIOR

1.1 Introduction

The advent of Environmental, Social, and Governance (ESG) investing[1] is arguably one of the most significant innovations in the asset management industry in recent years. In 2017, funds employing variants of ESG criteria comprised approximately $95 billion of assets under management – representing an astonishing increase of nearly 60% from the previous year (see Figure 1.1). BlackRock, the world's largest investment management company, recently announced that the company will from now on require its fund managers to consider ESG criteria in their investment decision-making process[2]. The surge in popularity of ESG Investing – once considered a niche investment philosophy – is increasingly drawing the attention of practitioners and scholars, fostering an important debate on whether socially responsible investment vehicles can competitively yield financial returns to their investors in the face of additional constraints in portfolio holdings and investment strategies vis-à-vis conventional (non-ESG) funds (e.g., see El Ghoul and Karoui, 2017, Fabozzi et al., 2008, Hong and Kacperczyk, 2009).

Despite the increasing relevance of ESG[3] in the mutual fund industry, our understanding of the specific mechanisms that separate ESG fund managers from their con-

[1] What constitutes an acceptable set of ESG criteria is subjective and each fund applies its own set of ESG criteria. Environmental criteria examine how firms deal with their negative environmental externalities, such as energy use, waste, pollution, and natural resource conservation. Social criteria examine the firms' relationship with their stakeholders, such as employees, suppliers, customers, and local communities. The governance criteria examine the firms' internal controls, executive pay, shareholder rights, etc.

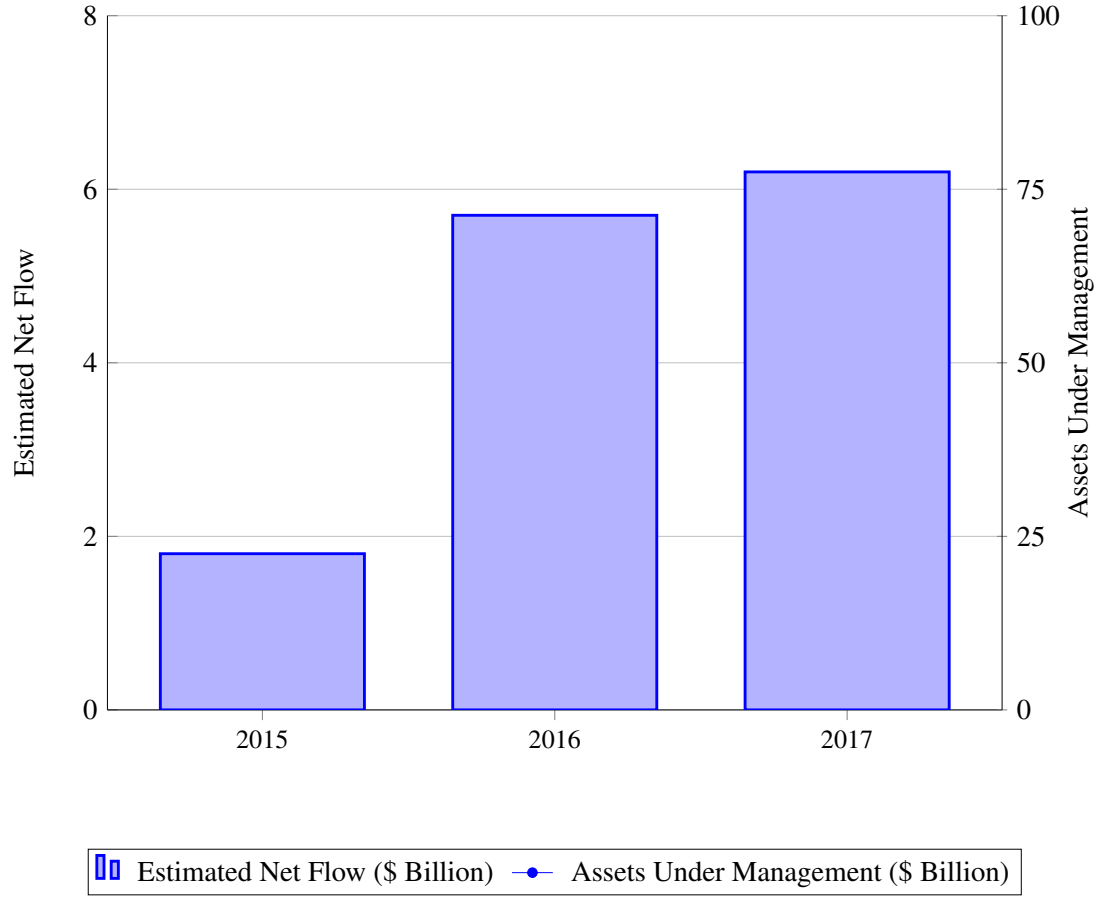
[2] For more details, see http://lipperalpha.financial.thomsonreuters.com/2018/08/monday-morning-memo-has-esg-gone-mainstream/

[3] The terms *ESG funds*, *Socially Responsible funds*, and *Sustainable funds* are often used interchangeably.

ventional counterparts is limited. For instance, although we know about the impact that the behavior of mutual fund managers has on the performance of funds (Agarwal et al., 2014, Chevalier and Ellison, 1997, 1999a, Cremers and Pareek, 2016), we do not know if the investment decisions of managers of ESG funds differ from the decisions of managers of conventional funds regarding portfolio disclosure, investment choices, and investment horizon. Theoretical work in the area shows that investors may be willing to pay a premium to have socially responsible investments and should invest with a long-term perspective (Gollier and Pouget, 2014, Heinkel et al., 2001). Consistent with the hypothesis of longer investment horizons, empirical studies demonstrate that capital flows of socially responsible funds are less sensitive to past negative returns (Bollen, 2007, Renneboog et al., 2011). However, can the investment philosophy of investors' clientele determine the behavior of fund managers? Even assuming that the temporal preferences of investors would create implicit incentives for managers to have longer investment horizons, incentive alignment cannot be assumed, as managers of ESG funds have a compensation structure based on their quarterly or annual financial performance similar to that of conventional fund managers.

In this paper, I explore how the investment horizon of investors of ESG funds translates to the behavior of the managers of such funds. Specifically, I analyze the disclosure activities of portfolio managers of ESG mutual funds. Open-end mutual funds are required, under SEC regulation, to report a complete list of their holdings on a quarterly basis. I am interested in investigating the opportunistic practices that derive from the excessive focus on short-term developments (short-termism). My focus on managers' behavior is motivated by prior work that suggests that implicit incentives generated by career concerns affect managers' behavior and, as a consequence, funds' performance (Chevalier and Ellison, 1999a) and by studies that suggest that the short-termism of institutional investors encourages myopic corporate behavior by putting pressure on

Figure 1.1 ESG Funds Flows and Assets Under Management (AUM)



Source: Morningstar Direct

managers of investee firms to place excessive focus on short-term projects (Agarwal et al., 2017, Bushee, 1998). The underlying premise is that investors of ESG funds, by focusing on long-term results, alleviate the pressures and incentives that induce fund managers to consistently report superior returns in the short run. Consequently, fund managers become less reluctant to produce quarterly reports that demonstrate that holdings of stocks have experienced sharp performance declines in the short-term.

To specifically examine whether ESG funds managers have different disclosure behavior from their peers, I focus on portfolio window dressing, which is the fund managers' attempt to distort their portfolios by altering their holdings close to the end of

the quarter, therefore misleading their fund investors. I use Agarwal et al. (2014)'s *rank gap* measure of window dressing, which captures the spread between the rank of the fund's actual performance and the composite ranks of winner/loser holdings. Agarwal et al. (2014) argue that portfolio window dressing has the potential to adversely affect fund value through unnecessary portfolio churning. Consistent with the proposition that ESG fund managers are less concerned that a poor quarter could lead to an outflow of investors, I find that they engage in less portfolio window dressing than conventional fund managers.

