ecgi

Institutional Investors and ESG Preferences

Law Working Paper N° 631/2022
March 2022

Florencio Lopez de Silanes
SKEMA Business School and NBER

Joseph A. McCahery
Tilburg University and ECGI

Paul C. Pudschedl
Tilburg University

ECGI Working Paper Series in Law

Institutional Investors and ESG Preferences

Working Paper N° 631/2022

March 2022

Florencio Lopez de Silanes
Joseph A. McCahery
Paul C. Pudschedl

Abstract

We study the effect of environmental, social and governance (ESG) scores on the portfolio allocations of institutional investors. Using a unique data set, we find that institutional investor holdings (as measured by 13F filings) are strongly driven by the ESG quality of companies. While investors are driven to add high quality ESG companies to their portfolios, there is a negative relationship to ESG when it comes to taking large ownership stakes. Blockholders appear much less motivated by ESG scores. Evaluating individual ESG scores, we find that the individual ESG governance score has the highest impact on institutional investor holdings.

Keywords: ESG, Sustainable Finance, Institutional Investors, Financial Performance, Disclosure

JEL Classifications: G12, G14, G15, G23, G32, M1

Florencio Lopez de Silanes
Professor of Finance
SKEMA Business School
60 Rue Dostoievski
Sophia Antipolis, 06902, France
phone: +33 493 953 201
e-mail: florencio.lopezdesilanes@skema.edu

Joseph A. McCahery*
Professor of Law
Tilburg University, Tilburg Law School
Prof. Cobbenhagenlaan 221
5037 DE Tilburg, Netherlands
phone: +31 13 466 2306
e-mail: J.A.McCahery@Tilburguniversity.edu

Paul C. Pudschedl
External PhD
Tilburg University, Tilburg Law School
Prof. Cobbenhagenlaan 221
5037 DE Tilburg, Netherlands
e-mail: P.C.Pudschedl@tilburguniversity.edu

*Corresponding Author

Institutional Investors and ESG Preferences

Florencio Lopez de Silanes,* Joseph A. McCahery,** and Paul C. Pudschedl***

Abstract:

We study the effect of environmental, social and governance (ESG) scores on the portfolio allocations of institutional investors. Using a unique data set, we find that institutional investor holdings (as measured by 13F filings) are strongly driven by the ESG quality of companies. While investors are driven to add high quality ESG companies to their portfolios, there is a negative relationship to ESG when it comes to taking large ownership stakes. Blockholders appear much less motivated by ESG scores. Evaluating individual ESG scores, we find that the individual ESG governance score has the highest impact on institutional investor holdings.

Keywords: ESG, Sustainable Finance, Institutional Investors, Financial Performance, Disclosure

JEL Classification: G12, G14, G15, G23, G32, M1

*SKEMA Business School and NBER
**Tilburg University, TILEC, and ECGI
***Tilburg University, TILEC, and University of Applied Sciences Wiener Neustadt

1. Introduction

Environment, social and governance (ESG) scores are important for the sustainability investment decisions of institutional investors. According to *Morningstar* (2020), the amount of ESG investments in the United States exceeded USD 20 billion in 2019. Data from the Global Sustainable Investment Alliance (2020) indicate that sustainable investment assets in the US increased from USD 8.7 trillion at start of 2016 to USD 12.0 trillion at the start of 2018. More generally, it is reported, in 2018 alone, the amount of global sustainable assets under management exceeded USD 30 trillion. Existing research has focused on the non-pecuniary component to investor utility functions (e.g., Fama and French, 2007; Riedl and Smeets, 2017; Renneboog et al., 2008a, 2008b) and has left relatively underexplored the influence of ESG scores on financial performance of companies and the ensuing relationship between financial performance, ESG and investor holdings. Moreover, little is known about how investors consider the relative components of ESG in their portfolio decisions.

In this paper, we examine the revealed preferences of institutional investors for ESG investments, which is primarily determined by their holdings in US-listed equities. To the best of our knowledge, this is the first paper to investigate institutional holdings to shed light on the relative preferences of investors across the three ESG dimensions. We develop a unique dataset of SEC 13F and 13D/G filings of institutional investors and blockholders of US equities in order to measure institutional investor interest in companies between 2016 and 2018. We present evidence on the size of the investor stake, ownership dispersion, and the holdings of blockholder investors.

