What drives corporate ESG? Disentangling the importance of investors, managers, and firms

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Abstract

We study the relative importance of investor, manager, and firm heterogeneities on firms' Environmental, Social, and Governance (ESG) policies. We find that investor fixed effects explain most of the variation in ESG policies. The improvement in the model fit from adding investor effects is particularly strong for the environmental dimension. Additional analyses show stronger empirical support for an underlying channel based on investor influence over ESG policies rather than investor selection of high ESG firms. We document significant associations between investor effects and both subsequent voting decisions on ESG proposals and the likelihood that firms are involved in ESG misconducts.

Keywords: ESG, CSR, Investor fixed effects, Manager fixed effects, Institutional investors

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1 Introduction

Environmental, Social, and Governance (ESG) considerations are prime concerns for many firms, especially with growing interest in issues such as climate change, employee rights, and social inequality. The literature documents that firms' ESG-related choices are greatly influenced by a variety of manager characteristics: managers' materialistic nature (Davidson et al., 2019); political affiliations (Di Giuli and Kostovetsky, 2014); and demographic characteristics such as age, sex, and marital status (Borghesi et al., 2014; Hegde and Mishra, 2019). Meanwhile, investor influence on firms' ESG policies has recently been established by several authors (e.g., Dyck et al., 2019; Gloßner, 2019). Despite the influence of managers and investors on ESG policies having been extensively studied, until now these roles have only been analyzed separately. Thus, little is known about the *relative* importance of managers and investors for firms' ESG-related choices. Moreover, if manager and investor beliefs, skills, and preferences are not independent, an analysis that considers them separately could produce biased results.[1]

Our work considers manager and investor characteristics together in a single framework in order to address an important gap in the literature. We jointly study the role of firm, manager, and investor heterogeneities in firms' ESG policies. In our approach, grounded in a well-established strand of literature (see e.g., Bertrand and Schoar, 2003; Cronqvist and Fahlenbrach, 2008; Graham et al., 2012), we regress firms' ESG outcomes on year, firm, manager, and institutional investor fixed effects. Our main objective, therefore, is to isolate the effects of firm, manager, and investor

[1] As an example of this issue, consider the evidence that investors might disproportionately allocate assets to firms whose executives share the same political affiliation (e.g., Wintoki and Xi, 2020). At the same time, political affiliation shapes both investors' preferences toward high ESG firms and firms' ESG policies (Hong and Kostovetsky, 2012; Di Giuli and Kostovetsky, 2014).

heterogeneities on firms' ESG performance and understand their relative importance.

We develop a database that allows us to track both managers and investors in a broad sample of U.S. firms. We cover 5,311 unique firms, with 7,742 different CEOs, and 7,456 institutional investors in the period from 1992 through 2018. A rich dataset is of paramount importance in an analysis that involves high dimensional fixed effects. To identify both the investor- and manager-specific effects on firms' ESG behavior, we follow Graham et al. (2012) and employ the spell method that combines firm and manager fixed effects. Unlike manager fixed effects, which are hard to isolate because managers move infrequently from one firm to another, investor fixed effects are easier to identify as each institutional investor holds a portfolio of multiple stocks that vary over time.

In the empirical analysis, we run panel regressions wherein we regress the ESG aggregate score, or its individual E, S, or, G subscore on firm-specific controls (observable characteristics), together with investor, manager, firm, and year fixed effects. We find that institutional investors play a predominant role in explaining corporate ESG. Investor fixed effects have the highest explanatory power and account for around 50% of the model R^2. When we examine the three ESG dimensions separately (i.e., E, S, and G), we find that investors' relative importance is highest in explaining firms' environmental performance and lowest in explaining governance performance.

Our main findings remain robust to a battery of tests. First, to mitigate concerns that the adjusted R^2 value is inflated in our baseline regression model due to to the inclusion of a large number of variables we conduct simulations wherein investors are randomly assigned to firms. If investor allocation did not matter, random assignment of investors should be as good as the model with the true investor fixed effects. The results from these analyses show that the adjusted R^2 we obtain using the true investor holdings is significantly greater than the value obtained with simulated investors. In fact, departing from a model without investor effects, we find that adding randomly allocated investor fixed effects to the model does not increase the adjusted R^2. Second, we also address similar concerns by tracing the presence of only a subset of all institutional investors within firms (i.e., 4,850 mutual funds instead of all 7,456 investors) and find that our main results are largely confirmed. Finally, all the results for the aggregate ESG score and its three subscores are also unaffected when we employ alternative estimations that control for additional CEO-level and institutional ownership-level variables, when we use investor-specific weights instead of dummy variables, or when we use an alternative data structure that covers investor-firm-year level observations instead of firm-year observations.

To understand the importance of investor effects, we first assess whether investor-specific attributes affect their relation with corporate ESG. That is, we classify investors according to their investment horizon and their investment style. We find significant positive effects on ESG for long-term investors, but not for short-term investors. Similarly, we document that quasi-indexers display significant positive effects on ESG performance, while transient investors have negative or insignificant effects.

The estimated investor effects on firms' ESG profiles could potentially capture two underlying mechanisms: investor "influence" through active interventions that shape firms' ESG policies, or investor "selection" wherein investors favor firms with desirable ESG profiles in their portfolio choices. In other words, investors may either drive firms towards ESG practices in line with their own preferences, or conversely, may select firms whose existing ESG profiles already match those preferences. To understand whether the estimated investor effects are consistent with either or both of these two explanations, we perform out-of-sample analyses using a sample of mutual funds and examine whether our estimated investor effects can predict investors' and their portfolio firms' ESG-related behaviors.[2]

We divide our sample into two periods and examine the association between investor effects estimated in the first half of the sample with the investors' ESG influence and selection behavior in the second half of the sample. We find strong evidence supporting investors' ESG influence. That is, there is a positive and statistically significant correlation between investor effects (estimated before 2010) and their subsequent voting behavior (after 2010). This suggests that investor fixed effects capture a desire to engage in ESG policies. In this same line, we also find that these investor effects are negatively associated with firms' environmental and social misconducts or regulatory violations in subsequent years. When it comes to investors' ESG selection, the evidence is relatively weak. There is a positive and weakly significant correlation between investor effects (estimated before 2010) and their subsequent ESG-based investments in new firms (i.e., after 2010) only when we focus on the governance dimension. Importantly, we do not find significant correlations for the ESG aggregate score. Moreover, we find that investor effects are not correlated with subsequent portfolio returns, which suggests that the estimated investor effects may not be capturing future financial performance.

Our work contributes to the literature in several ways. Prior studies have employed the three-way fixed effects model, which includes firm and year fixed effects along with either manager fixed effects (Bertrand and Schoar, 2003) or blockholder fixed effects (Cronqvist

[2] Cronqvist and Fahlenbrach (2008) provide a detailed discussion of influence versus selection in the role that blockholders play in corporate policies. Much of their discussion is consistent with our tests on influence versus selection.

and Fahlenbrach, 2008), to study the importance of manager and investor attributes, respectively, on corporate policies. We are the first to jointly examine firm, CEO, and investor heterogeneities within a *four-way fixed effects* framework that also controls for time heterogeneities. To estimate a model with so many fixed effects, building and using a large database like ours is crucial.

Besides the methodological contribution and the potential application of our analyses to other corporate policies, we show the importance of investors for corporate ESG even after controlling for manager and firm time-invariant effects. In this regard, our focus on firms' sustainability policies gives further relevance to our results, given the growing general interest in ESG and sustainability (for a review of different perspectives, see Christensen et al., 2021; Gillan et al., 2021). Ferrell et al. (2016) and Davidson et al. (2019) discuss the role of firms and CEOs in designing corporate social responsibility (CSR) or ESG practices, but we are the first to decompose and compare the relative importance of managers, investors, and firms in determining ESG policies.

Our results also corroborate and extend recent findings that investors perceive environmental and climate risks as important (Krueger et al., 2020) and that they have significant value implications (Huynh et al., 2020; Huynh and Xia, 2021). The role of institutional investors in shaping corporate governance policies is widely documented in the literature (Gillan and Starks, 2000; McCahery et al., 2016). Our findings show that investor interests are not restricted merely to the governance aspects of ESG. We find pervasive investor heterogeneities with regard to environmental and social considerations.

We also contribute to literature studying institutional ownership and CSR. Multiple studies have shown the role that institutional investors play in promoting or influencing

CSR engagement (Dyck et al., 2019; Chen et al., 2020a), especially in the case of long-term investors (Kim et al., 2019) and influential investors (Buchanan et al., 2018). Meanwhile, there is also some evidence suggesting institutional investors have “selective preferences” for CSR (Nofsinger et al., 2019). Using our estimated investor fixed effects, we examine and provide some insights on the two channels of influence and selection. We take a novel approach. While other authors use institutional ownership, we use investor fixed effects that isolate additional effects on ESG that are attributable to institutional investors after controlling for manager and firm heterogeneities.

The paper is structured as follows. Section 2 discusses our empirical methodology. Section 3 describes the data. In Section 4, we disentangle the importance of investor, manager, and firm heterogeneities for aggregate ESG and its three subscores. Section 5 explores the heterogeneous behavior of different types of investors and explores the influence and selection mechanisms. In Section 6, we provide concluding remarks.

2 Empirical Methodology

Bertrand and Schoar (2003) estimate managerial fixed effects to study how managers affect corporate policies. In a manager-firm matched panel dataset, they find that manager fixed effects are indeed relevant for a wide variety of corporate decisions. Several authors since then have used this methodology to disentangle and measure the importance of manager and firm effects. For example, Graham et al. (2012) study how firm- and manager-specific heterogeneities affect executive compensation, and Wells (2020) shows how the same heterogeneities affect accounting quality.

Cronqvist and Fahlenbrach (2008) take the investor perspective to study the effect of large shareholders on corporate policies and their outcomes. They analyze a blockholder-firm panel dataset that consists of 361 large blockholders over 1996-2001, and find that blockholder fixed effects are important for firms' investment, financial, and compensation policies.

We merge both these approaches in analyzing an investor-manager-firm matched panel dataset, which allows us to estimate investor, manager, and firm effects and their impact on ESG performance. By disentangling the importance of investor, manager, and firm heterogeneities, we can identify which of these is most influential in shaping firms' ESG policies.

2.1. Estimation Models

To analyze how investors, managers, and firms influence ESG, we use several estimations that include fixed effects to disentangle investor, manager, and firm heterogeneities. The existing approaches to isolate the influence of manager and firm fixed effects on firm policies include the spell method, the moving dummy variable approach (MDV), and the Abowd et al. (1999) method (AKM) that uses group connectivity, (see, e.g., Graham et al. (2012); Fee et al. (2013); Wells (2020)). When a manager is present only in a single firm, which is a common occurrence in these datasets, one cannot disentangle the influence of the firm and the influence of the manager on corporate policies. However, when it comes to estimating investor fixed effects we do not face that problem, because one investor can hold ownership positions in multiple firms at the same time and thus the investor effects can be isolated from the firm effects.

Thus, to test whether investors play an important role in firms' ESG policies, we estimate four models:

$$Y_{i,t} = \alpha + \beta X_{i,t} + \Gamma_{Investors} + \tau_t + \epsilon_{i,t}, \tag{1}$$

$$Y_{i,t} = \alpha + \beta X_{i,t} + \Gamma_{Investors} + \Lambda_i + \tau_t + \epsilon_{i,t}, \tag{2}$$

$$Y_{i,t} = \alpha + \beta X_{i,t} + \Gamma_{Investors} + \delta_{Managers} + \tau_t + \epsilon_{i,t}, \tag{3}$$

$$Y_{i,t} = \alpha + \beta X_{i,t} + \Gamma_{Investors} + \delta_{Managers} + \Lambda_i + \tau_t + \epsilon_{i,t}. \tag{4}$$

The dependent variable, $Y_{i,t}$, represents either the aggregate ESG score or its environmental, social, or governance subscores. In all these estimations, we include unique observations for each firm i in year t, and we control for firm-specific observable characteristics ($X_{i,t}$) and common time-specific factors (year fixed effects τ_t). As our primary objective is to identify the importance of investors for ESG performance, the main coefficients of interest are the investor fixed effects ($\Gamma_{Investors}$). Equations (2), (3), and (4) improve Equation (1), by controlling additionally for firm fixed effects (Λ_i), manager fixed effects ($\delta_{Managers}$), and firm and manager fixed effects together, respectively. To study whether and how investor fixed effects improve the explanatory power of each model, we estimate them twice: first, by excluding the investor fixed effects ($\Gamma_{Investors}$), and then by including them.

When manager and firm fixed effects i.e., $\delta_{Managers}$ and Λ_i, are estimated together, we use the spell method. This method creates a dummy variable for each unique combination of manager and firm (Graham et al., 2012; Fee et al., 2013), so that each firm-manager combination is defined as a "spell" for each manager at each firm. The estimated coefficient on the "spell" can be interpreted as the time-invariant fixed effect of the manager-firm combination on ESG.

The spell method does not require that managers be observed in several firms or that a firm have several managers. This method is ideal for our analysis because it allows estimation of investor fixed effects while controlling for unobserved manager-firm time-invariant heterogeneities. It cannot isolate the impact of managers on ESG, from the impact of firms, however, but this is not the objective of our analysis.[3]

Note that in all of the equations, investor effects ($\Gamma_{Investors}$) are isolated using dummy variables, which assumes equal weights for all investors in any firm in a given year. To test whether investors' ownership position affects our results, we alternatively use investor-specific weights instead of dummy variables and re-estimate all the models.

In our baseline models, although we control for time-specific cross-sectional variations in firms' ESG policies, an important implicit assumption is that investor fixed effects $\Gamma_{Investors}$ are constant over time. A similar assumption applies to manager fixed effects $\delta_{Managers}$ and firm fixed effects Λ_i as well. In other words, estimated fixed effects capture only time-invariant or slow-moving heterogeneity (for investors, managers, or firms). Yet, we know that investors' preferences for ESG characteristics evolve with time (Nofsinger et al., 2019; Chen et al., 2020b; Dumitrescu and Zakriya, 2022). Thus, given that we have a large number of years in our sample, we also split the sample into subperiods and evaluate whether there is a change in the influence of investors, managers, and firms on ESG over time.