Motivated by the differences in disclosure behavior, I perform additional analyses to better understand what underlying factors and mechanisms drive my results. To test whether investor behavior is one of the forces driving managers' disclosure behavior, I examine investors' sensitivity to information on portfolio holdings. On average, investors of ESG funds are slightly less sensitive to the presence of *loser* stocks in the portfolio. These results corroborate the investors' clientele hypothesis – that is, ESG funds attract a distinct set of investors with longer investment horizons than those who invest in conventional mutual funds.

While prior studies support the hypothesis that investors of ESG funds and conventional funds differ in their inter-temporal preferences (Bollen, 2007, Renneboog et al., 2011), the assumption that capital market intermediaries (i.e., mutual funds) should be treated as a "veil" reflecting the preferences of investors is overly simplistic (He and Krishnamurthy, 2013). I then turn to investigate whether ESG fund managers' investment horizon differ from that of conventional managers. For this purpose, I use two proxies for fund trading frequency – turnover rate and holding duration. Studies show that, on average, funds that trade more frequently underperform (Chakrabarty et al., 2017, Champagne et al., 2018, Cremers and Pareek, 2016). Even though excessive trading

could harm fund performance, managers have incentives to adopt a short-term perspective. This occurs because chasing long-term mispricing could be more expensive and lead investors to misattribute inferior short-term stock returns to the manager's low ability (Shleifer and Vishny, 1990, 1997). Concern over the manager's trading ability could generate an outflow of investors and, consequently, increase the risk that the manager is terminated. I find that ESG fund managers indeed have longer investment horizons and trade less.

Given the well-documented differences in investors' clientele of ESG funds and traditional funds, a corporate governance mechanism that could plausibly explain the differences in window-dressing and trading frequency could be simply the endogenous choice of fund managers by investment management firms. In other words, investment management firms could screen fund managers based on different dimensions of their education and cultural background, placing more (or less) emphasis on some characteristics contingent on whether the job applicant would manage an ESG or conventional fund. To explore this possibility, I examine several characteristics, such as education, dominant style, professional busyness, gender, and tenure. I find only two distinct characteristics between ESG fund managers and conventional fund managers: ESG fund managers, on average, have more experience managing active funds than passive funds; and, on average, hold an additional position inside the investment management company (e.g., analyst, trader, broker liaison). Overall, these findings further support the interpretation that the difference in disclosure behavior of ESG fund managers is a manifestation of differences in investors' pressure and focus on short-term performance.

Taken together, my contributions speak to different strands of literature. First, my empirical results further our understanding of ESG investing. Whereas prior research focuses on the profitability of ESG funds, our understanding of the behavior of ESG in-

stitutional money managers is relatively limited. To the best of my knowledge, this study is the first to examine the relationship between the myopic behavior of fund managers and ESG investing.

I present several pieces of evidence consistent with the hypothesis that investors of ESG funds, through their long-term orientation, lessen capital market pressures that induce fund managers to constantly report superior short-term investment decisions. In addition, this paper also contributes to the literature analyzing the impact of managers' skills on their decisions. My study fails to find any evidence that differences in skill sets are the drivers of ESG fund managers' less myopic behavior. My results emphasize the role of additional incentives, besides financial compensation, on managers' myopic decisions.

Finally, this paper complements the extensive literature on mutual funds by identifying how a fund-specific characteristic (ESG) that pertains to a broad class of investment strategies and style relates to the investment behavior of fund managers.

The remainder of the paper proceeds as follows. Section 2 describes the related literature and the empirical predictions. Section 3 provides the data description and summary statistics, while Section 4 discusses the empirical results. Section 5 presents additional analysis, and Section 6 concludes.

1.1.1 Related Literature and Empirical Predictions

Following the increasing relevance of ESG and corporate social responsibility (CSR), there is a growing body of literature in accounting and finance on the real and reporting effects associated with CSR activities. For example, studies provide empirical evidence

that firms with high CSR activities have less opaque financial reports and are less likely to manage earnings (Dhaliwal et al., 2011, Kim et al., 2012). Moreover, CSR activities of firms are also related to less informed trading (Gao et al., 2014), and firms with high scores on material ESG issues tend to outperform those with low scores (Khan et al., 2016).

From the standpoint of institutional investors, various empirical studies emphasize the relationship between different investors' decisions and the ESG performance of their investee firms. For instance, when a mutual fund actively engages with an investee firm to address ESG concerns, the latter generates positive abnormal returns over the year following the engagement (Dimson et al., 2015). Recent studies show that after recognizing the financial value of ESG, institutional investors persuade investee firms to improve their ESG performance (Dyck et al., 2018) and that institutional investors with longer horizons tend to prefer higher ESG firms (Starks et al., 2017).

1.1.2 ESG funds versus conventional funds

Previous studies indicate that ESG investors differ from ordinary investors in many dimensions. For example, Bollen (2007) analyzes investor cash flows of mutual funds and finds that socially responsible mutual funds have lower volatility in their monthly fund flows. In addition, he establishes that capital flows to socially responsible funds are more sensitive to past positive returns and weakly less sensitive to negative past returns. Using an international setting, Renneboog et al. (2011) corroborate the findings of Bollen (2007) and document that the investors' flows of socially responsible funds are less sensitive to the average return of the previous 12 months. More recently, a study by Riedl and Smeets (2017) combining individual-level data from a Dutch mutual fund

provider with a survey and an experiment examines why investors hold socially responsible mutual funds. They conclude that intrinsic social preference and social signaling are major determinants of holding ESG equity funds. They also find financial motivations for investors' decisions, since they are less likely to invest in ESG funds if they expect these funds to underperform relative to conventional funds – albeit investors with strong social motivations are willing to forgo financial returns to align their investments with their social preferences.

However, it is not clear whether the behavior of fund investors is a sufficiently strong incentive for managers to pursue long-term investment strategies desired by their investors' clientele. First, seminal theories argue that managers' behavior might be influenced by career concerns (Fama, 1980, Holmström, 1999, Lazear and Rosen, 1981). Moreover, another body of literature documents different agency conflicts between fund managers and their investors. They emphasize that managers' investment decisions can be affected both by the explicit compensation schemes and by implicit incentives resulting from their aspiration to attract new investors (Chevalier and Ellison, 1997, 1999a,b, Khorana, 1996, Modigliani and Pogue, 1975). For instance, Brown et al. (1996) claim that the competitive nature of the mutual fund environment alone can affect managers' portfolio decisions. According to the authors, the mutual fund industry resembles a tournament in which managers compete for new investors. Their evidence highlights this behavior, as they establish that managers who are likely to end up as losers (winners) shift their investments so as to increase (decrease) the risk levels of their portfolios. Chevalier and Ellison (1999a) examine how the fear of getting fired can affect mutual fund managers' behavior. Their findings indicate that managers are punished for widely deviating from the unsystematic risk level in their corresponding objective group. Consequently, young managers, who have higher career concerns than senior managers, end up taking less unsystematic risk and have more conventional portfolios in order to avoid

getting penalized.

1.1.3 Fund manager short-termism

The voluminous literature on corporate myopia suggests that the excessive focus on short-term performance is positively associated with earnings management and less efficient real investment decisions (Bhojraj et al., 2009, Roychowdhury, 2006). In his seminal work, Roychowdhury (2006) shows evidence of managers manipulating real activities to avoid reporting losses. Bhojraj et al. (2009) find that firms are willing to cut discretionary expenses and manage accruals in order to exceed analyst forecasts and that firms that beat forecasts by managing earnings enjoy a short-term stock price benefit that is typically reversed over a three-year period.