Two opposing views can be distinguished with respect to the impact of a company's ESG ratings on corporate financial performance. The first view holds that the composite ESG score can show the relationship with financial performance. The second view goes further and holds that the composite ESG score and component E, S, and G ratings together can yield an accurate reflection of the impact of ESG on corporate financial performance. The second view leads us to expect that the analysis of the E, S and G subfactors can explain how each of

the three dimensions separately contribute to firm value (Duque-Grisales and Aguilera-Caracuel, 2019 and Gibson et al. 2019) as well as ownership patterns.

In our analyses, we employ ESG rankings from Bloomberg, Sustainalytics, and Robeco/S&P. The Bloomberg ESG ratings are disclosure-based, measuring simply the amount of ESG data that companies disclose (i.e., companies with higher Bloomberg scores merely disclose more ESG data, but Bloomberg does not asses the data for quality). Sustainalytics and Robeco/S&P rank the actual quality of companies based on their ESG data. All three rating agencies provide a composite ESG ranking, as well as component rankings among the three ESG subcategories (E, S, and G). The rationale of such a strategy is to consider general investor preferences for ESG, as well as the relative preferences among the three components of ESG. Our empirical work focuses on the extent to which institutional investor allocations are driven by ESG rather than by financial characteristics of companies which have generally been shown to relate to financial performance (Fama and French, 1996, 2015; Carhart, 1997). We also control for general financial characteristics as well as industry effects in order to mitigate the effect of large index and tracking funds and still find statistically significant results.

We find that institutional investors (as measured by data from 13F filings) are strongly driven by the ESG quality of companies, and particularly the governance dimension, when deciding which companies to add to their portfolios. However, this preference does not translate to considerations of ownership stakes. In fact, we find evidence that larger ownership stakes are negatively correlated with ESG quality. Using 13D/G data, we find that blockholders, in particular, seem much less motivated by ESG. Our findings generally support the theoretical argument that the vast majority of long-term passive investments of institutional investors are driven disproportionately by ESG over other financial data when simply selecting companies to add to a portfolio, whereas investors taking large ownership stakes and activist investors are much less concerned with ESG. Conversely, we find that larger ownership stakes are negatively correlated with ESG rankings. We also explore the association between ownership stakes of large investors and corporate carbon emissions.

Next, we examine the relationship between the individual ESG components and financial performance to provide evidence on whether institutional investors are overweighting ESG data due to the potential relationship of these data with financial performance. We find weak but statistically significant evidence that ESG is related to decreased risk. While the evidence is consistent with the prior literature on portfolio optimization benefits of ESG, our findings in this regard do not explain the high preference of institutional investors for companies with high ESG scores when controlling for other financial characteristics. Further, the data indicate that a large proportion of institutional investors are driven by ESG in deciding whether or not to invest in a company and how large of a stake to take in the company.

The evidence suggests that ESG disclosure is more strongly correlated with increased financial performance than quality and the governance component of ESG has a much more robust effect on financial performance than the social and environmental components. Furthermore, we find evidence of a negative relationship between the size of ownership stake and ESG – companies underperforming with respect to ESG are also underperforming financially. Thus, it appears that these companies are potentially attractive to activist investors who are willing to take larger stakes in underperforming companies.

Our study contributes to several strands of the literature. First, we extend a growing body of research focusing on the role of ESG issues for the investment decisions of institutional investors (Barko et al., 2018; Amel-Zadeh and Serafeim, 2017; Eccles et al., 2011; Hanson et al., 2017). There have been relatively few studies addressing the influence of institutional investor ownership on companies' ESG performance. Closer to this study is the work, Dyck et al. (2019), who examine the influence of institutional investor ownership on non-US companies' composite E&S performance over time. However, our paper is the first to account for US institutional investors holdings and specifically how they are influenced by aggregate ESG scores and the individual effects of the ESG component scores. Our findings add further evidence as to the influence of ESG issues on blockholders and the size of the ownership stakes of institutional investors in relation to ESG.

Second, this study contributes to the body of literature examine the effects of ESG disclosure. Prior evidence on value-added role of ESG disclosure has largely been related to the positive

effects on financial performance. Consequently, they rely on examining the extent of the different types of ESG disclosure as opposed to the actual ESG quality of the investment. The results of this study are consistent with the findings that the largest institutional investors are seldom supportive of shareholder proposals related to E&S, as suggested by Griffin (2020) and help shed light by showing that as the size of the ownership stake increases, investors care much less about ESG quality.