[3] As our investor-manager-firm panel dataset tracks thousands of investors over time, the MDV and AKM approaches are difficult to implement in that they require the estimation of thousands of investor fixed effects. The MDV method requires that the same manager hold positions in several firms (i.e., the manager moves from one sample firm to another), which restricts the sample to a few hundred firms. Similarly, the connectedness sample identified using the AKM method is also severely constrained by diminished sample size (Andrews et al., 2008). Thus, we do not apply the MDV and AKM methods while also estimating investor fixed effects.

2.2. Measuring the Relative Importance of Investor Effects

For our full model in Equation (4), we analyze the relative importance of firm-specific controls $X_{i,t}$; year fixed effects τ_t; manager fixed effects $\delta_{Managers}$; firm fixed effects Λ_i; and investor fixed effects $\Gamma_{Investors}$ for ESG policies. To do so, we take the estimated coefficients from the full model to obtain a Shapley variance decomposition that isolates the differential impacts of each component on the model R^2. The Shapley decomposition measures how much each of the components explains of the total variations in the ESG aggregate score, or its three E, S, and G subscores. More specifically, the model R^2 is decomposed as:

$$\begin{aligned} R^2 = \frac{COV(Y_{i,t}, \widehat{Y_{i,t}})}{VAR(Y_{i,t})} &= \frac{COV(Y_{i,t}, X_{i,t}\widehat{\beta} + \widehat{\Gamma}_{Investors} + \widehat{\delta}_{Managers} + \widehat{\Lambda}_i + \widehat{\tau}_t)}{VAR(Y_{i,t})} \\ &= \frac{COV(Y_{i,t}, X_{i,t}\widehat{\beta})}{VAR(Y_{i,t})} + \frac{COV(Y_{i,t}, \widehat{\Gamma}_{Investors})}{VAR(Y_{i,t})} + \frac{COV(Y_{i,t}, \widehat{\delta}_{Managers})}{VAR(Y_{i,t})} \\ &\quad + \frac{COV(Y_{i,t}, \widehat{\Lambda}_i)}{VAR(Y_{i,t})} + \frac{COV(Y_{i,t}, \widehat{\tau}_t)}{VAR(Y_{i,t})}. \end{aligned} \tag{5}$$

This model R^2 decomposition measures the specific parts of the overall covariance of ESG values that can be attributed to each of the individual components. As our main specification estimates $\delta_{Managers}$ and Λ_i together using the spell method, their corresponding variance decomposition is also measured together (i.e., as firm-manager fixed effects).

3 Data

To analyze the effect of managers, firms, and investors, we require a panel dataset that allows us to identify and track each unique manager and investor, both over time in a given firm and also across firms each year. Thus, finding a way to combine both wide and long panel datasets is key for our analysis. We begin with the firm-level annual ESG data from Kinder, Lydenberg, Domini Research & Analytics, Inc. (KLD) that was taken over by Morgan Stanley Capital International (MSCI) in 2009. Starting in 1991, KLD covered about 650 U.S. companies each year (mainly rating the large-cap firms in the Domini 400 Social Index and the S&P 500 Index), but this number has risen considerably over the years to cover the largest 3,000 U.S. companies. The data are collected by MSCI KLD by analyzing multiple documents to assess companies on several indicators categorized into seven broad dimensions: community, diversity, employees, environment, human rights, governance, and product. We treat the sets of environment and governance indicators as two distinctive E and G dimensions, but combine the remaining five into the social (S) dimension (e.g., Dumitrescu and Zakriya, 2021). Unlike Davidson et al. (2019) and Chen et al. (2020a), we do not consider a single stakeholder-oriented measure of CSR performance. This is essential not only to avoid any possible bias due to category omission (Ferrell et al., 2016), but also to assure a rich dataset in which we can explore investors', managers', and firms' heterogeneous effects on both shareholder- and other stakeholder-oriented activities.

Next, we match the MSCI-KLD database with ExecuComp and BoardEx data, which provide annual data on managers. Although our main sample consists of all firms in the MSCI-KLD ESG database for the period 1991-2018, we reduce the final sample period to 1992-2018 because we lack managerial data for 1991. During our sample period, we can detect the movement of CEOs for each sample firm. Institutional Ownership data are obtained from Thomson Reuters 13F (The U.S. Securities and Exchange Commission requires firms with assets under management of $100m to disclose their holdings in 13F filings). In the full sample period from 1992 through 2018, we have 5,311 unique firms with 7,742 different CEOs and 7,456 different institutional investors.[4] Finally, we merge our dataset with firm-level annual accounting variables from Compustat and firm-level stock returns from the Center for Research in Securities Prices (CRSP).

In some of our analyses, we focus on a specific investor category, namely, mutual funds. To this end, we obtain data on open-ended U.S. mutual funds' holdings from 1996 through 2018 using the Thomson Reuters mutual fund holdings database. From 2004 onward, we complement this database with the CRSP Mutual Fund Portfolio Holdings data (CRSP started to report information on fund stock holdings in 2004). The data on mutual fund characteristics are from the CRSP Survivor Bias-Free U.S. Mutual Fund database. CRSP provides information on multiple share classes issued by the same fund. To avoid multiple counting, we aggregate share-class-level data to the portfolio level. That is, we calculate total net assets (TNA) as the sum of assets across all share classes, and we compute the value-weighted average of a fund's characteristics across share classes.[5]

Our data source for voting behavior is the Voting Record database from ISS Voting Analytics. This dataset provides the voting records of individual mutual funds from all shareholder meeting proposals for Russell 3000 companies from 2003 onward. The records are compiled from their N-PX filings. ISS reports fund votes on each company proposal and other proposal-level information, such as description of the proposal, proposal number, sponsor type (management or shareholder), meeting date, management recommendation, and ISS recommendation. The data on corporate violations are collected from Violation Tracker, a database produced by the Corporate

[4]Table IA.I in the Appendix shows the number of investors, firms and CEOs per year.

[5]We aggregate returns, turnover, and expenses, weighting each share class by its TNA. Fund age is computed as the month-end relative to the fund's first offer date. For the qualitative attributes of the funds, such as name or investment objective, we choose that of the oldest among all share classes.

Research Project of Good Jobs First.[6] To identify violations related to the environment, we select violations related to *environment-related offenses*, *nuclear safety violation*, and *offshore drilling violation*. To identify violations related to the social dimension, we select violations related to *employment-related offenses*, *safety-related offenses* (except for *nuclear safety violation*), and *consumer-protection-related offenses*.

3.1. Types of Institutional Investors

We classify institutional investors into different categories based on their investment horizons (Bena et al., 2017; Harford et al., 2018) and their investment styles (Bushee, 2001). We follow Harford et al. (2018) to determine if an investor has a long- or short-term horizon. Specifically, for each stock, we identify the divestment by each institutional investor in a given year as a proportion of the amount of the same stock held three years ago. As a robustness check, we also employ the two-year turnover. Next, for each investor, we measure the weighted average of stock turnover using their investment portfolio weights in each year. Investors are then categorized into long- and short-term horizon investors based on their average turnovers: long-term investors are those with 35% or lower average turnover (this corresponds to the lowest quartile of the distribution of average turnovers), while the other investors are grouped as short-term (Nguyen et al., 2020). Alternatively, instead of using the turnovers or churn rates, we follow Bushee (2001) and classify investors into dedicated, quasi-indexer, and transient investors according to their investment styles. We use the investment categories from Bushee and Goodman (2007) and Abarbanell et al. (2003) to gain further insights into other investor classifications. For each of these alternative institutional investor classifications, the data was obtained from Brian Bushee's website.

[6]Available at https://www.goodjobsfirst.org/violation-tracker

Table I reports summary statistics for the institutional investors in our dataset. Panel A shows our full sample of investors, and panel B the mutual fund sample that we use for robustness checks and to gain additional insights on the mechanisms driving our investor effects. In the full sample, on average, there are 189 investors per firm, and investors hold 214 firms in their portfolio. As explained above, we also group investors according to their horizon, i.e., long-term and short-term, and according to their style, i.e., dedicated, quasi-indexer, and transient. Long-term investors and quasi-indexer investors are the biggest categories in terms of number of investors in firms' ownership. On average, firms have almost 100 long-term investors and 115 quasi-indexers. Long-term investors and transient investors are the most diversified in terms of number of holdings, and hold on average about 270 firms in their portfolio.

Panel B shows an alternative sample of investors, and classifies mutual funds into active and passive funds. On average, active funds are present in 56 firms, while passive investors are present in almost 39 firms. Active funds hold on average 133 firms, while passive funds hold 293 firms.

3.2. Summary Statistics

Table II presents summary statistics for our primary variables of interest and for our control variables. The ESG score can be decomposed into environmental, social, and governance subscores. The environmental score includes categories such as climate change, pollution and waste, or natural capital. The social score includes categories related to human capital, product liability, or social opportunities. The governance score includes categories related to corporate governance, business ethics, or tax transparency. Each score can have positive and negative ratings. The average score in our sample period for aggregate ESG is 0.09. For the environmental score it is 0.11; for the social score it is 0.13; and for the governance score it is -0.14. Table IA.II in the Appendix provides definitions of the primary and control variables.

4 Disentangling the Importance of Investor, Manager, and Firm Heterogeneities

In this section we examine the influence of investors, managers, and firms on aggregate ESG, and then on the E, S, and G dimensions separately. Finally, we provide some robustness tests and alternative estimations to support our main results.

4.1. Aggregate ESG Performance

To test for the importance of investor, manager, and firm heterogeneities, we follow the empirical framework described in Section 2.1. That is, we regress corporate ESG on investor fixed effects, manager fixed effects, and firm fixed effects, as well as other control variables that may affect ESG. Year fixed effects are included to capture time effects in ESG.

Table III shows the results. Regression (1) is a pooled ordinary least squares (OLS) regression that includes controls and year fixed effects, but without investor, manager, or firm fixed effects. The adjusted R^2 for this regression is 20.7%, which is similar to that found in literature studying the determinants of CSR or ESG (Davidson et al., 2019; Chen et al., 2020a).

In regression (2), we add investor fixed effects in order to capture the influence of investors on ESG. The adjusted R^2 rises to 56.3%, which implies a relative increase of 172% over regression (1). This suggests that unobservable time-invariant investor heterogeneity plays a significant role in explaining aggregate ESG.

In regression (3), we exclude investor fixed effects and add firm fixed effects. The adjusted R^2 rises to 55.7%, which indicates that time-invariant firm characteristics have considerable explanatory power in determining corporate ESG.

In regression (4), we show that the addition of investor fixed effects to regression (3) increases the adjusted R^2 by 32.7%; that is, the adjusted R^2 becomes 73.9%. This shows that investor fixed effects provide additional explanatory power, even after controlling for firm fixed effects.

In regression (5) we exclude firm and investor effects, and include manager fixed effects.[7] The adjusted R^2 is 63.8%, which indicates that manager unobserved heterogeneity is also important in determining corporate ESG. Yet, when investor effects are included in regression (6), we observe that the adjusted R^2 increases by 20.5% to 76.9%.

In regression (7), we include both firm and manager fixed effects. The R^2 value for this regression is comparable to that shown in Davidson et al. (2019) using a much smaller sample of around 1,200 observations. The addition of firm fixed effects to the regression that includes manager fixed effects (5) leads to a marginal gain in the size of the adjusted R^2. In regression (8), however, when we include investor fixed effects, we observe an increase of almost 20% in the adjusted R^2 with respect to regression (7) (the adjusted R^2 is 77.2%).[8] The importance of investor effects is also confirmed when we examine the trends in the Akaike Information Criterion (AIC) instead of the adjusted R^2. Similar to

[7]We use the CEO-based sample for our main results and as a robustness test, we include additional CFO data to isolate CFO effects from CEO effects. All results remain similar when we add CFO fixed effects, suggesting CFOs have minimal effects on corporate ESG.

[8]We use the spell method when estimating manager and firm effects together, following Graham et al. (2012). Use of the AKM methodology (Abowd et al., 1999) or the MDV methodology (Bertrand and Schoar, 2003) to estimate the full regression specification is not appropriate as there are many fixed effects to be estimated: manager, firm, and investor effects. The MDV and AKM severely reduce the sample size, and we are left without enough degrees of freedom for the estimation.

the adjusted R^2, AIC corrects for the number of parameters in the model. When investor fixed effects are included in our estimations, we find that the AIC always decreases, which implies an improvement in the goodness of fit. Furthermore, F-tests suggest that these investor fixed effects are jointly different from zero (p-value < 0.001) in all regressions. Taken together, these results document the importance of investor effects in explaining the variation in corporate ESG.

Panel B of Table III summarizes the coefficients of the investor fixed effects estimated in the full regression specification, regression (8). Note that although our high-dimensional panel data tracks the presence of 7,456 unique investors in our sample firms (see Table IA.I), only 6,841 investor effects are estimated as some of the investors are omitted due to the presence of singletons or multicollinearity. We find that 10% of the estimated investor fixed effects are statistically significant at the 5% level, and 20% of them are statistically significant at the 10% level. Even after a Bonferroni correction for multiple comparisons, roughly 3% (6.5%) of the observations remain statistically significant at the 5% (10%) level.

Panel C complements the results in Panel A by using the Shapley decomposition explained in Section 2.2. This variance decomposition is useful to isolate the relative importance of different determinants of the variation in corporate ESG. Specifically, it analyzes the covariance of the components of our full regression model (i.e., regression (8) representing Equation (4)) and ESG, normalized by the variance of ESG. The normalized covariance provides the percentage of model R^2 attributable to each factor.

About 49% of the explained variation is attributable to investor fixed effects. This shows the relevance of including time-invariant investor-specific heterogeneities as a determinant to explain corporate ESG. The normalized covariance of manager and firm fixed effects with corporate ESG is 43%, while the explained variation attributable to year fixed effects and our firm controls together is around 8%.