The short-termism of fund managers can be harmful to both fund investors and investee companies. Bushee (1998), for example, concludes that institutional ownership, on average, works as an efficient corporate governance mechanism by mitigating the adverse incentives for corporate managers to reduce their R&D investments. However, his findings also indicate when considering the ownership by institutional investors with high portfolio turnover, the overall effect is reversed – i.e., a large proportion of short-termist institutional owners increases the likelihood of managers cutting R&D to reverse earnings declines. Agarwal et al. (2017) discover evidence of the direct effect of fund manager short-termism on corporate short-termism. Exploiting the increase in the frequency of mandatory disclosures of portfolio holdings by mutual fund managers, they find that more frequent disclosures are associated with the increasing myopia of fund managers, which leads to subsequent declines in the innovation activities of firms with high fund ownership.

A possible channel by which fund managers' short-termism can harm their corresponding investors is through portfolio window dressing, which is the strategy of adding winners and/or eliminating losers to the portfolio in order to mislead investors regarding their true ability (Agarwal et al., 2014, Lakonishok et al., 1991). To engage in window dressing, managers have to buy (sell) stocks that have recently outperformed (underperformed), hence, buying (selling) potentially overpriced (underpriced) securities. This unnecessary portfolio churning incurs high trading costs and is shown to be a value-destroying activity, eventually worsening future fund performance (Agarwal et al., 2014).

Motivated by prior literature, I posit that the long-term orientation of ESG investors decreases capital market pressures that induce fund managers to regularly report superior short-term investment decisions, consequently decreasing their incentives to engage in opportunistic disclosure behavior. This prediction can be formalized as the main hypothesis of the paper, stated in a directional form:

Hypothesis: *Managers of ESG mutual funds are less likely to engage in portfolio window dressing than managers of conventional (non-ESG) mutual funds.*

This hypothesis is not without tension. ESG mutual funds are subject to compensation structures strictly based on financial performance akin to those of conventional funds. That is, there are also reasons supported by the theoretical and empirical literature that would predict no differences in portfolio window dressing between ESG and conventional funds.

1.2 Data

A key empirical challenge when investigating differences between ESG and conventional mutual funds is the fact that fund-specific actions (namely, investment philosophies and trading strategies) are not directly observable. Whereas some mutual funds are explicitly self-proclaimed as ESG funds, there is no specific market or regulatory mechanism that prevents these funds from endogenously choosing to be ESG in name only – i.e., to attract new investors. One way to assess whether funds follow ESG policies is through a sustainability rating assessed by a plausibly independent third party provider. Since 2016, Morningstar gives mutual funds a rating based on how well the holdings in their portfolio are managing ESG risks and opportunities relative to their peers.

To calculate the ratings, Morningstar uses firm-level ESG scores provided by Sustainalytics[4], a research firm that provides ESG scores along with assessments of companies' involvement in ESG-related controversies for more than 4,500 firms globally, in addition to tracking and categorizing ESG-related controversial incidents for more than 10,000 firms. The portfolio score is an asset-weighted average of the ESG scores of the portfolio holdings, with deductions made for securities of firms involved in controversial incidents. Then, based on their portfolio sustainability scores, funds are assigned one of the following five descriptive ranks relative to their peers: *High* for the top 10% of the funds; *Above Average* for the next 22.5%; *Average* for the next 35%; *Bellow Average* for the next 22.5%; and *Low* for the bottom 10% of the funds. Morningstar does not provide historical data on its sustainability ratings. To minimize this issue, I collect information on the last four issued ratings and label funds "ESG" only when they have a *High* ratings in each of the four periods. Thereby, I aim to capture funds

[4]Morningstar claims to use Sustainalytics due to its reputation for transparent, insightful research, and great customer service.

that have consistently high ESG ratings through time[5]. I merge the lists of ESG funds to the CRSP Survivor-Bias-Free US Mutual Fund Database. CRSP Mutual Fund provides various fund-specific characteristics along with portfolio holdings information. I use CRSP Monthly Stock and Compustat to gather market and fundamental data on the funds' equity holdings. Funds that do not have the requisite information from all three databases in any given quarter are dropped from the sample. I restrict the analysis to actively managed U.S. equity mutual funds, excluding index, bond, and international funds from my sample[6]. Since CRSP's fund portfolio holdings data starts in 2001, I use a quarterly sample from 2001 to 2017 for the analysis, comprising a total of 68 quarters. Following early studies that claim that small mutual funds behave differently from other funds (Bhojraj et al., 2012, Chen et al., 2004, Elton et al., 2001), I restrict the sample to mutual funds with total net assets (TNA) exceeding $15 million. For funds with multiple share classes in CRSP, I compute the sum of TNA in each share class to arrive at the TNA in the fund. The final sample is comprised of 4,696 unique conventional mutual funds and 127 unique ESG mutual funds. To correct for the naturally unbalanced properties of the samples of ESG and conventional funds, in all the empirical tests I use entropy balancing with fund size, age, and strategy as parameters[7]. Table 1.1 provides the summary statistics for the key variables used in the study. In panel B, I report the means and standard deviations of the variables for ESG mutual funds and conventional mutual funds. In panel C, I report time-series averages of the cross-sectional correlations between various fund characteristics. Consistent with previous studies, $LogFamilySize$, $LogFundSize$, and *Load* are positively correlated with each other.

[5]I run the same tests presented in this paper using a continuous sustainability score and an indicator variable that takes a value of one if the fund is in the highest decile of the average sustainability score and obtain similar, although weaker, results.

[6]To do this, I select mutual funds whose CRSP Objective Code (crsp_obj_cd) is "ED," "EDCM," "EDCS," "EDSC," "EDSI," "EDSN," "EDST," "EDSU," "EDYB," "EDYG," "EDYH," or "EDYI."

[7]Entropy balancing is a re-weighting technique that represents a generalization of propensity score matching to achieve significantly improved covariate balance across treatment and control samples (Hainmueller, 2012).

Table 1.1 Descriptive Statistics and Correlation Coefficients

Panel A: Sample Selection

	# of ESG Funds		ESG Funds	Conventional Funds
US Equity Funds (actively managed)	244	Number of unique funds	127	4,696
Missing CRSP items	(74)	Number of unique families	78	770
Funds with TNA < $15 million	(43)	Average funds per quarter	39	1,331
Total	127			

Panel B: Descriptive Statistics

	Mean	SD	Min	Max
	ESG Funds			
Fund size ($ million)	856.06	1,135.51	15.60	4,617.60
Log fund size	6.21	1.80	2.83	8.97
Family size ($ million)	137,650.40	282,766.70	25.50	1,500,285.00
Log family size	9.78	2.52	3.24	14.22
Turnover	0.48	0.38	0.05	2.83
Holding duration (years)	1.88	0.93	0.17	3.89
Manager tenure (years)	8.32	5.21	0.42	20.25
Fund age	16.86	14.34	1.33	80.67
Expense ratio	0.012	0.003	0.006	0.024
% Fund flows	0.01	0.11	-0.32	0.91
Market-adj returns	0.004	0.028	-0.106	0.082
Beta-adj returns	-2.97	0.64	-6.40	-1.29
3 factor-adj returns	-3.23	1.52	-7.51	2.08
4 factor-adj returns	-2.97	1.68	-7.58	2.33
	Conventional Funds			
Fund size ($ million)	614.25	1415.06	15.70	9124.50
Log fund size	5.06	1.58	2.75	9.12
Family size ($ million)	161,417.20	337,064.40	25.50	1,874,617.00
Log family size	10.06	2.54	3.24	14.44
Turnover	0.83	0.78	0.03	4.82
Holding duration (years)	1.50	0.90	0.00	4.69
Manager tenure (years)	8.22	5.13	0.42	24.58
Fund age	14.94	13.55	0.50	93.42
Expense ratio	0.012	0.004	0.001	0.025
% Fund flows	0.01	0.17	-0.32	1.04
Market-adj returns	-0.002	0.036	-0.338	0.412
Beta-adj returns	-3.05	0.95	-12.32	3.88
3 factor-adj returns	-3.44	1.98	-26.48	6.73
4 factor-adj returns	-3.32	2.21	-24.65	20.43