Third, our results are related to the literature examining the role of composite ESG scores and individual E, S, and G sub-dimensions on the financial performance of companies around the world. Prior evidence on the influence of ESG scores and the individual effects of the E, S, and G subfactors on financial performance of multinational firms in Latin America can be found in Duque-Grisales and Aguilera-Caracuel (2019). We contribute to these studies by using secondary data, rather than a global index, to study the effects of the individual E, S, and G dimensions on US companies. Additionally, Kotsantonis and Serafeim (2019) illustrate the difficulty in constructing consistent ESG ratings. Gibson et al (2019) attribute differences in ESG ratings subfactors to the legal origins of the countries where ratings providers are based, and Eccles and Stroehle (2018) argue that differences are inherent in the mission and goals of the ratings provider. Our paper contributes to these studies by analyzing ownership and financial performance.

The paper proceeds as follows. Section 2 reviews the ESG investment selection and performance literature. Section 3 introduces the data. Section 4 presents and analyzes the results of the relative preferences of institutional investors among the three dimensions of ESG. Section 5 concludes.

2. Motivation and literature review

This section provides an overview of the existing theoretical and empirical literature, as well as the motivation for this research and the hypothesis development.

The prevailing theory behind investors' consideration of ESG factors involves incorporating ESG as a non-pecuniary component of the utility functions for a subset of market participants (Fama and French, 2007). Departing from the conventional risk-return tradeoff, these investors are willing to simply accept lower risk-adjusted returns in exchange for knowing that their investments have positive ESG qualities (Riedl and Smeets, 2017). This is analogous to how some consumers will pay more for fair-trade coffee that, in all other respects, is identical to non-fair-trade coffee (see, for example, Hainmueller et al., 2015). Part of the utility that these consumers receive is the knowledge that the coffee they are consuming is fair-trade. This suggests that ESG-motivated investors are willing to sacrifice a degree of financial performance in exchange for knowing that their portfolio companies are green, environmentally "sustainable," and "socially responsible." In this new environment, they can signal that they engage in good corporate governance, environmental sustainability, and responsible investing—or some combination of these attributes.

Prior literature on ESG mutual funds and green bonds generally suggests that investors in these instruments have a preference or tastes tor a non-pecuniary component of utility. Renneboog et al. (2008b), for instance, show that ESG mutual funds generate subpar financial performance. Hartzmark and Sussman (2019) find that investment funds tend to flow out of mutual funds with poor ESG credentials and into funds with higher ESG quality. And, Baker et al. (2018) show how investors in green bonds are willing to pay a premium to invest in the bonds simply because they are certified as "green."

More broadly, there is evidence that institutional asset managers are widely incorporating ESG considerations into their portfolio management activities (Barko et al., 2018; Amel-Zadeh and Serafeim, 2017; Eccles et al., 2011; Hanson et al., 2017). Dyck et al. (2019) also link institutional investor ownership in companies to ESG. However, their study considers only the companies' composite E and S scores. Furthermore, by combining the Bloomberg and Sustainalytics scores, they do not differentiate between ESG quality and ESG disclosure characteristics of companies. Other literature focuses on the relationship between the ESG scores and individual E, S, and G subfactors in equal proportion and firm performance (Humphrey et al. 2012; Velte, 2017). Duque-Grisales and Aguilera-Caracuel (2019)

document the influence of composite ESG scores and individual E, S, and G dimensions on the financial performance of multinationals in Latin America.

Despite the evidence that a subset of ESG investors are willing to accept lower returns, another strand of the literature argues that ESG factors can be utilized to construct portfolios that can generate superior risk-adjusted returns (e.g., Sherwood and Pollard, 2018; Bannier et al., 2019 Hanson et al., 2017; Boze et al., 2019; Gibson et al., 2019; and Lopez de Silanes et al., 2019). The effect on financial performance is stronger on decreasing risk than increasing returns (Gibson et al., 2019 and Lopez de Silanes et al., 2019). In this regard, there is evidence that ESG firms are less exposed to extreme downside risk (Shafer and Szado, 2019 and Hoepner et al., 2019). Moreover, the market might expect that firms with higher ESG scores would have lower implied volatility under extreme circumstances, thus impacting the volatility smirks in the options markets for these securities demonstrating lowered perceived tail risk (Shafer and Szado, 2019). There is also evidence that activist funds may be able to identify underperforming companies based on ESG criteria (Barko et al., 2018). It is reasonable to expect that firms with lower ESG scores are more likely to be targets of activist campaigns by institutional investors. Hence, boards must realize this and, would align themselves with investors by adopting effective ESG strategies.