4.2. E, S, and G Dimensions

The results so far indicate that investors have significant incremental explanatory power for ESG beyond what is explained by time-invariant firm and manager determinants, as well as year effects and other firm controls. Next, we decompose ESG into its environmental (E), social (S), and governance (G) dimensions and analyze the importance of investor, manager, and firm factors in each dimension. Results are shown in Table IV.

In panel A, on comparing the adjusted R^2 of regression (2) to that of the pooled OLS regression, we find the greatest increase for the environmental dimension. Indeed, the adjusted R^2 rises by 376% when we add investor fixed effects. The adjusted R^2 of the pooled OLS regression of the environmental dimension is the lowest when including only firm controls and year effects, but is the highest once investor effects are included. In the full regression specification (regression (8)), the environmental dimension exhibits the highest adjusted R^2 (80.1%), while the governance dimension exhibits the lowest (59.4%). Panel B summarizes the estimated investor effects' coefficients using the full model (regression (8)). We find the highest proportion of coefficients significant at 10% for environmental performance and lowest for governance performance. The Shapley decomposition in panel C shows that the time-invariant investor-specific heterogeneity is the most important determinant to explain each of the three ESG dimensions, with the highest percentage of model R^2 explained in the case of environmental performance. These results reinforce the importance of accounting for investor fixed effects in analysis of different ESG dimensions, and shed some light on the heterogeneous explanatory powers of investor effects across ESG dimensions.

The heterogeneous effects of different ESG dimensions on both firm risk and returns have been widely documented (Kim et al., 2014; Dumitrescu and Zakriya, 2021; Bae et al., 2021). Moreover, ESG-related uncertainty plays an important role in shaping ESG investment choices (Avramov et al., 2022). Of the three ESG dimensions, uncertainty and risk related to environmental factors are most difficult to assess, and yet investors show high sensitivity to firms' environmental policies (Flammer, 2013; Nofsinger et al., 2019). Our results showing the highest explanatory power for the environmental dimension are thus consistent with the growing relevance of climate and environmental risks for investors (Krueger et al., 2020; Huynh and Xia, 2021), and they plausibly show value in environmental risk mitigation (Fernando et al., 2017).

4.3. Robustness Checks

We conduct several additional analyses to support our main results. First, we study the evolution of the different fixed effects over the years to explore if their importance remains persistent across our sample period. Second, we run simulations using randomly assigned investors in firms to test the validity of our results. Third, we use an alternative database and a subset of investors to examine if our results are unaffected.

To start with, the main results presented above focus on estimating fixed effects without considering their evolution over time. In other words, we only capture the time-invariant influence of investors, managers, and firms in the full sample period: 1992-2018. Therefore, to examine the evolution of investor effects over the years, we implement a more dynamic framework by running the regressions using our full estimation model (i.e., regression (8) from the Tables III and IV) over a 15-year rolling window. Although our aim is to study the gradual evolution of the importance of each of the fixed effects, we still need a sufficiently large time window to be able to reliably estimate our fixed effects. In Figure IA.I, we show the evolution of Shapley decompositions capturing the importance of firm controls along with the investor, firm-manager, and year heterogeneities on the aggregate ESG score and its three subscores. For the ESG score, investor effects are relatively less important than firm-manager effects in the first part of the sample, whereas the opposite is true when we move into the second half of the sample years. These results show an increased explanatory power for investors when compared to firms and managers in recent years, which may be indicative of the rising prominence of ESG integration among institutional investors (Amel-Zadeh and Serafeim, 2018; Krueger et al., 2020). For the governance dimension, the investor effects seem to dominate consistently across the entire sample period. Finally, a closer examination of the overall trends in the explanatory power of investor effects also reveals that it remains persistent and stable throughout the sample years. This is particularly evident for the aggregate ESG and its governance dimension.

Next, we conducted robustness checks to address a potential methodological concern related to our empirical approach. Since we track the presence of over 7,700 investors in our sample firms, of which almost 6,800 investor effects were estimated in our main analyses, there is a possibility of overestimating the importance of investors due to the inclusion of a large number of investor dummies. Although the adjusted R^2 and the AIC account for the number of predictors in a model, we address this potential concern by exploring two alternative strategies. First, we show that the adjusted R^2 derived from the actual sample is larger than that of all the simulated models in which investors are randomly assigned to firms. Second, we employ an alternative database of investors that tracks only a subset of all investors and show that our main results hold.

In our first approach based on simulations, our aim is to test whether investor allocation affects the explanatory power of our model. If investor allocation did not matter, we could randomly assign investors to firms and the explanatory power of our model would not be affected. We compare the adjusted R^2 of the full model estimated using the actual distribution of investor holdings with that of simulated models in which investors are randomly allocated to firms. For each firm-year observation, we randomly assign investors to firms. Next, we re-estimate the full model of regression (8) in Tables III and IV. We repeat this randomization and estimation five hundred times for the aggregate ESG performance and its three E, S, and G dimensions, and store the adjusted R^2 values for each simulation. We report the results of this procedure in Figure 1. The red line reports the adjusted R^2 in our sample. Panel (a) of Figure 1 shows that none of the simulated adjusted R^2s is above the adjusted R^2 obtained using the actual sample in column (8) of Table III. This rejects the null hypothesis that investor allocation does not matter. The adjusted R^2 of the model without investor fixed effects shown in column (7) of Table III is 0.65, which is very similar to the average adjusted R^2 of the simulations reported in Panel (a) of Figure 1. Importantly, this suggests that including investor dummies, where investors are randomly assigned to firms, does not add any explanatory power to the model. Results of simulations related to the environmental, social, and governance dimensions (panels (b), (c) and (d)) show a similar picture: the adjusted R^2s obtained using the actual sample are larger than any of the simulated R^2s. We conclude that the explanatory power of the investor fixed effects in our sample is larger than what we would expect if investors were randomly allocated to firms.[9]

We also perform Kolmogorov-Smirnov (KS) tests to compare the distribution of the actual investor effects obtained in our main results (i.e., Tables III and IV) to the distribution of the simulated investor effects. The values of estimated investor effects' 25^{th} and 75^{th} percentiles are reported in Table IA.III in the Appendix, along with the statistics for the KS tests. For both the aggregate ESG and its three dimensions, we find that the actual and simulated distributions are significantly different ($p < 0.01$).

Next, our inferences on the importance of investor effects are confirmed using an alternative database with only a subset of all investors, i.e., mutual funds. We replicate the results in Tables III and IV (that use all of the 13F filing investors reported by Thomson Reuters) but now tracking only the presence of one specific investor type: mutual funds. More specifically, we use the CRSP mutual fund holdings data to check the robustness of our main results in Sections 4.1 and 4.2. In Tables IA.IV and IA.V of the Appendix, we show that our main results are unaffected even when fund fixed effects are used instead of investor fixed effects. This reaffirms the validity of the inferences from our main analyses. In these estimations, we model the presence of 4,850 investors in more than 5,300 sample firms, from which almost 4,500 fund fixed effects are estimated. Despite there being fewer investors than the number of firms or managers in these models, the importance of investors for corporate ESG is highlighted by the fact that the Shapley decomposition shows fund fixed effects explain as much as the variation of firm and

[9] We also perform simulations using three alternative approaches and then re-estimate the full model of regression (8) in Table III. First, we fix the number of firms in which each investor is present every year, and randomly reassign the firms in which the investor is present. Second, we split investors into four groups based on the average size of their portfolio holdings in the true sample, and then randomly assign investors to firms respecting the size group where they belong. Third, we fix the number of investors per firm to equal the true number of investors in our sample and then randomly assign investors to firms. Predictably, as we gradually impose additional constraints to align the characteristics of the simulated investors with those in the true sample, we notice an increase in the average adjusted R^2. However, these adjusted R^2s are well below the actual adjusted R^2. Results are available upon request.

manager fixed effects combined.

4.4. Alternative Estimations

In this section, we conduct three sets of alternative estimations to further assess the sensitivity of the results from our estimated full models. Table IA.VI of the Appendix shows the results. First, in panel A, we perform a robustness analysis in which we introduce additional manager-specific controls (CEO sex and CEO age) and institutional investor-related controls (percentage of institutional ownership and number of blockholders). While the baseline models include some common firm-based controls, we augment these additional control variables and find that most of our results remain unaffected. As the inclusion of these variables results in a big reduction in sample size, we do not include them in the main specifications.

Second, in panel B, we use investor-specific ownership weights instead of dummy variables. In our baseline specifications, we do not model the importance of each firm within each institutional investor's stock portfolios, as we merely trace the presence or absence of the stocks in their respective portfolios (using dummy variables). Alternatively, we introduce investors' exposure to each firm in their portfolio (their firm weights) in place of the investor dummies. The explanatory power of investor heterogeneities increases with this specification, as the adjusted R^2 increases marginally. Still, most of the broader interpretations and findings remain similar to what is shown in Tables III and IV. For example, for aggregate ESG, the adjusted R^2 increases from 62.4% (for firm and manager fixed effects) to 87.4% when investor fixed effects are included. Similar increments can be seen for E, S, and G dimensions. The highest adjusted R^2 for the full regression model is again for the E-score (90.2%), followed by the S-score (85.7%), and lowest for the G-score

(69.8%).

Finally, in panel C, we change the unit of observation as we consider firm-year-investor observations instead of firm-year observations. While this data structure is richer as it has multiple observations for each firm based on each investor's ownership in that firm, it is severely limited by the fact that the ESG scores are firm-specific and not investor-firm specific. We account for this by using investors' firm-level ESG exposures as the dependent variable. We do this by multiplying a firm's ESG score by the percentage holding that each investor has in that firm in their overall investment portfolio (i.e., investor's firm "x" holdings/ investor's total holdings). In other words, in these specifications, when we transform ESG scores at investor-levels, the regressions effectively measure the determinants of investors' ESG choice. Our findings, once again, remain consistent with the baseline results in Tables III and IV.

5 Understanding the Importance of Investors for ESG

5.1. Investor Effects for Different Types of Investors

To understand the importance of investor heterogeneity, we first assess whether investor-specific attributes affect the investor effects on ESG policies. We begin by classifying investors into long- and short-term investors according to their investment horizon (see Section 3.1). We run a similar analysis to that of regression (8) in Tables III and IV (i.e., the full model), with one difference: $\Gamma_{Investors}$ in Equation (4) is replaced by two variables that track the number of long- and short-term investors holding ownership positions in our sample firms.

The results are shown in panel A of Table V. We find that only the relation between long-term investors and ESG is significantly positive. For every additional long-term investor, a firm's ESG score increases by 0.0036 units. The average ESG score in our sample is 0.09 and the average firm in our sample has 99 long-term investors (see Table II), which means that 0.3564 units (99×0.0036) of the ESG score can be attributed to this type of investor. This finding is in line with Starks et al. (2017), who show that firms with higher ESG scores are more prone to have investors with longer investment horizons. Our results are also consistent with other studies showing long-term investors being more concerned about corporate ESG (Gloßner, 2019; Kim et al., 2019; Nofsinger et al., 2019).

Next, we employ Bushee (2001) classification of investors based on their investment style: dedicated, quasi-indexer, and transient investors. In this case, $\Gamma_{Investors}$ in Equation (4) is replaced by three variables that track the number of dedicated, quasi-indexer, and transient investors holding ownership positions in our sample firms. Bushee (2004) defines dedicated investors as those that *provide stable ownership and take large positions in individual firms*, transient investors *exhibit high portfolio turnover and own small stakes in portfolio companies* and quasi-indexers *trade infrequently but own small stakes (similar to an index strategy)*. Following our previous discussion on investor horizons, we would expect investors with longer investment horizons to be associated with higher ESG. The use of these investment style categories also allows us to examine investor diversification profiles and the impact of ESG on risk reduction.

In panel B of Table V, we document that only quasi-indexers exhibit a positive and statistically significant relation with ESG and its three dimensions. The average marginal effect of quasi-indexers on the ESG score is 0.005 units. This translates to 0.574 units (114.8×0.005) of ESG score attributable to quasi-indexers. Dedicated investors only display positive and significant effects in the governance dimension, while transient investors have negative or insignificant effects. Our results are consistent with those of Chen et al. (2020a), who argue that ESG can reduce market risks since it reduces potential negative externalities. Reducing market risks is particularly suitable for long-term investors and quasi-indexers (investors with low turnover and high diversification), so these type of investors have more incentives to improve corporate ESG. However, this is not the case for transient investors, with shorter investment horizons, and less so for dedicated investors that hold large investments but less diversified portfolios.

In Table IA.VII of the Appendix, we sort investors according to additional investor classifications and find that value investors, including those who prefer large or small firms, exhibit a positive and significant relation with ESG and its three dimensions. On the other hand, growth investors seem to exhibit a negative relation with corporate ESG.[10]

5.2. Underlying Mechanisms for the Estimated Investor Effects

In this section, we discuss the underlying mechanisms that could potentially explain the observed investor effects. Following the rationale in Cronqvist and Fahlenbrach (2008), the estimated investor effects for ESG can have two alternative explanations. On the one hand, an influence explanation would imply that investors actively impact firms' ESG policies. On the other hand, a selection explanation would imply that investors, given their ESG preferences, select firms with certain ESG characteristics and

[10] In Tables V and IA.VII, we have used the number of different types of investors present in each firm-year to capture the marginal effect on corporate ESG of each additional type of investor. However, our results are qualitatively similar even if we use the ownership fractions held by different types of investors instead of the number of investors.

invest in them.

To capture investors' influence on ESG policies, we run two sets of analyses. First, we study the voting outcomes of shareholder proposals. To do so, we use the ISS Voting Analytics data and select a set of proposals that are related to environmental (E), social (S), or governance (G) considerations.[11] Second, we focus on the probability of observing a corporate violation related to environmental or social concerns using the data from Violation Tracker.