Panel C: Time-series averages of correlations between fund characteristics

	Turnover	Fund size	Log fund size	Fund flows	Log family size	Expense ratio	Fund age	Load
				ESG Funds				
Turnover	1							
Fund size	-0.20	1						
Log fund size	-0.13	0.73	1					
Fund flows	-0.04	-0.18	-0.15	1				
Log family size	0.14	0.30	0.63	-0.11	1			
Expense ratio	0.17	-0.38	-0.42	0.09	-0.17	1		
Fund age	0.00	0.54	0.49	-0.24	0.32	-0.34	1	
Load	-0.12	0.17	0.22	-0.18	0.26	-0.01	0.33	1
				Conventional Funds				
Turnover	1							
Fund size	-0.17	1						
Log fund size	-0.19	0.72	1					
Fund flows	0.04	-0.24	-0.20	1				
Log family size	-0.06	0.27	0.37	-0.10	1			
Expense ratio	0.18	-0.32	-0.42	0.07	-0.21	1		
Fund age	-0.11	0.40	0.46	-0.19	0.18	-0.26	1	
Load	-0.04	0.08	0.10	-0.07	0.15	0.05	0.32	1

This table presents descriptive statistics of the main variables used for estimating Equations (1.3) and (1.4). For variable descriptions, see the appendix A.

1.2.1 Measurement of Window Dressing

I follow Agarwal et al. (2014) to construct the window dressing measures. Their rationale is that, on average, poorly performing funds should have a greater percentage of loser stocks and a smaller percentage of winner stocks in their portfolio when compared to well-performing funds. Conversely, poorly performing funds with a high percentage of winners and a low percentage of losers suggests a higher likelihood of window dressing behavior. I use the Agarwal et al. (2014) measure of window dressing called *Rank Gap*, which is a relative measure that captures the discrepancy between a performance-based ranking of a fund and a ranking based on the proportions of winner and loser stocks disclosed by the fund at quarter-end. The intuition is to capture situations where the overall performance of the fund is inconsistent with the corresponding performance of its portfolio holdings.

For each fiscal quarter t, I create quintiles of all domestic stocks in the CRSP stock database by sorting stocks according to their returns over the past three months. The first (fifth) quintile consists of stocks that achieve the highest (lowest) returns. Next, using funds' reported holdings, I calculate the proportion of each fund's assets invested in the first and fifth quintiles, referring to these two extreme quintiles as *winner* and *loser* proportions, respectively. I then rank the funds between 1 and 100 in three ways: (1) for the performance rank I sort funds in *descending* order by their quarterly returns; (2) for the winner rank I sort funds in *descending* order according to their proportion of winner stock holdings; (3) for the loser rank I sort funds in *ascending* order according to their proportion of loser stock holdings. That way, a well-performing fund should have high ranks (i.e., closer to the 1st percentile) and a poorly performing fund should have low ranks (i.e., closer to the 100th percentile) in all three ranks. However, a fund with a low-performance rank but relatively high rankings of winner and loser proportions

should have a greater likelihood of window dressing. The Rank Gap is computed as follows:

$$RankGap = \frac{PerformanceRank - \frac{WinnerRank + LoserRank}{2}}{200} \tag{1.1}$$

The measure is scaled by 200 to lie between –0.5 and 0.5. The higher the *Rank Gap* is, the larger the discrepancy between the fund's actual performance and the fund's disclosure of winners and losers stocks – therefore, the greater the likelihood of window dressing. For the empirical analysis, I use *Rank Gap* in its continuous form and also as an indicator variable based on the top 10% and 20% values of this *Rank Gap* continuous measure. Figure 1.2 plots the histogram of the frequency distribution of the *Rank Gap* score for conventional funds (Panel A) and ESG funds (Panel B).

1.3 Empirical Results

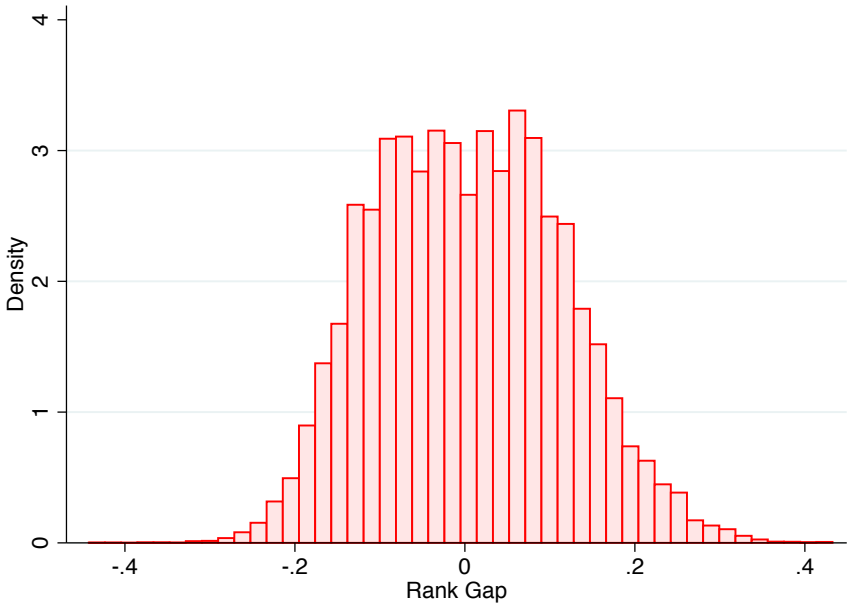
In order to empirically test my main hypothesis that ESG fund managers differ from their conventional counterparts in their opportunistic disclosure behavior, I estimate the following reduced-form specification:

$$WD_{i,t} = \alpha_i + \gamma_t + \beta_1 ESGfund_i + \sum \beta_i Z_{i,t} + \epsilon_{i,t}, \tag{1.2}$$

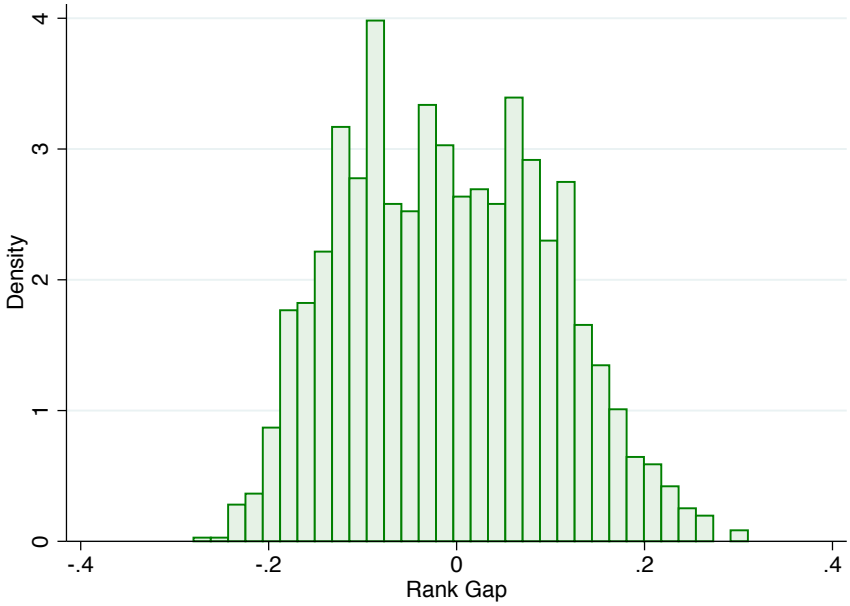
where i indexes different mutual funds and t quarters. The variable $WD_{i,t}$ denotes the different proxies for window dressing – i.e., *Rank Gap*, as the continuous variable defined in Section 3.1 and indicator variables based on the top 10% and 20% of the distribution of *Rank Gap* estimated using probit specifications. α_i denotes fund strategy fixed effects

.