Our tests on the influence versus selection mechanisms are conducted using the CRSP mutual fund holdings (instead of Thomson Reuters 13f holdings used in the main analyses). We restrict our analyses to mutual funds because the ISS Voting Analytics data that tracks individual investor voting patterns and outcomes for firms' ESG proposals are only available for mutual funds. Since the voting outcomes on shareholder proposals are only reported by ISS after 2002, we divide the sample into two periods around 2010 and estimate the investor effects (or, more precisely, the fund fixed effects) in the first part of this sample (2002-2009). The investors' ESG *influence* is then examined by testing whether these investor effects are correlated with subsequent voting behavior in new investments and the likelihood of corporate misconduct on environmental or social issues in the second part of the sample (2010-2018). To test investors' ESG *selection*, we study the correlation between investor effects (estimated ex-ante or before 2010) and the ESG profile of the new firms they subsequently invest in (2010-2018).[12]

[11] We report the list of selected proposal codes (*ISSItemOnAgendaID*) in Table IA.VIII.

[12] In Table IA.IX in the Appendix, we provide summary statistics for the dependent and independent variables used in the analyses of this section.

5.2.1. The Influence Channel

Investors may influence firms' policies through different mechanisms. A prominent channel is through their voting choices (Duan and Jiao, 2016; Fos et al., 2018; Aggarwal et al., 2019). We analyze this channel by measuring investor fixed effects in the period 2002-2009, and observing how these investors vote for ESG policies in the new firms they join subsequently, from 2010 onward.[13] Results are shown in Table IA.X. We observe a positive correlation between pre-2010 investor effects and their subsequent ESG voting policies in the new firms included in their portfolios. These positive and significant results are robust across all ESG dimensions, but are particularly strong in the case of environmental and social policies. We address the measurement error of the main explanatory variable by running weighted regressions, with weights equal to the t-statistics of the estimated fund effects. By including the interaction between firm and time fixed effects in our regressions (columns (2), (4), (6), and (8)), we can effectively capture the variation across different investors in the same firm at the same time. These results suggest that our investor effects capture how investors influence the ESG of the firms in their portfolio through their voting behavior.

For ease of interpretation, we report standardized coefficients. Therefore, in terms of economic magnitudes and using our most restrictive specification with stock-time fixed effects, a one-standard deviation increase in our estimated fixed effects leads to a 0.94% higher likelihood that a fund will vote in favor of an ESG-related proposal (column (1), which is 2% of the unconditional probability of a "For" vote). That probability increases to 2.7% for votes related to environmental policies (column (3)), or 9% of the unconditional probability of a "For" vote on those proposals. In Table VI of the Appendix,

[13] We only study investors' voting behavior for positions initiated after 2010.

we adopt a different strategy to address the measurement error of the main explanatory variable: we exclude observations pertaining to funds whose estimated fixed effects' t-statistics (in absolute value) are below the 1st percentile of the distribution across all funds. We find qualitatively similar results.[14]

We conduct a complementary test to confirm our results for the influence mechanism. In this test, the dependent variable is the probability of observing a corporate violation related to environmental or social concerns. The unit of observation in this test is a firm-quarter pair. The main independent variable is *Investors' ESG Views*, which captures the ESG orientation of a firm's investors. To construct this variable, for each firm-quarter pair, we compute the weighted average of investor effects across all investors holding the firm's shares, using each investor's ownership proportion in the firm as weights.[15] We observe in Table VII that firms with higher values of *Investors' ESG Views* (greater presence of investors with positive fund fixed effects) have significantly lower probabilities that they will be involved in subsequent corporate violations in the new firms of their portfolios. In other words, there is a negative correlation between pre-2010 investor effects and subsequent environmental or social corporate violations.[16] The (standardized) coefficient of column (1) indicates that a one-standard deviation increase in *Investors' ESG Views* leads to a 1.52% lower probability of observing a corporate violation related

[14]We also run additional tests to rule out the possibility that these results are simply capturing a direct effect of institutional ownership unrelated to ESG preferences. We perform the same analysis of Table IA.X using a set of proposals unrelated to ESG dimensions (e.g., management-initiated routine proposals), and report the results in Appendix Table IA.XII. We find no significant association between investor effects and their subsequent support for these alternative proposal types.

[15]Since the data is aggregated at the firm level, we cannot employ the same solution to address the measurement error of the main explanatory variable as in Table IA.X. However, in Appendix Table IA.XI, we exclude observations related to funds whose estimated fixed effects' t-statistics (in absolute value) are below the 1st percentile of the distribution across all funds, before aggregating the fund effects at the firm-quarter level.

[16]We perform a placebo analysis by focusing on the probability of corporate violations unrelated to environmental or social dimensions (e.g., tax violations). Results, reported in Table IA.XIII in the Appendix, show no association between *Investors' ESG Views* and subsequent tax violation probabilities.

to environmental or social concerns in subsequent quarters. This represents 24% of the unconditional probability. In our most stringent specification of Column (3), with firm and industry-time fixed effects, the effect of one-standard deviation increase in *Investors' ESG Views* remains economically significant, at 5% of the unconditional probability.

Together, the results from tests on investor voting and corporate misconduct data support the influence channel. Our estimated fund fixed effects have an impact on the voting of ESG policies and on the likelihood that firms will engage in environmental or social corporate violations. Moreover, by showing the correlation between investor effects and different ESG-related firm behaviors, we provide a point of validation for our results on the importance of investor effects. Overall, we see that our estimated investor effects have plausibly important effects on other ESG-related outcomes. This increases our confidence that investor fixed effects capture economically meaningful heterogeneities related to ESG preferences and ESG engagement.

5.2.2. Other Channels

Investors may self-select into firms whose ESG policies align well with their ESG preferences. We analyze this selection channel by studying whether the investor fixed effects estimated in the period before 2010 correlate with the ESG policies of the new firms these investors subsequently invest in. We present our results in Table VIII. The selection hypothesis is not supported by our findings. We do not find significant results except for weakly significant results in the governance dimension.

Lastly, we provide some suggestive evidence on whether the estimated fixed effects may capture beliefs about future financial performance of companies with better ESG policies. Investors' ESG preferences could be driven by their expectations of stock returns

(Pástor et al., 2021; Pedersen et al., 2021; Pástor et al., 2022). We test whether fund fixed effects estimated before 2010 correlate with the mutual funds' portfolio returns in the subsequent years. The results are reported in the Appendix Table IA.XV. Consistent with the findings in Cao et al. (2023) that ESG funds do not rely "on quantitative signals of value", we find that the fund fixed effects are uncorrelated to future returns of funds' portfolio holdings, which suggests that these fixed effects do not capture future financial performance.[17]

Overall, our findings suggest that investors with specific ESG preferences influence the ESG policies of the firms in their portfolios through voting, and also make these firms less likely to violate environmental or social regulations. We conclude that our investor effects reflect a preference for better ESG policies and a desire to engage in improving firms' ESG policies through voting. We do not find evidence supporting the idea that our fixed effects capture future financial performance, and show limited evidence supporting the selection mechanism.

6 Conclusion

In this paper we analyze the relative importance of investor-specific, manager-specific, and firm-specific attributes in explaining firms' ESG policies. Using a novel investor-manager-firm panel dataset that allows us to trace the presence of institutional investors and CEOs in firms, we study the importance of investor, manager, and firm heterogeneities (as well as the time heterogeneities) in explaining firms' ESG strategies. We believe this to be the first time a *four-way fixed effects model*

[17] These results have to be interpreted with caution as we use the realized returns in this test. It is of course possible that future beliefs on returns do not match actual future returns, so our evidence is merely indicative.

has been used to study ESG, an important corporate policy that is drawing attention from both regulators and investors.

Our results show that investor heterogeneities play a statistically and economically significant role in firms' ESG policies, both for aggregate ESG deployment and for E, S, and G dimensions individually. In fact, investor fixed effects can explain around 50% of the variations in ESG scores even after accounting for firm- and manager-variations. On examining the explanatory power of E, S, and G subscores, we document the greatest impact of investor effects on the environmental dimension and the lowest on the governance dimension.

To explain our economically important investor effects for firms' ESG behavior, we explore two important complementary channels: institutional investors' ESG preferences and their ESG engagement. Preferences are captured in investor effects, as we observe investors' ESG orientation translated into investments in better ESG firms for some investors (such as the quasi-indexers), while others either shun these stocks or are indifferent toward them (transient investors). As expected, we also find long-term investors likely to hold positions in higher ESG firms.

We show that investor effects capture investors' ESG engagement and activism through voice, as there is a significant association between the estimated investor effects and the subsequent voting outcomes of ESG-related shareholder proposals. We conclude that our results seem to be strongly driven by an influence explanation. That is, investors influence their portfolio firms through their voting behavior. This is also consistent with our findings showing a negative association between the estimated investor fixed effects and the occurrence of corporate violations related to the social and environmental regulations by portfolio firms in the subsequent years. Through this, we show that investors' pre-investment preferences and post-investment interventions together might be important for shaping ESG choices.

Application of a *four-way fixed effects model* in this paper opens a door to future research using this model to analyze other corporate policies, and to explore the utility of estimated fixed effects to predict other corporate outcomes.

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Figure I. The Importance of Investors for ESG Performance: Simulations

The figures compare the actual adjusted R^2 of column (8) of Table III (for ESG) and Table IV (for E, S, and G) with the adjusted R^2s obtained from 500 simulations based on randomized investor allocations. The red vertical line in each graph indicates the actual adjusted R^2. To obtain each placebo ownership structure, we randomize the identity of investors holding a firm in a given year.

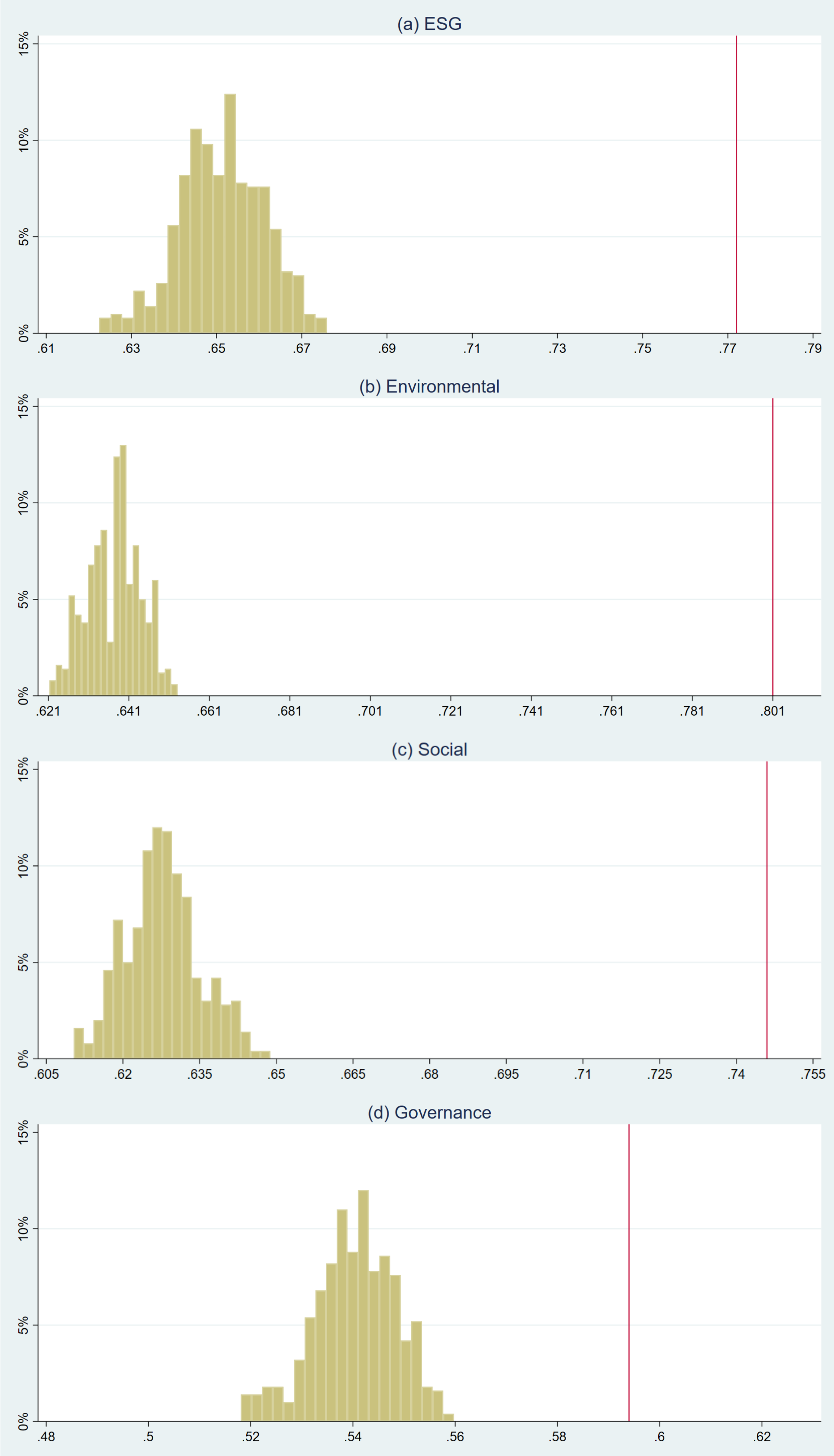

Table I. Institutional investors and their portfolio holdings of MSCI ESG sample firms

This table reports firm-level summary statistics of investors' presence and investor-level summary statistics of their portfolio holdings considering only the MSCI ESG sample firms in our a) investor-manager-firm panel (Panel A) and b) mutual fund-manager-firm panel (Panel B) datasets. In panel A, we also group the institutional investors based on investment horizons (Harford et al., 2018) and investment styles (Bushee, 2001). In Panel B, we also group mutual funds into active and passive funds.

Panel A: Institutional Investors Sample						
	# Investors per Firm			# Holdings per Investor		
	Mean	Median	Max	Mean	Median	Max
All Institutional Investors	189.3	123	3172	213.5	80	3575
Institutional Investor Type:						
1) By Investment Horizons						
Short-term	83.2	60	1783	205.7	79	3388
Long-term	99.0	59	1082	271.6	105	3575
2) By Investment Style						
Dedicated	3.0	2	36	79.2	20	3191
Quasi-Indexer	114.8	69	2014	233.5	93	3571
Transient	63.1	47	609	270.0	105	3575

Panel B: Mutual Funds Sample						
	# Funds per Firm			# Holdings per Fund		
	Mean	Median	Max	Mean	Median	Max
All Equity Mutual Funds	96.5	20	1800	161.2	70	5008
Mutual Fund Type:						
Active Funds	56.3	14	1411	132.7	68	4201
Passive Funds	38.8	11	411	292.6	82	5008

Table II. Descriptive statistics for all the main variables

This table summarizes the means, medians, standard deviations, the 5^{th} and 95^{th} percentiles, and the number of observations for all the main variables computed for the full MSCI ESG sample from 1991 to 2018. For definitions and computational details of these variables, see Appendix Table IA.II.

Variables	**Mean**	**Median**	**SD**	5^{th}%	95^{th}%	**N**
Dependant Variables:						
ESG	0.09	0.00	2.40	-3.00	4.00	41,792
Environmental (E)	0.11	0.00	0.80	-1.00	1.00	41,792
Social (S)	0.13	0.00	1.88	-2.00	4.00	41,792
Governance (G)	-0.14	0.00	0.64	-1.00	1.00	41,792
Main Regressors:						
Firm Size	7.57	7.50	1.80	4.85	10.62	41,681
Market-to-Book Ratio	4.86	4.17	2.94	0.90	10.11	41,336
Stock Returns	0.02	0.01	0.04	-0.04	0.08	37,944
Return on Assets	0.09	0.10	1.65	-0.10	0.28	41,792
Capital Expenditure	-3.79	-3.51	1.47	-6.81	-1.88	38,464
Liquidity	18.51	18.52	1.59	15.84	21.08	41,720
Leverage	0.20	0.15	0.22	0.00	0.58	41,792
Firm Age	5.05	5.24	1.04	2.94	6.31	35,323
Additional Controls:						
Number of Blockholders	2.56	2.50	1.61	0.00	5.50	27,323
Institutional Ownership	0.76	0.77	1.91	0.35	1.00	27,290
CEO's Age	55.95	56.00	7.43	44.00	68.00	34,148
Female CEO	0.03	0.00	0.17	0.00	0.00	35,049

Table III. The importance of investors, managers, and firms for ESG performance

This table shows the results obtained by running multiple regression models on the determinants of firms' ESG or CSR performance. Panel A reports estimation summary for: a) firm, manager, and investor fixed effects separately, b) each of the combinations of two out of these three fixed effects, and c) all these three fixed effects together (i.e., firm + manager + investor fixed effects). In all these estimations, firm level controls and year fixed effects are included. The first column shows pooled OLS without either firm, manager, or investor fixed effects. The spell method is used when firm and manager fixed effects are included together. For definitions of all the main and control variables see Appendix Table IA.II. Along with the R^2, adjusted R^2, and Akaike Information Criterion (AIC), we report the raw and relative change in adjusted R^2 when models in columns (2), (4), (6), and (8) respectively improve upon columns (1), (3), (5), and (7) by adding investor fixed effects. We also report the p-values for F-test of joint significance for the investor fixed effects. The significance levels for p-value of F-test for joint significance are shown by *, **, and *** for 10%, 5%, and 1% respectively. Panel B summarizes some key characteristics for the estimated investor fixed effects for the full model (last column in Panel A) along with the proportion of investor effects that are statistically significant at 10% and 5% before and after accounting for Bonferroni correction. For the same full model, Panel C lists the variance decomposition for different components (or groups of regressors) by showing Shapley values and the percentage of R^2 explained by the model. Shapley values represent the covariances between the dependent variable (ESG) and each component, normalized by the variance of ESG.

Panel A: Regressions

							SPELL METHOD	
	Pooled OLS (No Firm, Manager, or Investor Effects)	**Investor Fixed Effects** (No Firm or Manager Fixed Effects)	**Firm Fixed Effects** (No Manager or Investor Fixed Effects)	**Firm + Investor Fixed Effects** (No Manager Fixed Effects)	**Manager Fixed Effects** (No Firm or Investor Fixed Effects)	**Manager + Investor Fixed Effects** (No Firm Fixed Effects)	**Firm + Manager Fixed Effects** (No Investor Fixed Effects)	**Firm + Manager + Investor Fixed Effects** (Full Model)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Firm Controls	Y	Y	Y	Y	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y	Y	Y	Y	Y
Observations	20,988	20,988	20,988	20,988	20,988	20,988	20,988	20,988
R^2	0.208	0.724	0.615	0.868	0.708	0.898	0.717	0.900
Adj. R^2	0.207	0.563	0.557	0.739	0.638	0.769	0.647	0.772
AIC	93,200.57	75,847.09	78,018.09	70,864.26	72,237.72	65,465.93	71,574.80	65,080.88
Adj. R^2 improvements due to investor effects:								
Raw change		0.356		0.182		0.131		0.125
Relative %		171.98%		32.68%		20.53%		19.32%
p-value		0.000***		0.000***		0.000***		0.000***
(F-test for investor effects = 0)								

Panel B: Summary of Investor Fixed Effects (6,841 estimated out of 7,456)

Mean	-0.185
Median	0.000
25^{th} Percentile	-0.212
75^{th} Percentile	0.209
% with 10% (5%) Significance	19.91% (9.80%)
% with 10% (5%) Significance (Bonferroni-corrected)	6.43% (3.16%)

Panel C: Variance Decomposition

	Shapley Value	% of Model R^2
Components (# Variables):		
Firm Controls (8)	0.032	3.43%
Year Fixed Effects (26)	0.040	4.33%
Firm-Manager Fixed Effects (7,211)	0.400	43.32%
Investor Fixed Effects (6,841)	0.452	48.92%

Table IV. The importance of investors, managers, and firms for E, S, and G dimensions of ESG performance

This table shows the results obtained by running multiple regression models on the determinants of firms' environmental (E), social (S), and governance (G) performance when they are separately measured. Panel A shows estimations using: a) firm, manager, and investor fixed effects separately, b) each of the combinations of two out of these three fixed effects, and c) all these three fixed effects together or the full model. In all these estimations, firm level controls and year fixed effects are included. The first column shows pooled OLS without either firm, manager, or investor fixed effects. The spell method is used when firm and manager fixed effects are included together. For definitions of all the main and control variables see Appendix Table IA.II. Along with the R^2 and adjusted R^2, we report the raw and relative change in adjusted R^2 when models in columns (2), (4), (6), and (8) respectively improve upon columns (1), (3), (5), and (7) by adding investor fixed effects. The significance levels for p-value of F-test for joint significance of all investor fixed effects are shown by *, **, and *** at 10%, 5%, and 1% respectively. Panel B summarizes some key characteristics for the estimated investor fixed effects from the full model (last column in Panel A) and the proportion of investor effects significant at 10% and 5% levels (with and without Bonferroni correction), while Panel C lists the variance decomposition for different components by showing Shapley values and the percentage of R^2 explained using the same full model.

Panel A: Regressions

	Pooled OLS (No Firm, Manager, or Investor Fixed Effects) (1)	**Investor Fixed Effects** (No Firm or Manager Fixed Effects) (2)	**Firm Fixed Effects** (No Manager or Investor Fixed Effects) (3)	**Firm + Investor Fixed Effects** (No Manager Fixed Effects) (4)	**Manager Fixed Effects** (No Firm or Investor Fixed Effects) (5)	**Manager + Investor Fixed Effects** (No Firm Fixed Effects) (6)	SPELL METHOD: **Firm + Manager Fixed Effects** (No Investor Fixed Effects) (7)	SPELL METHOD: **Firm + Manager + Investor Fixed Effects** (Full Model) (8)
Environmental (E)								
Adj. R^2	0.127	0.605	0.476	0.761	0.614	0.798	0.639	0.801
Adj. R^2 improvements due to investor effects:								
Raw change		0.478		0.285		0.184		0.162
Relative %		376.38%		59.87%		29.97%		25.35%
p-value *(F-test for investor effects = 0)*		0.000***		0.000***		0.000***		0.000***
Social (S)								
Adj. R^2	0.206	0.511	0.547	0.708	0.621	0.744	0.628	0.746
Adj. R^2 improvements due to investor effects:								
Raw change		0.305		0.161		0.123		0.118
Relative %		148.06%		29.43%		19.81%		18.79%
p-value *(F-test for investor effects = 0)*		0.000***		0.000***		0.000***		0.000***
Governance (G)								
Adj. R^2	0.192	0.418	0.374	0.563	0.453	0.593	0.456	0.594
Adj. R^2 improvements due to investor effects:								
Raw change		0.226		0.189		0.140		0.138
Relative %		117.71%		50.53%		30.91%		30.26%
p-value *(F-test for investor effects = 0)*		0.000***		0.000***		0.000***		0.000***

Panel B: Summary of Investor Fixed Effects (6,841 estimated out of 7,456)

	Environmental (E)	**Social (S)**	**Governance (G)**
Mean	0.106	-0.346	0.056
Median	0.000	0.000	0.000
25^{th} Percentile	-0.076	-0.193	-0.084
75^{th} Percentile	0.077	0.184	0.085
% with 10% (5%) Significance	22.18% (11.67%)	21.73% (11.09%)	19.04% (7.98%)
% with 10% (5%) Significance (Bonferroni-corrected)	7.31% (4.12%)	7.11% (3.90%)	6.64% (2.87%)

Panel C: Variance Decomposition

	Environmental (E)		**Social (S)**		**Governance (G)**	
Components (# Variables):	Shapley Value	% Model R^2	Shapley Value	% Model R^2	Shapley Value	% Model R^2
Firm Controls (8)	0.033	3.49%	0.023	2.48%	0.029	3.60%
Year Fixed Effects (26)	0.036	3.81%	0.035	3.78%	0.028	3.47%
Firm-Manager Fixed Effects (7,211)	0.409	43.33%	0.411	44.18%	0.367	45.55%
Investor Fixed Effects (6,841)	0.466	49.36%	0.454	49.06%	0.382	47.38%

Table V. Average investor effects for different types of investors

This table summarizes the coefficients of investor effects when the investors are grouped based on their investment horizons (Panel A) and investor styles or preferences (Panel B). In Panel A, following Harford et al. (2018), we split all the investors into short- and long-term investors, and then count the number of investor types in each of our sample firms. In panel B, we classify investors into dedicated, quasi-indexer, and transient investors (Bushee, 2001) and count them. We estimate investor type effects using the model with firm, manager, and investors effects (full model similar to the last column of Table III) and replacing investor dummies by investor type counts. The results are reported both for the ESG score as the dependent variable, and its three E, S, and G dimensions taken separately. In all these estimations, firm controls and year fixed effects are included. The robust t-statistics in each regressions are clustered at firm-level and reported in parentheses. For each of the coefficients, *, **, and *** represent the significance levels at 10%, 5%, and 1% respectively.

Panel A: Long-term / Short-term Horizon classification				
	ESG	Environmental (E)	Social (S)	Governance (G)
Short-term	-0.0006	0.0001	-0.0003	-0.0005
	(-0.15)	(0.39)	(-0.29)	(-1.25)
Long-term	0.0036***	0.0027***	0.0033***	0.0020***
	(3.17)	(7.49)	(3.55)	(3.72)
Firm Controls + Year Effects	Y	Y	Y	Y
Observations	11,054	11,054	11,054	11,054
Adj. R^2	0.625	0.639	0.601	0.423
Panel B: Transient / Quasi-indexer / Dedicated classification				
	ESG	Environmental (E)	Social (S)	Governance (G)
Dedicated	0.0323	-0.0062	0.0234	0.0151**
	(1.34)	(-0.74)	(1.28)	(2.02)
Quasi-Indexer	0.0050***	0.0035***	0.0001	0.0013***
	(4.22)	(8.21)	(0.08)	(4.44)
Transient	-0.0018	-0.0021***	0.0011	-0.0008*
	(-1.23)	(-3.81)	(0.94)	(-1.75)
Firm Controls + Year Effects	Y	Y	Y	Y
Observations	14,394	14,394	14,394	14,394
Adj. R^2	0.628	0.633	0.618	0.470

Table VI. Fund effects and subsequent ESG voting behavior

This table explores the relation between fund fixed effects and subsequent mutual funds' voting behavior. The dependent variable is coded as one if a fund votes in favor ("For") of a given proposal. The main independent variable is the fund-specific effect estimated as in Equation 4. We divide the mutual fund voting sample into two parts around the year 2010. We show the estimations from running regressions of fund effects measured out-of-sample (i.e., in the first half of the mutual fund voting sample – 2002 to 2009) on their ESG voting behaviour over the second part of the sample (2010-2018). We also exclude from the sample of voting proposals firms that were already in the portfolio of funds in the period 2002–2009. We address the measurement error of the main explanatory variable by running weighted regressions on the resulting sample, with weights equal to the t-statistics of the estimated fund effects. Firm Controls include size, Tobin's Q, leverage, and ROA. Fund Controls include fund size, expense ratio, turnover, fund flows, fund age, and family size. The coefficients are expressed in percentage. The t-statistics clustered at the firm level are reported in parentheses.