Figure 1.2 Histograms of Rank Gap Score for Conventional and ESG funds



Panel A: Conventional Funds



Panel B: ESG Funds

and γ_t time fixed effects. $ESGfund_i$ is an indicator variable that equals one if the fund has high ESG ratings according to Morningstar. The vector $Z_{i,t}$ denotes a set of control variables with previously documented effects on funds' performance and disclosure behavior, such as load, fund flows, fund size, family size, expense ratio, fund age, and fund return.[8] In all empirical specifications throughout this paper, I cluster standard errors at the fund level to account for correlation between repeated observations associated with the same mutual fund (Petersen, 2009).

Table 1.2 depicts the OLS and probit estimates for all three measures of window dressing. My main coefficient of interest is β_1, whose estimates are all negative and statistically significant (p-values<0.01). These results, while far from conclusive, are consistent with previous studies that show that investors of ESG funds are less sensitive to negative financial performance, therefore reducing managers' incentives to engage in opportunistic disclosure behavior. In other words, they have less incentive to mislead investors when they have a poor quarter performance.

1.4 Additional Analysis

Motivated by the differences in disclosure behavior documented in Table 1.2, I perform additional analyses to better understand what underlying factors and mechanisms are driving my results.

[8]The variables are described in detail in Appendix A.

Table 1.2 ESG Funds and Window Dressing

	Rank Gap		Rank Gap 10%		Rank Gap 20%	
	(1)	(2)	(3)	(4)	(5)	(6)
$ESGfund_i$	-0.012***	-0.012***	-0.165***	-0.171***	-0.132***	-0.141***
	(-4.13)	(-4.19)	(-2.80)	(-2.79)	(-2.91)	(-3.06)
$Load_{i,t}$		0.007*		0.083		0.081
		(1.96)		(1.16)		(1.50)
$FundFlows_{i,t}$		-0.000		-0.000		-0.000
		(-0.80)		(-1.26)		(-0.93)
$FundSize_{i,t}$		-0.001		-0.051**		-0.019
		(-1.13)		(-2.34)		(-1.04)
$FamilySize_{i,t}$		0.001		-0.005		-0.008
		(1.08)		(-0.50)		(-0.89)
$ExpenseRatio_{i,t}$		0.706		4.139		10.004
		(1.08)		(0.37)		(1.26)
$FundAge_{i,t}$		-0.000		-0.007***		-0.005***
		(-1.22)		(-2.65)		(-2.88)
$FundReturn_{i,t}$		0.002**		0.023*		0.014
		(2.05)		(1.66)		(1.26)
Quarter FE	yes	yes	yes	yes	yes	yes
Strategy FE	yes	yes	yes	yes	yes	yes
R^2	0.06	0.06	0.10	0.11	0.05	0.06
N	46,806	46,806	46,806	46,806	46,806	46,806

This table presents ordinary least-squares estimates of Equation (1.2) in column (1) and (2) and probit estimates in columns (3) to (6) relating window dressing to social responsibility. *Rank Gap* is a measure of window dressing developed by Agarwal et al. (2014). *Rank Gap 10%(20%)* is an indicator variable defined as 1 if *Rank Gap* is in the top 10th (20th) percentile for a given quarter, and zero otherwise . *ESG funds* is an indicator variable that equals one if the fund have high ESG ratings. For other variable descriptions, see appendix A. Standard errors are clustered at the fund level. *t*-statistics are reported in parentheses. Statistical significant at the 10%, 5%, and 1% level is denoted by *, **, and ***, respectively.

1.4.1 Fund Flow

Theoretical and empirical studies indicate that investors of socially responsible funds should be less sensitive to past negative results, not only because they are willing to pay a premium to indirectly hold socially responsible investments but also due to their long-term investment perspective (Bollen, 2007, Gollier and Pouget, 2014, Heinkel et al., 2001, Renneboog et al., 2011). To empirically test whether the behavior of investors is what drives managers' willingness to engage in opportunistic behavior, I examine investors' flow sensitivity to the presence of loser and winner stocks in the funds' portfolio. I estimate the relationship between funds' social responsibility classification and

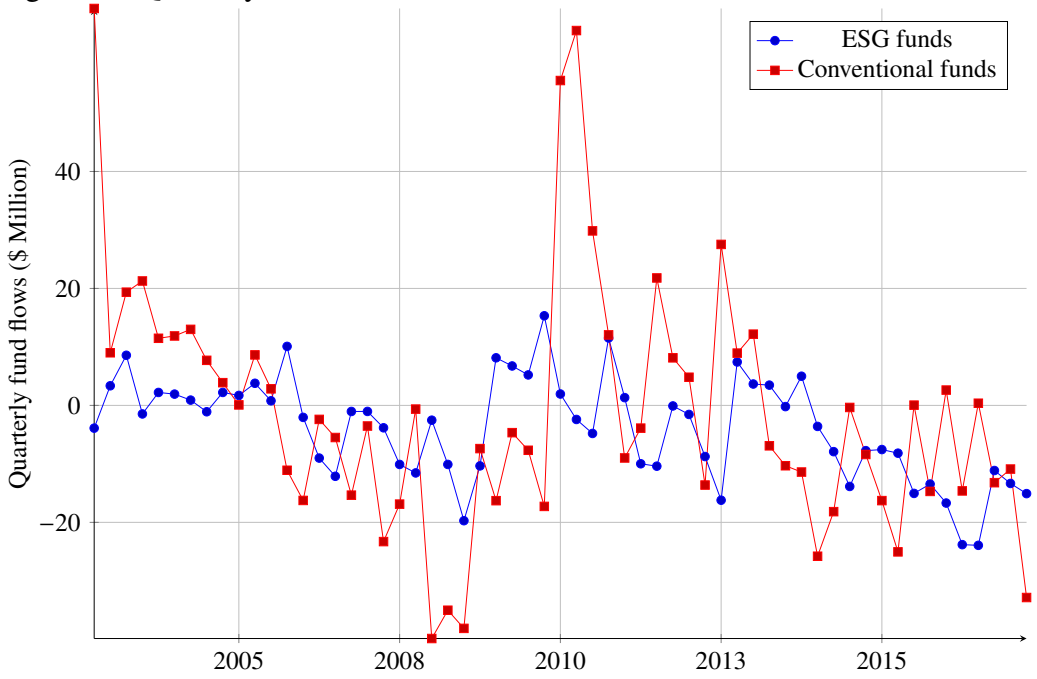
fund flows with the following specification:

$$Flow_{i,t+1} = \alpha_i + \gamma_t + \beta_1 \%Losers_{i,t} + \beta_2 \%Winners_{i,t} + \sum \beta_i Z_{i,t} + \epsilon_{i,t} \tag{1.3}$$