	ESG		E		S		G	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Fund Effects	0.184*	0.181*	0.435***	0.435***	0.357***	0.359***	0.055**	0.051**
	(1.85)	(1.82)	(3.43)	(3.44)	(5.41)	(5.47)	(2.10)	(1.98)
ISS Recommendation	45.236***	43.775***	24.553***	26.284***	30.430***	32.404***	59.569***	60.958***
	(20.17)	(15.85)	(8.95)	(7.23)	(10.50)	(9.18)	(14.31)	(11.36)
Firm Controls	Y		Y		Y		Y	
Fund Controls	Y	Y	Y	Y	Y	Y	Y	Y
Firm FE	Y		Y		Y		Y	
Time FE	Y		Y		Y		Y	
Firm x Time FE		Y		Y		Y		Y
Observations	102,226	102,215	23,035	23,035	22,885	22,885	56,305	56,295
Adjusted r^2	0.375	0.433	0.187	0.210	0.209	0.229	0.378	0.438

Table VII. Fund effects and subsequent corporate violations

This table explores the relation between fund effects and subsequent environmental and social corporate violations. The dependent variable is the average probability that the company is involved in a corporate violation of each type. To construct our main independent variable, for each firm-date (year-quarter) pairs in our sample, we compute the weighted average of investor effects across all investors that own firm shares in a given quarter, using the investor ownership as weights. We construct the variable *Funds' ESG Views* using fund effects resulting from an estimation performed using the mutual fund voting sample for the period 2002–2009. We then study the impact of these fund effects on the probability of corporate violations over the sample 2010-2018. Moreover, we exclude from the sample firms that were already in the portfolio of funds in the period 2002–2009. We report the results of regressions with firm-level controls, industry-time fixed effects, and firm fixed effects. Firm Controls include size, Tobin's Q, leverage, and ROA. The coefficients are expressed in percentage. The t-statistics clustered at the firm level are reported in parentheses.

		E & S Violations			E Violations			S Violations	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Funds' ESG Views	-1.518***	-0.954***	-0.340***	-0.479***	-0.309***	-0.145***	-1.170***	-0.693***	-0.190**
	(-6.22)	(-4.95)	(-3.46)	(-4.70)	(-3.28)	(-2.87)	(-5.82)	(-4.39)	(-2.54)
Firm Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y
Industry X Time FE		Y	Y		Y	Y		Y	Y
Firm FE			Y			Y			Y
Observations	98,630	98,630	98,630	98,630	98,630	98,630	98,630	98,630	98,630
Adjusted R^2	0.049	0.083	0.356	0.021	0.039	0.269	0.037	0.061	0.298

Table VIII. Fund effects and subsequent ESG performance

This table explores the relation between fund effects and out-of-sample ESG performance. We first compute the fund fixed effects as in Equation 4 using the mutual fund-manager-firm panel for a sample ending in 2009. We next compute weighted average ESG scores for each fund using the new portfolio investments they initiate after 2010, where each new firm investment is weighted by the proportion of fund's total net asset invested in each year. Finally, we estimate the relationship between the estimated out-of-sample (before 2010) fund effects and the average ESG scores in the subsequent period (2010-2018). We report the results using both the aggregate ESG performance and its three E, S, and G sub-scores when all mutual funds are taken together (Panel A) and when active and passive mutual funds are taken separately (Panels B and C, respectively). The fund effects come from the estimation performed in the last column of Panel A in Tables IA.IV and IA.V. We exclude funds whose t-statistics of the estimated fixed effects is below the 1st percentile of the distribution across all funds. The coefficients are expressed in percentage. The t-statistics clustered at the firm level are reported in parentheses.

	ESG		Environmental (E)		Social (S)		Governance (G)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Fund Effects	0.0094	0.0079	-0.0119	-0.0103	0.0032	0.0040	0.0142*	0.0113*
	(1.11)	(0.99)	(-1.39)	(-1.26)	(0.38)	(0.53)	(1.66)	(1.80)
Fund Controls	Y	Y	Y	Y	Y	Y	Y	Y
Year FE		Y		Y		Y		Y
Observations	13,654	13,654	13,654	13,654	13,654	13,654	13,654	13,654
Adj. R^2	0.033	0.141	0.032	0.124	0.027	0.233	0.001	0.465

Internet Appendix for "What drives corporate ESG? Disentangling the importance of investors, managers, and firms"

In this Appendix, we provide additional statistics and robustness tests for the analyses in the article. Specifically:

References

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Bushee, B. J., Goodman, T. H., 2007. Which institutional investors trade based on private information about earnings and returns? Journal of Accounting Research 45, 289–321.

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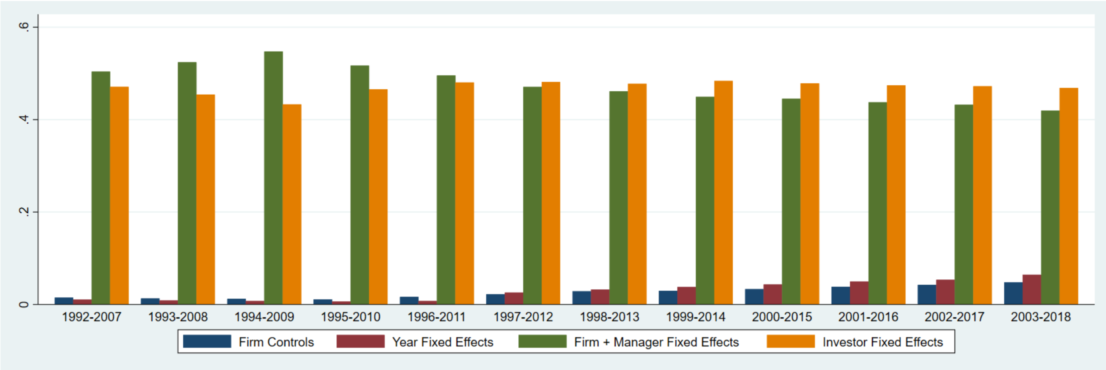
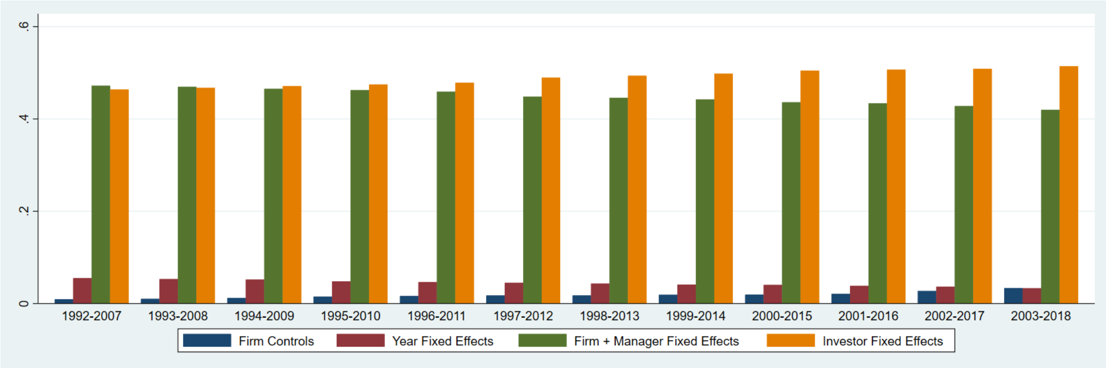
Figure IA.I. The Importance of Investors for ESG performance: Evolution Over Time

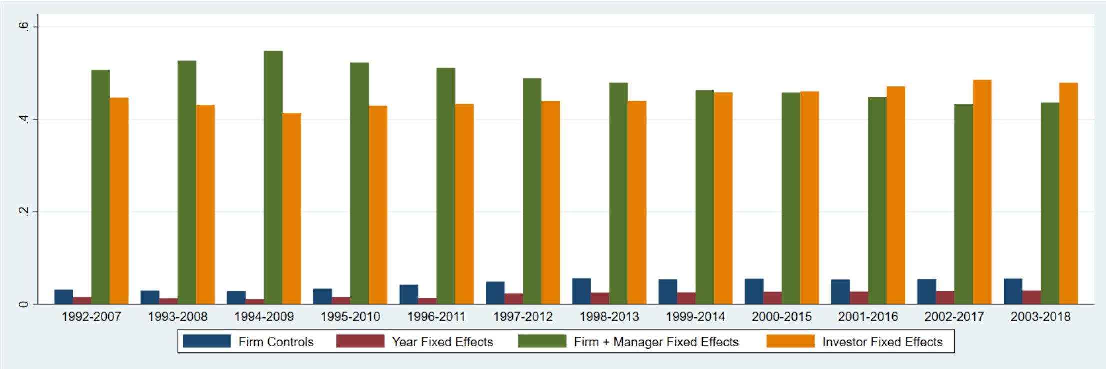
The figures below summarize the Shapley decomposition of R^2 for ESG performance and its three E, S, and G dimensions for a moving 15-year period across our sample years. To draw comparisons between the importance of firm controls, year fixed effects, firm + manager fixed effects, and investor fixed effects, we employ the full model used in the last column of Tables III and IV.



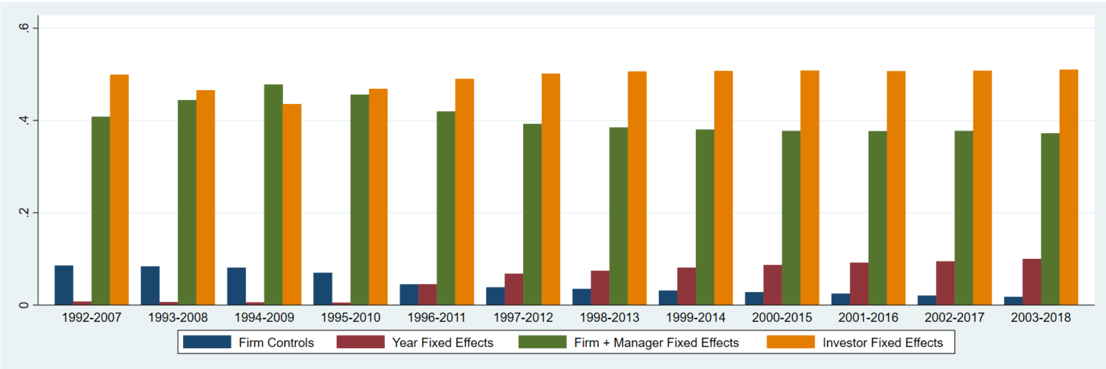
(a) ESG



(b) Environmental



(c) Social



(d) Governance

Table IA.I. The investor-manager-firm panel of MSCI-KLD ESG sample firms

For the MSCI-KLD ESG sample firms, this table summarizes the number of investors, firms, and managers that we trace through the years. For the summary of firms, we include only those firms that have all requisite firm-specific control variables available from COMPUSTAT. Investors' list is obtained form Thomson Reuters 13f data, and the managers (CEOs) are identified using BoardEx and ExecuComp data.

Year	# Investors	# Firms	# CEOs (Managers)	% CEOs of Firms
1992	1092	271	132	48.71%
1993	1186	287	204	71.08%
1994	1187	291	223	76.63%
1995	1272	344	256	74.42%
1996	1354	362	270	74.59%
1997	1481	378	285	75.40%
1998	1605	390	301	77.18%
1999	1792	509	325	63.85%
2000	1921	419	367	87.59%
2001	1961	799	657	82.23%
2002	2070	839	714	85.10%
2003	2217	2182	1644	75.34%
2004	2362	2305	1859	80.65%
2005	2566	2280	1880	82.46%
2006	2770	2298	1902	82.77%
2007	3026	2348	2004	85.35%
2008	3087	2415	2098	86.87%
2009	3062	2439	2105	86.31%
2010	3101	2571	2192	85.26%
2011	3274	2457	2124	86.45%
2012	3387	2525	2173	86.06%
2013	3676	2509	2089	83.26%
2014	3926	2476	2081	84.05%
2015	4131	2330	2042	87.64%
2016	4293	2034	1842	90.56%
2017	4465	1907	1716	89.98%
2018	4296	1927	1560	80.95%
Full Sample	7456	5311	7742	

Table IA.II. Variable definitions

Dependant Variables:	
ESG / CSR Performance	It is computed as the net ESG score ($ESG_{(Strengths)} - ESG_{(Concerns)}$) i.e., the total ESG strengths minus the ESG concerns for a firm in the given year.
Environmental (E) Performance	Similar as ESG, but only using environmental strengths and concerns from within the ESG.
Social (S) Performance	The social score using the same formula as ESG, but only including the Community, Diversity, Employee Relations, Human Rights and Product indicator sets from MSCI KLD ESG Stats.
Governance (G) Performance	Similar to E and S, but using governance strengths and concerns from within the ESG.
Main Regressors:	
Firm Size	The logarithmic transformation of total assets.
Market-to-Book Ratio	The log of market value of common equity divided by its book value. Book value (BV) is the sum of common equity BV and deferred taxes (Compustat items 60 and 74).
Stock Returns	Average monthly stock returns.
Return on Assets	Operating income before depreciation (Compustat data item 13) / Total assets (Compustat data item 6)
Capital Expenditure	The log transformation of the ratio of Capital Expenditures to Total Assets.
Liquidity	Log of stock volume traded in the calendar year for the firm's common equity.
Leverage	The ratio of long term debt (Compustat data item 9) to total assets (Compustat data item 6).
Firm Age	Log transformation of firm age measured in months at the end of each calendar year.
Additional Controls:	
Number of Blockholders	Blockholding count for a firm. Blockholders are defined as the institutional investors with a minimum of 5% firm ownership. The average quarterly values are used for computing annual blockholding count.
Institutional Ownership	Percentage institutional ownership (IO), which is the ratio of number of firm's shares held by institutions (according to 13f filings) and the total number of shares outstanding. Quarterly values are converted to Annual IO by taking the averages.
CEO's Age	The CEO's age in years.
Female CEO	A variable indicating if the CEO is female.

Table IA.III. Distributions of investor fixed effects: Actual versus simulated

This table summarizes the distribution of investor fixed effects obtained for our firm-manager-investor panel dataset and compares it to the distribution of investor effects obtained from 500 simulations in which firms' ownership structure is randomized. In these simulations, the placebo ownership structures are obtained by randomizing the identity of investors holding a firm in a given year. We report the 25^{th} and 75^{th} percentiles for the distribution of investor fixed effects obtained from full models shown in Tables III and IV (i.e., regression that includes firm + manager + investor fixed effects using the spell method). Alongside the actual distribution, the distribution of average simulated investor effects is also shown. To compare these two distributions, we follow Cronqvist and Fahlenbrach (2008) and perform two-sample Kolmogorov-Smirnov (KS) tests. For the aggregate ESG and its three dimensions, we report the D-statistics and p-values obtained from the KS tests.

	Simulated Distribution		Actual Distribution		KS Test	
	25^{th} Percentile	75^{th} Percentile	25^{th} Percentile	75^{th} Percentile	D	p-value
ESG Performance	-0.002	0.002	-0.226	0.212	0.433***	0.000
Environmental (E)	-0.001	0.001	-0.062	0.061	0.427***	0.000
Social (S)	-0.002	0.002	-0.193	0.184	0.381***	0.000
Governance (G)	-0.001	0.001	-0.084	0.085	0.121***	0.000

Table IA.IV. The importance of mutual funds, managers, and firms for ESG performance

This table replicates the results obtained in Table III using an alternative investors' holdings data that only traces mutual funds' investments in firms instead of that of all the institutional investors. Thus, here the investor fixed effects are replaced by fund fixed effects. Panel A reports estimation summary for: a) firm, manager, and fund fixed effects separately, b) each of the combinations of two out of these three fixed effects, and c) all these three fixed effects together (i.e., firm + manager + fund fixed effects). In all these estimations, firm level controls and year fixed effects are included. The first column shows pooled OLS without either firm, manager, or fund fixed effects. The spell method is used when firm and manager fixed effects are included together. For definitions of all the main and control variables see Appendix Table IA.II. Along with the R^2 and adjusted R^2, we report the raw and relative change in adjusted R^2 when models in columns (2), (4), (6), and (8) respectively improve upon columns (1), (3), (5), and (7) by adding fund fixed effects. We also report the p-values for F-test of joint significance for the fund fixed effects. The significance levels for p-value of F-test for joint significance are shown by *, **, and *** for 10%, 5%, and 1% respectively. Panel B summarizes some key characteristics for the estimated fund fixed effects for the full model (last column in Panel A) along with the proportion of investor effects significant at 10% and 5% Bonferroni-corrected significance levels. For the same full model, Panel C lists the variance decomposition for different components (or groups of regressors) by showing Shapley values and the percentage of R^2 explained by the model. Shapley values represent the covariances between the dependent variable (ESG) and each component, normalized by the variance of ESG.

Panel A: Regressions

							SPELL METHOD	
	Pooled OLS (No Firm, Manager, or Fund Effects)	**Fund Fixed Effects** (No Firm or Manager Fixed Effects)	**Firm Fixed Effects** (No Manager or Fund Fixed Effects)	**Firm + Fund Fixed Effects** (No Manager Fixed Effects)	**Manager Fixed Effects** (No Firm or Fund Fixed Effects)	**Manager + Fund Fixed Effects** (No Firm Fixed Effects)	**Firm + Manager Fixed Effects** (No Fund Fixed Effects)	**Firm + Manager + Fund Fixed Effects** (Full Model)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Firm Controls	Y	Y	Y	Y	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y	Y	Y	Y	Y
Observations	18,068	18,068	18,068	18,068	18,068	18,068	18,068	18,068
R^2	0.147	0.715	0.582	0.833	0.704	0.873	0.713	0.876
Adj. R^2	0.146	0.618	0.536	0.743	0.641	0.779	0.651	0.783
Adj. R^2 improvements due to fund effects:								
Raw change		0.472		0.207		0.138		0.132
Relative %		323.29%		38.62%		21.53%		20.28%
p-value		0.000***		0.000***		0.000***		0.000***
(F-test for fund effects = 0)								

Panel B: Summary of Fund Fixed Effects (4,544 estimated out of 4,850)

Mean	-0.051
Median	0.000
25^{th} Percentile	-0.149
75^{th} Percentile	0.144
% with 10% (5%) Significance	17.49% (7.32%)
% with 10% (5%) Significance (Bonferroni-corrected)	5.98% (2.73%)

Panel C: Variance Decomposition

	Shapley Value	% of Model R^2
Components:		
Firm Controls	0.027	3.08%
Year Fixed Effects	0.035	4.02%
Firm-Manager Fixed Effects	0.412	46.76%
Fund Fixed Effects	0.407	46.15%

Table IA.V. The importance of mutual funds, managers, and firms for E, S, and G dimensions of ESG.

This table replicates the results obtained in IV using an alternative investors' sample that only traces mutual funds' holdings in firms instead of all institutional investors' holdings. Panel A shows estimations using: a) firm, manager, and mutual fund fixed effects separately, b) each of the combinations of two out of these three fixed effects, and c) all these three fixed effects together or the full model. In all these estimations, firm level controls and year fixed effects are included. The first column shows pooled OLS without either firm, manager, or mutual fund fixed effects. The spell method is used when firm and manager fixed effects are included together. For definitions of all the main and control variables see Appendix Table IA.II. Along with the R^2 and adjusted R^2, we report the raw and relative change in adjusted R^2 when models in columns (2), (4), (6), and (8) respectively improve upon columns (1), (3), (5), and (7) by adding fund fixed effects. The significance levels for p-value of F-test for joint significance of all investor fixed effects are shown by *, **, and *** at 10%, 5%, and 1% respectively. Panel B summarizes some key characteristics for the estimated fund fixed effects from the full model (last column in Panel A), while Panel C lists the variance decomposition for different components by showing Shapley values and the percentage of R^2 explained using the same full model.

Panel A: Regressions

	Pooled OLS (No Firm, Manager, or Investor Fixed Effects) (1)	**Investor Fixed Effects** (No Firm or Manager Fixed Effects) (2)	**Firm Fixed Effects** (No Manager or Investor Fixed Effects) (3)	**Firm + Investor Fixed Effects** (No Manager Fixed Effects) (4)	**Manager Fixed Effects** (No Firm or Investor Fixed Effects) (5)	**Manager + Investor Fixed Effects** (No Firm Fixed Effects) (6)	**SPELL METHOD** **Firm + Manager Fixed Effects** (No Investor Fixed Effects) (7)	**SPELL METHOD** **Firm + Manager + Investor Fixed Effects** (Full Model) (8)
Environmental (E)								
Adj. R^2	0.121	0.634	0.473	0.747	0.638	0.795	0.649	0.799
Adj. R^2 improvements due to investor effects:								
Raw change		0.513		0.274		0.157		0.150
Relative %		423.97%		57.93%		24.61%		23.11%
p-value *(F-test for fund effects = 0)*		0.000***		0.000***		0.000***		0.000***
Social (S)								
Adj. R^2	0.162	0.572	0.545	0.712	0.635	0.754	0.642	0.756
Adj. R^2 improvements due to investor effects:								
Raw change		0.410		0.167		0.119		0.114
Relative %		253.09%		30.64%		18.74%		17.76%
p-value *(F-test for fund effects = 0)*		0.000***		0.000***		0.000***		0.000***
Governance (G)								
Adj. R^2	0.171	0.464	0.351	0.563	0.447	0.612	0.451	0.615
Adj. R^2 improvements due to investor effects:								
Raw change		0.293		0.212		0.165		0.164
Relative %		171.35%		60.40%		36.91%		36.36%
p-value *(F-test for fund effects = 0)*		0.000***		0.000***		0.000***		0.000***

Panel B: Summary of Investor Fixed Effects (4,544 estimated out of 4,850)

	Environmental (E)	**Social (S)**	**Governance (G)**
Mean	0.106	-0.346	0.056
Median	0.000	0.000	0.000
25^{th} Percentile	-0.076	-0.193	-0.084
75^{th} Percentile	0.077	0.184	0.085
% with 10% (5%) Significance	19.64% (8.19%)	17.36% (7.92%)	16.11% (6.47%)
% with 10% (5%) Significance (Bonferroni-corrected)	7.05% (3.38%)	6.23% (3.16%)	5.71% (2.43%)

Panel C: Variance Decomposition

	Environmental (E)		**Social (S)**		**Governance (G)**	
Components:	Shapley Value	% Model R^2	Shapley Value	% Model R^2	Shapley Value	% Model R^2
Firm Controls	0.033	3.49%	0.023	2.48%	0.029	3.60%
Year Fixed Effects	0.036	3.81%	0.035	3.78%	0.028	3.47%
Firm-Manager Fixed Effects	0.409	43.33%	0.411	44.18%	0.367	45.55%
Investor Fixed Effects	0.466	49.36%	0.454	49.06%	0.382	47.38%

Table IA.VI. Additional analyses for investor fixed effects.

This table summarizes the adjusted R^2 values obtained for the firms' overall ESG performance (ESG), and the performance on each of the three dimensions E, S, and G taken separately. Similar to the baseline results in Table III, we estimate multiple regression models: a) firm, manager, and investor fixed effects separately, b) each of the combinations of two out of these three fixed effects, and c) all these three fixed effects together (i.e., firm + manager + investor fixed effects). In all these estimations, year fixed effects are included. The first column shows pooled OLS without either firm, manager, or investor fixed effects, but including the year fixed effects. The spell method is used whenever firm and manager fixed effects are included together. In Panel A, we control for additional manager-specific and institutional investor-related observable characteristics. Panel B uses investor-specific weights instead of dummy variables for each institutional investor. Lastly, Panel C reports results using an alternate investor-firm level panel data instead of using firm-level panel data.

							SPELL METHOD	
	Pooled OLS (No Firm, Manager, or Investor Fixed Effects)	**Investor Fixed Effects** (No Firm or Manager Fixed Effects)	**Firm Fixed Effects** (No Manager or Investor Fixed Effects)	**Firm + Investor Fixed Effects** (No Manager Fixed Effects)	**Manager Fixed Effects** (No Firm or Investor Fixed Effects)	**Manager + Investor Fixed Effects** (No Firm Fixed Effects)	**Firm + Manager Fixed Effects** (No Investor Fixed Effects)	**Firm + Manager + Investor Fixed Effects** (Full Model)
Panel A: Additional CEO and institutional investment controls:								
ESG	0.233	0.718	0.579	0.821	0.660	0.837	0.664	0.838
Environmental (E)	0.140	0.711	0.505	0.842	0.648	0.872	0.651	0.874
Social (S)	0.187	0.587	0.556	0.787	0.622	0.828	0.605	0.822
Governance (G)	0.180	0.506	0.383	0.650	0.451	0.679	0.452	0.681
Observations	13,570	13,570	13,570	13,570	13,570	13,570	13,570	13,570
Panel B: Using investor-specific weights instead of investor dummy variables:								
ESG	0.149	0.663	0.539	0.835	0.614	0.862	0.624	0.874
Environmental (E)	0.098	0.731	0.475	0.868	0.608	0.886	0.621	0.902
Social (S)	0.167	0.612	0.552	0.812	0.614	0.834	0.623	0.857
Governance (G)	0.186	0.486	0.388	0.656	0.464	0.682	0.468	0.698
Observations	20,988	20,988	20,988	20,988	20,988	20,988	20,988	20,988
Panel C: Using investor-firm level data instead of firm level data:								
ESG	0.034	0.169	0.144	0.563	0.164	0.624	0.165	0.625
Environmental (E)	0.029	0.161	0.119	0.544	0.142	0.625	0.134	0.627
Social (S)	0.039	0.178	0.156	0.560	0.168	0.606	0.166	0.607
Governance (G)	0.041	0.191	0.168	0.413	0.179	0.468	0.168	0.470
Observations	4,135,528	4,135,528	4,135,528	4,135,528	4,135,528	4,135,528	4,135,528	4,135,528

Table IA.VII. Alternative investor classifications

This table shows the coefficients for investors grouped using different classification criteria, when they are regressed on the firms' overall ESG performance (ESG), and the performance on each of the three dimensions E, S, and G taken separately. The basic specification is similar to the one reported in the baseline regressions in Tables III and IV, but with the magnitude of investor fixed effects isolated using various investor classifications: Panel A - Growth style (Bushee and Goodman, 2007) and Panel B - Investment style (Abarbanell et al., 2003).

Panel A: Growth style classification

	ESG	Environmental (E)	Social (S)	Governance (G)
Growth & Income	0.0135***	0.0058***	0.0135***	0.0031***
	(6.55)	(7.21)	(6.55)	(5.00)
Growth	-0.0211***	-0.0071***	-0.0211***	-0.0037***
	(-8.01)	(-7.75)	(-8.01)	(-4.06)
Value	0.0067**	0.0031***	0.0067**	0.0007
	(2.54)	(2.88)	(2.54)	(0.78)
Firm Controls + Year Effects	Y	Y	Y	Y
Observations	14,394	14,394	14,394	14,394
Adj. R^2	0.636	0.638	0.636	0.472

Panel B: Investment style classification

	ESG	Environmental (E)	Social (S)	Governance (G)
Large Growth style	-0.0128***	-0.0030***	-0.0085***	-0.0013
	(-4.42)	(-3.34)	(-3.84)	(-1.25)
Large Value style	0.0146***	0.0084***	0.0040*	0.0021**
	(4.84)	(7.53)	(1.71)	(2.30)
Small Growth style	-0.0098***	-0.0039***	-0.0036*	-0.0023***
	(-3.87)	(-4.11)	(-1.87)	(-2.88)
Small Value style	0.0165***	0.0039***	0.0092***	0.0035***
	(7.21)	(4.45)	(5.06)	(5.16)
Firm Controls + Year Effects	Y	Y	Y	Y
Observations	14,394	14,394	14,394	14,394
Adj. R^2	0.637	0.638	0.623	0.472

Table IA.VIII. Shareholder proposals

This table lists the codes used to identify shareholder proposals related to environmental, social, and governance issues in the ISS Voting Analytics database (variable *ISSItemOnAgendaID*).