where $Flow$ is the quarterly capital flows for a fund, measured as the percentage change in a fund's assets after adjusting for fund returns; α_i denotes fund strategy fixed effects; and γ_i time fixed effects. $\%Losers_{i,t}$ ($\%Winners_{i,t}$) is the percentage of assets of a fund invested in stocks that had an inferior (superior) performance in quarter t. I follow Lakonishok et al. (1991)'s and Agarwal et al. (2017)'s approach to build the $\%Losers_{i,t}$ ($\%Winners_{i,t}$) variables. Losing (winning) stocks are those that fall in the bottom (top) quintile of return performance within the group of firms with a similar size and book-to-market ratios during the reporting period t. I first separate stocks into quintiles based on size. Then, within each size quintile, I create book-to-market quintiles, resulting in 25 conditional portfolio sorts. Losing (winning) stocks are the ones in the bottom (top) 20% based on return performance in each of the 25 groups. In addition, I use quintiles of the $\%Losers_{i,t}$ ($\%Winners_{i,t}$) variables. $High\%Loser_{i,t}s$ ($High\%Winners_{i,t}$) is an indicator variable that takes the value of one if the fund is in the highest quintile. To test the fund flows sensitivity to fund performance, I utilize $ReturnBottom_{i,t}$ ($ReturnTop_{i,t}$) that equals one if the fund is on the bottom (top) quintile of returns. Similar to my main results of portfolio window dressing, vector $Z_{i,t}$ denotes the set of control variables which plausibly affect fund performance and, in turn, capital flows of fund investors.

Figure 1.3 plots the average capital flows of ESG funds and conventional funds. Table 1.3 presents the coefficient estimates of Equation (1.3). Columns (1) and (4) report the estimates using the continuous variables $\%Losers_{i,t}$ ($\%Winners_{i,t}$); columns (2) and

Figure 1.3 Quarterly Fund Flows



This figure presents the average fund flows, defined as the percentage change in the assets under management of a fund after adjusting for fund returns during the quarter.

(5) use the indicator variables $High\%Losers_{i,t}$ ($High\%Winners_{i,t}$); and columns (3) and (6) report the indicator variables $ReturnBottom_{i,t}$ ($ReturnTop_{i,t}$). First, by considering a sample comprised of conventional funds only, we can conclude that the coefficients on $\%Losers_{i,t}$ and $High\%Losers$ are negative and statistically significant (p-value<0.01), suggesting that investors of conventional funds respond negatively to the presence of losing stocks in the fund portfolio. However, when restricting the sample to ESG funds only, I find that the coefficients of $\%Losers_{i,t}$ and $High\%Losers$ are not significant, failing to provide evidence that investors of ESG Funds are as sensitive to the presence of losing stocks as their conventional peers. A similar pattern is observed regarding the coefficient estimates of $\%Winners_{i,t}$ and $High\%Winners$. Investors of conventional funds respond positively to the presence of winning stocks, whereas ESG funds' investors show no sensitivity. The aforementioned results corroborate previous studies that argue that investors of ESG funds have long-term investment horizons, therefore they are less

Table 1.3 Fund Flow Sensitivity to Winners and Losers

	$ESGfund_i$			$ConventionalFund_i$		
	(1)	(2)	(3)	(4)	(5)	(6)
$\%Losers_{i,t}$	-0.046			-0.533***		
	(-0.19)			(-5.93)		
$\%Winners_{i,t}$	0.468*			0.295***		
	(1.85)			(4.40)		
$High\%Losers_{i,t}$		-4.930			-10.688***	
		(-0.57)			(-4.96)	
$High\%Winners_{i,t}$		6.887			7.252***	
		(0.65)			(3.24)	
$ReturnBottom_{i,t}$			-5.921			-8.905**
			(-0.43)			(-1.97)
$ReturnTop_{i,t}$			13.995			0.422
			(0.96)			(0.12)
$Load_{i,t}$	-20.916*	-19.946*	-20.408*	-10.726***	-10.700***	-10.704***
	(-1.93)	(-1.84)	(-1.94)	(-2.84)	(-2.83)	(-2.82)
$FundSize_{i,t}$	-0.007	-0.007	-0.007	-0.004**	-0.004**	-0.004**
	(-0.88)	(-0.87)	(-0.89)	(-2.25)	(-2.23)	(-2.21)
$FamilySize_{i,t}$	-2.563	-2.297	-2.514	0.117	0.108	0.035
	(-1.13)	(-1.03)	(-1.19)	(0.20)	(0.19)	(0.06)
Fund age	-1,118.002	-974.476	-922.836	375.917	366.378	361.998
	(-0.70)	(-0.62)	(-0.61)	(0.95)	(0.93)	(0.92)
$ExpenseRatio_{i,t}$	-0.692	-0.602	-0.580	-0.567***	-0.575***	-0.585***
	(-1.16)	(-1.03)	(-1.00)	(-3.63)	(-3.68)	(-3.76)
$FundAge_{i,t}$	-0.965	-0.264	0.023	-5.540***	-5.403**	-5.278**
	(-0.16)	(-0.05)	(0.00)	(-2.65)	(-2.57)	(-2.49)
$FundReturn_{i,t}$	2.216	2.046	2.183	-1.121*	-1.287**	-1.419**
	(1.52)	(1.42)	(1.52)	(-1.87)	(-2.13)	(-2.35)
Quarter FE	yes	yes	yes	yes	yes	yes
Strategy FE	yes	yes	yes	yes	yes	yes
R^2	0.14	0.14	0.14	0.05	0.05	0.05
N	1,849	1,849	1,849	26,943	26,943	26,943

This table reports the results of regressions using quarterly percentage net fund flows during the lead quarter as the dependent variable. $FundFlows_{i,t}$ is the percentage change in the assets under management of a fund after adjusting for fund returns during the quarter. *%Losers* (*%Winners*) is the percentage of assets of a mutual fund invested at the end of quarter t in losing (winning) stocks as defined in section (5.1). For other variable descriptions, see appendix A. Standard errors are clustered at the fund level. t-statistics are reported in parentheses. Statistical significant at the 10%, 5%, and 1% level is denoted by *, **, and ***, respectively.

sensitive to investment holdings labeled as "winners" or "losers" purely based on past financial performance.

1.4.2 Investment Horizon

As previously discussed, although studies show that investors of ESG funds have longer investment horizons (Bollen, 2007, Renneboog et al., 2011), the assumption that cap-

ital market intermediaries' actions fully reflect the preferences of their client-investors is overly simplistic (He and Krishnamurthy, 2013). Therefore, I turn to investigating whether ESG fund managers' investment horizons differ from those of conventional managers. I use two measures of manager's investment horizon, *Fund Turnover* and *Holding Duration*. A fund turnover rate is the percentage of the fund's holdings that have been replaced in a given period, and holding duration is the average length of time securities are normally held in the portfolio. The turnover rate inherently captures the inverse of holding duration – i.e., the shorter the investment horizon, the higher the turnover. I obtain the quarterly turnover measure from the CRSP Mutual Fund database, which accounts for the minimum of the total purchases and sales by a fund in a quarter divided by the beginning-of-the-quarter assets under management. For holding duration, I use Cremers and Pareek (2016) measure, which is the average of the duration of ownership of each stock held by fund i in quarter t. The duration for each stock j is computed as follows:

$$Duration_{i,j,t-1} = \sum_{\tau=t-W}^{t-1} \left(\frac{(t-\tau-1)\alpha_{i,j,\tau}}{H_{j,t-1} + B_{i,j,t-1}} \right) + \frac{(W-1)H_{i,j,t-1}}{H_{i,j,t-1} + B_{i,j,t-1}}, \tag{1.4}$$

where $B_{i,j,t-1}$ is the total percentage of shares of stock j bought by fund i between $\tau = t - W$ and $t - 1$. $H_{i,j,t-1}$ is the percentage of total shares outstanding of stock j held by fund i at time $t - 1$. $\alpha_{i,j,t}$ is the percentage of total shares outstanding of stock j bought or sold by fund i between $t - 1$ and t, where $\alpha_{i,j,t} > 0$ for buys and $\alpha_{i,j,t} < 0$ for sells. Following Cremers and Pareek (2016), I set $W = 20$ quarters.

To estimate the relationship between funds' ESG engagement and their managers' investment horizon, I use the following equation:

$$log(Horizon)_{i,t} = \alpha_i + \gamma_t + \beta_1 ESGfund_i + \sum \beta_i Z_{i,t} + \epsilon_{i,t}, \tag{1.5}$$

where the variable $Horizon_{i,t}$ denotes either the fund turnover measure provided by the CRSP Mutual Fund database or duration, as defined in equation (1.4). The coefficient of interest is β_1 – i.e., the estimate of the association between a fund pursuing ESG strategies and the longevity of its stock holding period. The vector $Z_{i,t}$ denotes the same set of fund-level covariates that are known to affect investment horizon.

Table 1.4 reports the estimates of equation (1.5). The estimated coefficient for ESG funds, β_1, is statistically significant for both Turnover (negative) and Duration (positive), demonstrating that managers of ESG funds do indeed use long-term performance metrics for their investment decisions.

Table 1.4 Fund Manager Investment Horizon

	$ln(Turnover)_{i,t}$			$ln(Duration)_{i,t}$		
	(1)	(2)	(3)	(4)	(5)	(6)
$ESGfund_i$	-0.433***	-0.361***	-0.365***	0.239***	0.184***	0.193***
	(-5.23)	(-4.69)	(-4.88)	(3.28)	(2.69)	(3.06)
$Load_{i,t}$		-0.074	-0.070		0.047	-0.007
		(-0.87)	(-0.84)		(0.69)	(-0.10)
$FundFlows_{i,t}$		-0.000	-0.000		-0.000	-0.000
		(-0.34)	(-0.57)		(-0.96)	(-1.11)
$FundSize_{i,t}$		-0.096***	-0.099***		0.076***	0.078***
		(-3.14)	(-3.51)		(3.37)	(3.68)
$FamilySize_{i,t}$		0.060***	0.049***		-0.035**	-0.033**
		(3.03)	(2.59)		(-2.27)	(-2.34)
$ExpenseRatio_{i,t}$		20.785**	13.166		-16.953**	-12.388*
		(1.99)	(1.48)		(-2.21)	(-1.69)
$FundAge_{i,t}$		0.001	0.003		0.003*	0.003
		(0.38)	(1.25)		(1.80)	(1.60)
$FundReturn_{i,t}$		-0.017	-0.031**		0.041***	0.039**
		(-1.22)	(-2.22)		(2.76)	(2.53)
Time FE	yes	yes	yes	yes	yes	yes
Strategy FE	no	no	yes	no	no	yes
R^2	0.09	0.14	0.18	0.16	0.24	0.29
N	46,583	46,583	46,583	7,986	7,986	7,986

This table presents ordinary least-squares estimates of Equation (1.3) relating investment horizon to social responsibility. *Ln(Turnover)* is the natural log of the turnover ratio as provided by the CRSP Mutual Fund Database, defined as the minimum of the total purchases and sales by a fund in a quarter divided by the beginning-of-the-quarter assets. *Ln(Duration)* is a measure of investor duration developed by Cremers and Pareek (2016). *ESG funds* is an indicator variable that equals one if the fund have high ESG ratings. For other variable descriptions, see appendix A. Standard errors are clustered at the fund level. *t*-statistics are reported in parentheses. Statistical significant at the 10%, 5%, and 1% level is denoted by *, **, and ***, respectively.

1.4.3 Managers' Characteristics

Taken together, my results highlighting differences in window dressing and fund flows of ESG funds (vis-à-vis conventional funds) are empirically consistent with the hypothesis that managers of ESG funds translate the preferences of their ESG investors to their portfolio and disclosure decisions. However, such results still leave questions to be answered, such as the specific mechanisms through which investors' preferences are implemented. For example, one possible (governance) mechanism is that investment management companies, in knowing the objectives of their investors' clientele, simply screen fund managers based on different dimensions of their education and cultural background, placing more (or less) emphasis on some characteristics contingent on whether the job applicant would manage an ESG or conventional fund.

To investigate this possible channel, I examine several fund managers characteristics by using information provided by IPREO's BD Advanced, a proprietary database that contains data of over 40,000 fund managers, analysts, and senior corporate managers. I collect information about managers' education, investment approach, tenure, professional busyness, and gender. I then use fuzzy matching using managers' names to find correspondences between the sample extracted from CRSP and the sample obtained from IPREO's BD Advanced. The final sample is comprised of 479 unique mutual fund managers, of which 19 manage at least one ESG fund. To correct for the naturally unbalanced properties of the samples of ESG fund managers and conventional fund managers, in all the empirical tests I use entropy matching, with fund family size and fund age as balancing parameters. I run manager-level regressions defined as follows:

$$\begin{aligned} ESGmanager_{m,t} &= \alpha_m + \beta_1 Female_m + \beta_2 Grad_{m,t} + \beta_3 ActiveInvestor_m \\ &+\beta_4 Tenure_{m,t} + \beta_5 GrowthInvestor_m + \beta_6 Busyness_m + \epsilon_{m,t} + \sum \beta_i Z_{i,t}, \end{aligned} \tag{1.6}$$

where $ESGmanager_{m,t}$ is an indicator variable that equals one if the professional manages the portfolio of at least one ESG mutual fund and zero otherwise. $Female_m$ is an indicator variable that equals one if the mutual fund manager is female. $Grad_{m,t}$ is an indicator variable that equals one if the fund managers have a graduate degree (e.g., MBA or Ph.D.). $ActiveInvestor_m$ takes the value of one if most of the funds that the manager m manages currently or in the past are actively managed. $Tenure_{m,t}$ is the number of months scaled by 12 since the manager has been at the helm of the mutual fund. $GrowthInvestor_m$ is an indicator variable that equals one if the fund manager's dominant investment style is "growth" or "aggressive growth." $Busyness_m$ takes the value of one if the fund manager holds one or more concurrent job positions inside the investment management company (e.g., analyst, trader, broker liaison). The vector $Z_{m,t}$ denotes a set of fund characteristics variables average at fund manager level, such as the average size of the funds, family size, the average expense ratio, the average age of the funds, and the average return of the funds managed by manager m.

Table 1.5 presents the results of relating the ESG nature of the fund and the fund manager specific characteristics. I run probit models to capture the probability of managers being assigned to manage ESG funds conditional on their specific characteristics, clustering standard errors at the manager level to allow for correlation between repeated observations from the same individual. The estimated coefficient for active investor, $ActiveInvestor_m$, is positive and statistically significant, showing that managers of ESG funds are more likely to manage active funds. Since ESG fund managers have more experience managing active funds than passive funds, we would expect that ESG fund managers would trade more frequently in order to yield alpha to their investors, which runs contrary to the results of this study. The coefficient for professional busyness, $Busyness_m$, is also positive and significant, indicating that ESG fund managers are slightly more likely to have multiple functions inside the investment management firm.