Environmental Proposals	S0220, S0224, S0777, S0778, S0779, S0780, S0781, S0782, S0730, S0740, S0730, S0731, S0735, S0736, S0737, S0738, S0741, S0742, S0743, S0744, S0745, S0734, S0703, S0704, S0708, S0709, S0710, S0711, S0725, S0727, S0728, S0729, S0732, S0733, S0734, S0890, S0891, S0892.
Social Proposals	S0507, S0510, S0815, S0817, S0999, S0206, S0227, S0411, S0412, S0416, S0417, S0423, S0806, S0808, S0809, S0811, S0812, S0814, S0815, S0816, S0817, S0602.
Governance Proposals	S0209, S0213, S0318, S0321, S0517, S0516, S0502, S0503, S0506, S0515, S0520, S0512, S0527, S0531, S0532, S0501, S0504, S0508, S0501, S0503, S0504, S0508, S0511, S0512, S0516, S0520, S0521, S0204, S0203, S0211, S0214, S0215, S0230, S0202, S0219, S0225, S0234, S0107, S0201, S0202, S0222, S0107, S0201, S0205, S0212, S0236, S0810, S0311, S0207, S0302, S0303, S0311, S0326, S0332, S0332, S0126, S0237, S0146, S0221, S0226, S0304, S0305, S0307, S0308, S0617.

Table IA.IX. Descriptive statistics for supplementary analyses

This table summarizes the means, medians, standard deviations, the 5^{th} and 95^{th} percentiles, and the number of observations for all the main variables used in the supplementary tests employed in Section 5.2. Panels A and B report the variables used for the tests on the influence channel using ESG voting behavior and corporate violations, respectively. Panel C summarizes the variables employed in testing other potential channels using funds' ESG performance and portfolio returns.

Variables	**Mean**	**Median**	**SD**	5^{th}%	95^{th}%	**N**
Panel A: Mutual Fund Voting Behavior						
Dependent Variables:						
"For" Vote (ESG proposals)	0.482	0.00	0.500	0.00	1.00	102,226
"For" Vote (E proposals)	0.263	0.00	0.440	0.00	1.00	23,035
"For" Vote (S proposals)	0.238	0.00	0.426	0.00	1.00	22,885
"For" Vote (G proposals)	0.671	1.00	0.480	0.00	1.00	56,305
Main Regressors:						
Fund Effects	-0.16	0.02	6.86	-0.49	0.45	102,226
Panel B: Corporate Violations						
Dependent Variables:						
E&S Violations	0.083	0.00	0.275	0.00	1.00	95,778
E Violations	0.026	0.00	0.160	0.00	1.00	95,778
S Violations	0.065	0.00	0.247	0.00	1.00	95,778
non-E&S Violations						
Main Regressors:						
Funds' ESG Views	0.012	0.037	0.164	-0.227	0.109	95,778
Panel C: Mutual Fund ESG Performance and Returns						
Dependent Variables:						
Portfolio ESG score	2.31	2.34	1.95	-1.00	5.18	23,475
Portfolio E score	0.95	0.93	0.75	0.00	2.09	23,475
Portfolio S score	1.47	1.40	1.46	-0.88	3.84	23,475
Portfolio G score	-0.11	-0.05	0.33	-0.74	0.20	23,475
Portfolio Returns	0.16	0.15	0.29	-0.16	0.49	23,475
Main Regressors:						
Fund Effects (ESG)	0.00	0.00	6.19	-0.49	0.44	23,475
Fund Effects (E)	-0.07	0.00	5.844	-0.15	0.16	23,475
Fund Effects (S)	0.12	0.00	11.825	-0.41	0.38	23,475
Fund Effects (G)	-0.05	0.00	3.439	-0.18	0.17	23,475

Table IA.X. Fund effects and subsequent ESG voting behavior: Robustness check

This table explores the relation between fund fixed effects and subsequent mutual funds' voting behavior. The dependent variable is coded as one if a fund votes in favor ("For") of a given proposal. The main independent variable is the fund-specific effect estimated as in Equation 4. We divide the mutual fund voting sample into two parts around the year 2010. We show the estimations from running regressions of fund effects measured out-of-sample (i.e., in the first half of the mutual fund voting sample – 2002 to 2009) on their ESG voting behaviour over the second part of the sample (2010-2018). We exclude from the sample of voting proposals firms that were already in the portfolio of funds in the period 2002–2009. In addition, we exclude observations pertaining to funds whose t-statistics (in absolute value) of the estimated fixed effects is below the 1st percentile of the distribution across all funds. Firm Controls include size, Tobin's Q, leverage, and ROA. Fund Controls include fund size, expense ratio, turnover, fund flows, fund age, and family size. The coefficients are expressed in percentage. The t-statistics clustered at the firm and fund levels are reported in parentheses.

	ESG		E		S		G	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Investor Effects	1.363**	1.315**	3.690***	3.679***	2.287***	2.294***	0.398***	0.357***
	(2.07)	(2.00)	(3.78)	(3.77)	(6.60)	(6.62)	(2.88)	(2.63)
ISS Recommendation	45.165***	43.413***	26.433***	27.318***	30.289***	32.017***	59.086***	60.061***
	(21.27)	(16.56)	(11.67)	(9.05)	(10.60)	(8.77)	(15.53)	(12.06)
Firm Controls	Y		Y		Y		Y	
Fund Controls	Y	Y	Y	Y	Y	Y	Y	Y
Firm FE	Y		Y		Y		Y	
Time FE	Y		Y		Y		Y	
Firm X Time FE		Y		Y		Y		Y
Observations	101,181	101,170	22,805	22,805	22,652	22,652	55,737	55,727
Adjusted r^2	0.370	0.423	0.172	0.192	0.201	0.217	0.371	0.428

Table IA.XI. Fund effects and subsequent corporate violations

This table explores the relation between fund effects and subsequent environmental and social corporate violations. The dependent variable is the average probability that the company is involved in a corporate violation of each type. To construct our main independent variable, for each firm-date (year-quarter) pairs in our sample, we compute the weighted average of investor effects across all investors that own firm shares in a given quarter, using the investor ownership as weights. We construct the variable *Funds' ESG Views* using fund effects coming from an estimation performed using the mutual fund voting sample for the period 2002–2009. In computing the firm-level weighted average of investor effects, we exclude funds whose t-statistics (in absolute value) of the estimated fixed effects is below the 1st percentile of the distribution across all funds. We then study the impact of these fund effects on the probability of corporate violations over the sample 2010-2018. Moreover, we exclude from the sample firms that were already in the portfolio of funds in the period 2002–2009. We report the results of regressions with firm-level controls, industry-time fixed effects, and firm fixed effects. Firm Controls include size, Tobin's Q, leverage, and ROA. The coefficients are expressed in percentage. The t-statistics clustered at the firm level are reported in parentheses.

	E & S Violations			E Violations			S Violations		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Funds' ESG Views	-1.338***	-1.035***	-0.347***	-0.403***	-0.336***	-0.145***	-1.042***	-0.766***	-0.207***
	(-6.70)	(-5.44)	(-3.79)	(-4.52)	(-3.68)	(-2.97)	(-6.30)	(-4.90)	(-2.99)
Firm Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y
Industry X Time FE		Y	Y		Y	Y		Y	Y
Firm FE			Y			Y			Y
Observations	95,778	95,778	95,778	95,778	95,778	95,778	95,778	95,778	95,778
Adjusted R^2	0.002	0.023	0.357	0.001	0.014	0.271	0.002	0.016	0.299

Table IA.XII. Fund effects and subsequent ESG voting behavior: Placebo analysis

This table explores the relation between mutual fund effects and funds' voting behavior on non-ESG proposals in a placebo test. The dependent variable is coded as one if a fund votes in favor ("For") of a given proposal. The main independent variable is the fund-specific effect estimated as in Equation 4. We divide the mutual fund voting sample into two parts around the year 2010. We show the estimations from running regressions of fund effects measured out-of-sample (i.e., in the first half of the mutual fund voting sample – 2002 to 2009) on their voting behaviour over the second part of the sample (2010-2018). Moreover, we exclude from the sample of voting proposals firms that were already in the portfolio of funds in the period 2002–2009. In this table, we focus on a set of proposals that are unrelated to ESG dimensions and based on management- or shareholder-initiated routine proposals. We exclude observations pertaining to funds whose t-statistics of the estimated fixed effects is below the 1st percentile of the distribution across all funds. Firm Controls include size, Tobin's Q, leverage, and ROA. Fund controls include fund size, expense ratio, turnover, fund flows, fund age, and family size. The coefficients are expressed in percentage. The t-statistics clustered at the firm level are reported in parentheses.

	All Routine Proposals		Management-Initiated		Shareholder-Initiated	
	(1)	(2)	(3)	(4)	(5)	(6)
Fund Effects	0.010	0.008	0.005	0.005	0.036	0.041
	(1.17)	(0.82)	(0.79)	(0.75)	(0.54)	(0.62)
ISS Recommendation	67.361***	68.519***	66.683***	66.856***	31.751***	43.575***
	(49.62)	(46.66)	(40.28)	(37.23)	(8.87)	(4.37)
Firm Controls	Y		Y		Y	
Fund Controls	Y	Y	Y	Y	Y	Y
Firm FE	Y		Y		Y	
Time FE	Y		Y		Y	
Firm x Time FE		Y		Y		Y
Observations	675,117	673,337	650,005	648,216	25,102	25,099
Adjusted r^2	0.391	0.448	0.405	0.448	0.212	0.242

Table IA.XIII. Fund effects and subsequent corporate violations: Placebo analysis

This table explores the relation between mutual fund effects and corporate violations. The dependent variable is the average probability that the company is involved in a corporate violation of each type. To construct our main independent variable (*Investors' ESG Views*), for each firm-date (year-quarter) pairs in our sample, we compute the weighted average of investor effects across all investors that own firm shares in a given quarter, using investor ownership as weights. Investor effects are estimated following Equation 4 for the first part of mutual fund voting sample (2002 to 2009), as in the last column of Panel A in Table IA.IV. In computing the firm-level weighted average of investor effects, we exclude funds whose t-statistics of the estimated fixed effects are below the 1st percentile of the distribution across all funds. In this table, we focus on a set of violations that are unrelated to either E or S dimensions, but relate to tax, insurance, or insider trading violations. The coefficients are expressed in percentage. Firm Controls include size, Tobin's Q, leverage, and ROA. The t-statistics clustered at the firm level are reported in parentheses.

		ESG	
	(1)	(2)	(3)
Funds' ESG Views	-0.069	-0.412	0.032
	(-0.20)	(-1.01)	(0.21)
Firm Controls	Y	Y	Y
Industry X Time FE		Y	Y
Firm FE			Y
Observations	95,753	95,753	95,724
Adjusted R^2	0.044	0.049	0.326

Table IA.XIV. Active vs. passive fund effects and subsequent ESG performance

This table explores the relation between fund effects and out-of-sample ESG performance by segregating active mutual funds (Panel A) and passive mutual funds (Panel B). We first compute the fund fixed effects as in Equation 4 (see the last column of Panel A in Tables IA.IV and IA.V) using the mutual fund-manager-firm panel for a sample ending in 2009. We next compute weighted average ESG scores for each fund using the new portfolio investments they initiate after 2010, where each new firm investment is weighted by the proportion of fund's total net asset invested in each year. Finally, we estimate the relationship between the estimated out-of-sample (before 2010) fund effects and the average ESG scores in the subsequent period (2010-2018). We report the results using both the aggregate ESG performance and its three E, S, and G sub-scores. The robust t-statistics are reported in parentheses.

Panel A: Active Mutual Funds								
	ESG		Environmental (E)		Social (S)		Governance (G)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Fund Effects	0.0069	0.0054	0.0188**	0.0196**	0.0238**	0.0242**	0.0017	0.0009
	(1.32)	(1.10)	(2.16)	(2.36)	(2.11)	(2.41)	(1.63)	(1.24)
Fund Controls	Y	Y	Y	Y	Y	Y	Y	Y
Year FE		Y		Y		Y		Y
Observations	13,469	13,469	13,469	13,469	13,469	13,469	13,469	13,469
Adj. R^2	0.032	0.140	0.031	0.123	0.027	0.232	0.000	0.433

Panel B: Passive Mutual Funds								
	ESG		Environmental (E)		Social (S)		Governance (G)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Fund Effects	0.0011	0.0011	-0.0015	-0.0011	0.0001	0.0003	0.0007	0.0010
	(0.46)	(0.53)	(-1.45)	(-1.16)	(0.07)	(0.41)	(0.54)	(0.96)
Fund Controls	Y	Y	Y	Y	Y	Y	Y	Y
Year FE		Y		Y		Y		Y
Observations	185	185	185	185	185	185	185	185
Adj. R^2	0.000	0.169	0.001	0.188	0.000	0.365	0.000	0.245

Table IA.XV. Fund effects and subsequent portfolio returns

This table examines the relation between fund effects and out-of-sample returns for our sample mutual funds' portfolio holdings. We first compute the fund fixed effects as in Equation 4 (see the last column of Panel A in Tables IA.IV and IA.V.) using the mutual fund-manager-firm panel for a sample ending in 2009. We next compute weighted average returns for each fund using the portfolio investments they hold after 2010, where each firm's annual return is weighted by the proportion of fund's total net asset invested in that firm. Finally, we run the regression between the estimated out-of-sample (before 2010) fund effects and the annual portfolio returns in the subsequent period (2010-2018). The coefficients are expressed in percentage. We report the results using both the aggregate ESG performance and its three E, S, and G sub-scores. The t-statistics clustered at the firm level are reported in parentheses.

	ESG		Environmental (E)		Social (S)		Governance (G)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Fund Effects	-0.0032	-0.0015	0.0026	0.0012	-0.0023	-0.0008	-0.0019	-0.0019
	(-0.48)	(-0.18)	(0.37)	(0.15)	(-0.35)	(-0.10)	(-0.23)	(-0.24)
Fund Controls	Y	Y	Y	Y	Y	Y	Y	Y
Year FE		Y		Y		Y		Y
Observations	13,755	13,755	13,755	13,755	13,755	13,755	13,755	13,755
Adj. R^2	0.002	0.150	0.000	0.150	0.000	0.150	0.003	0.150