Table 1.5 Fund Managers Characteristics

Dependent variable: $ESGmanager_m$	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$Female_m$	-0.669						-0.476	-0.325
	(-1.11)						(-0.72)	(-0.50)
$Grad_m$		-0.356					-0.464	-0.526*
		(-1.08)					(-1.50)	(-1.76)
$ActiveInvestor_m$			1.210***				1.257***	1.301***
			(2.92)				(3.02)	(3.13)
$Tenure_{m,t}$				0.016			-0.013	-0.008
				(0.63)			(-0.58)	(-0.35)
$GrowthInvestor_m$					-0.284		-0.307	-0.309
					(-0.93)		(-1.00)	(-1.09)
$Busyness_m$						0.582*	0.587*	0.683**
						(1.85)	(1.85)	(2.55)
$FundReturn_{i,t}$	0.038	0.046	0.050	0.043	0.040	0.043		0.050*
	(1.15)	(1.44)	(1.52)	(1.27)	(1.15)	(1.39)		(1.73)
$ExpenseRatio_{i,t}$	-14.072	-17.350	-33.883	-20.036	-19.214	-9.466		-23.783
	(-0.43)	(-0.51)	(-1.00)	(-0.62)	(-0.57)	(-0.29)		(-0.77)
$FundAge_{i,t}$	-0.002	0.001	-0.002	-0.002	-0.004	0.000		0.001
	(-0.12)	(0.04)	(-0.14)	(-0.16)	(-0.32)	(0.02)		(0.09)
$FundSize_{i,t}$	-0.016	-0.002	-0.016	-0.022	-0.011	0.015		0.012
	(-0.14)	(-0.02)	(-0.15)	(-0.22)	(-0.10)	(0.15)		(0.12)
$FamilySize_{i,t}$	0.002	-0.011	-0.032	0.006	0.013	0.031		0.021
	(0.04)	(-0.19)	(-0.49)	(0.12)	(0.23)	(0.56)		(0.39)
Quarter FE	yes	yes	yes	yes	yes	yes	yes	yes
Pseudo-R^2	0.05	0.05	0.07	0.04	0.05	0.07	0.12	0.14
N	6,973	6,973	6,973	6,914	6,973	6,973	6,974	6,914

This table presents probit estimates of Equation (1.6) relating managing an ESG fund to fund manager characteristics. $ESGmanager_{m,t}$ is an indicator variable that equals one if the professional manages the portfolio of at least one ESG mutual fund and zero otherwise. For other variable descriptions, see appendix A. Standard errors are clustered at the manager level. *t*-statistics are reported in parentheses. Statistical significant at the 10%, 5%, and 1% level is denoted by *, **, and ***, respectively.

I fail to find evidence of any other statistically significant difference between fund managers characteristics that could affect their assignment to ESG funds, such as investment style and tenure.

1.5 Conclusion

This paper provides empirical evidence consistent with the hypothesis that the long-term orientation of ESG fund investors changes the reporting incentives of ESG fund managers, leading to less reporting short-termism, reflected by less window dressing.

By using the ESG ratings of mutual funds provided by a third party entity, I show that ESG fund managers engage in less portfolio window dressing than conventional fund managers. I conduct a battery of tests to bolster the hypothesis that the preferences

of ESG fund investors for long-term investment objectives are translated to the actions of ESG fund managers. Specifically, I demonstrate that ESG fund managers have a longer investment horizon (less turnover and longer holding duration) than conventional managers, and investor flows of ESG funds are less sensitive to the presence of winners and losers stocks in the funds' portfolios vis-à-vis conventional fund flows. Attempting to shed light on a potential governance-related mechanism that ESG fund managers are screening to manage these vehicles for different characteristics than their counterparts, I fail to find evidence that individual managers' characteristics are systematically different for the two groups.

Overall, this paper contributes to the fast-growing literature on ESG investments by demonstrating that, in addition to potential differences in financial returns, such investment vehicles differ from their conventional counterparts in their opportunistic reporting decisions, an effect previously undocumented.

APPENDIX A

VARIABLE DESCRIPTIONS

Name	Description
A. Fund-level measures	
$ESGfund_i$	Funds that have rating High on the last four issued Morningstar Sustainability Rating.
$RankGap_{i,t}$	Spread between the rank of the fund's actual performance and the composite ranks of winner/loser holdings, computed as follows: $RankGap = \frac{PerformanceRank - \frac{WinnerRank + LoserRank}{2}}{200}$
$Turnover_{i,t}$	Minimum of the total purchases and sales by a fund in a quarter divided by the beginning-of-the-quarter assets, as provided by the CRSP Mutual Fund Database.
$Duration_{i,t}$	Fund duration is computed by averaging the duration of stock i in fund j in quarter t , using the market value of the stock holdings in each fund?s portfolio as weights. The duration for each stock i in fund j is computed as: $Duration_{i,j,t-1} = \sum_{\tau=t-W}^{t-1} \left(\frac{(t-\tau-1)\alpha_{i,j,\tau}}{H_{j,t-1} + B_{i,j,t-1}} \right) + \frac{(W-1)H_{i,j,t-1}}{H_{i,j,t-1} + B_{i,j,t-1}}$, where $B_{i,j,t-1}$ is the total percentage of shares of stock j bought by fund i between $\tau = t - W$ and $t - 1$. $H_{i,j,t-1}$ is the percentage of total shares outstanding of stock j held by fund i at time $t - 1$. $\alpha_{i,j,t}$ is the percentage of total shares outstanding of stock j bought or sold by fund i between $t - 1$ and t, where $\alpha_{i,j,t} > 0$ for buys and $\alpha_{i,j,t} < 0$ for sells. Following Cremers and Pareek (2016), I set $W = 20$ quarters.
$\%Losers_{i,t}(\%Winners_{i,t})$	Percentage of assets of a mutual fund invested in losing (winning) stocks, that is, stocks that fall in the bottom (top) quintile of return performance within the group of firms with similar size and book-to-market ratios during the reporting period t. We first divide stocks into quintiles based on size, and then further each size quintile into five groups based on book-to-market ratio. We then identify losing (winning) stocks as the bottom (top) 20% based on return performance in each size and book-to-market group.
$ReturnBottom_{i,t}(ReturnTop_{i,t})$	Indicator variable that equals one if fund i is on the bottom (top) quintile of returns in quarter t.
$FundSize_{i,t}$	Total net assets (TNA) under management in millions of dollars.
$Load_{i,t}$	Indicator variable defined as 1 if fund has any front-end or back-end load, and 0 otherwise.
$ExpenseRatio_{i,t}$	Fund's annual expense ratio reported at fund?s fiscal year end, as provided by the CRSP Mutual Fund Database.
$FundFlows_{i,t}$	Percentage change in the assets under management of a fund after adjusting for fund returns during the quarter.
$FundAge_{i,t}$	Number of months divided by 12 since the establishment of the fund.
$FamilySize_{i,t}$	Sum of total net assets under management of the funds in the fund family that the fund belongs to.
$FundReturn_{i,t}$	Fund return adjusted using the four-factor model in Carhart (1997).
B. Fund manager characteristics	
$ESGmanager_m$	Indicator variable that equals one if the professional manages the portfolio of at least one ESG mutual fund and zero otherwise.
$Female_m$	Indicator variable that equals one if the given name of the mutual fund manager m is a female name. Fund managers with unisex given names were manually checked to determine the gender.
$Grad_m$	Indicator variable that equals one if the mutual fund manager holds any kind of graduate degree, such as MBA, MPS, JD, or Ph.D.
$ActiveInvestor_m$	Indicator variable that equals one if most of the funds that the manager m manages currently or in the past are actively managed, as provided by IPREO's BD Advanced Database.
$Tenure_{m,t}$	Number of months scaled by 12 since the manager has been at the helm of the mutual fund.
$GrowthInvestor_m$	Indicator variable that equals one if the fund manager dominant investment style is "growth" or "aggressive growth", as provided by IPREO's BD Advanced Database.
$Busyness_m$	Indicator variable that equals one if the fund manager holds one or more concurrent job positions inside the investment management company, as provided by IPREO's BD Advanced Database.

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