While firms' investments in ESG factors may erode profitability, there appear to be two ways in which such investments can benefit individual firms. One such mechanism involves the cost of capital. If a significant subset of investors is motivated by ESG factors, this can affect the cost of capital of good and bad ESG companies (Heinkel et al., 2001). As investors who care about ESG shun companies with poor ESG quality, fewer investors will be willing to hold stocks in these companies, and, therefore, those who are willing will have to hold more of the outstanding stock, making it more difficult for these investors to diversify away firm-specific risks. Consequently, these investors demand higher risk premia to hold a higher proportion of the outstanding shares, and this increases the cost of capital for such firms. Conversely, companies with good ESG metrics see their shares as more popular with investors regardless of the risk-return characteristics. Thus, this inflates the prices of these securities and lowers the cost of capital for ESG firms that perform well.

On the other hand, it is also possible that firms' investments in ESG may generate positive NPV and contribute to firm profitability. Some investments in ESG may create positive externalities for the firm. For example, firms investing in technological innovations can end up lowering their costs thanks to improved technology that may also be more environmentally friendly. This explains the positive relationship sometimes seen between environmental factors and Tobin's Q (see, for example, Dowell et al., 2000 and Konar and Cohen, 2001). Hence, firms' investments in ESG factors may also generate positive NPV if such investments protect the firm from other risks. For example, investments in environmental sustainability can protect firms from regulatory risk by reducing or eliminating fines for polluting and helping firms to anticipate tougher future environmental regulations (Dasgupta et al., 2001; Dowell et al., 2000; Konar and Cohen, 2001). Firms' investments in social responsibility may similarly help them mitigate litigation risks and corporate scandals.

We now turn to explain the discrepancies between investors accepting subpar returns in exchange for positive ESG ratings, as well as the potential for ESG to have positive impacts on firm value and to be able to serve as screening criteria to create superior-performing portfolios. To do so, we conjecture that a large number of long-term, passive, institutional investors encapsulate ESG as a non-pecuniary function of utility. This, in part, bids up the securities prices of some companies based solely on ESG considerations. At the same time, ESG can be related to the risks to which firms are exposed. This relationship opens up the possibility for ESG factors to be used to construct superior-performing portfolios for some investors whose utility functions do not consider (or at least underweight) ESG considerations. Alternatively, or additionally, some activist investors may use poor ESG performance as a way to identify companies which are also underperforming financially (Barko et al., 2018). Based on the subpar performance of ESG mutual funds, we conjecture that investors prefer strong ESG data to other financial data (i.e., ESG factors are their primary concern, followed by risk-return characteristics). Further, the collective actions of large numbers of institutional investors prioritizing ESG data should result in overvaluing securities relative to financial fundamentals. This leads open the opportunity for activist investors to take larger stakes in companies which underperform with respect to ESG.

3. Data and Measurement

This section describes our dataset construction and provides an overview of the summary statistics of our dataset.

Measuring ESG

In contrast to the previous empirical works discussed above, we construct our data set based on composite ESG as well as the three dimensions of ESG to analyze institutional holdings along with financial performance metrics. Much of the previous empirical literature related to ESG and corporate financial performance focuses on a granular analysis of specific ESG data within one of the dimensions of ESG (E, S, or G). Prior literature related to investment performance of ESG as a whole tend to use data related to ESG mutual funds. Dyck et al (2019) consider the relationship of the E and S dimensions to institutional investor holdings.

In this classification, we follow Duque-Grisales and Aguilera-Caracuel (2019) and Gibson et al. (2019) who analyze ESG as well as each of the three dimensions of ESG and compare these with financial performance data. Additionally, we also consider the relationship to investor holdings.

We obtain data for ESG composite ratings and the component ratings for each dimension – environmental, social, and governance – from three well-known data providers: Bloomberg, Sustainalytics, and Robeco.

The Bloomberg ESG disclosure score and the component scores (environmental, social, and governance) are not quality measures; these ratings measure only the extent of a company's ESG-related data disclosure. It is a Bloomberg proprietary score that ranges from 0.1 for companies that disclose a minimum amount of ESG data to 100 for those that disclose every ESG-related data point collected by Bloomberg. Bloomberg states that "each data point is weighted in terms of importance" and that "the score is also tailored to different industry sectors. In this way, each company is only evaluated in terms of the data that is relevant to its industry sector" (Bloomberg Financial Terminal).

The Sustainalytics ESG quality ranking is “assigned to the company based on its environmental, social and governance (ESG) total score relative to its industry peers” (Bloomberg Financial Terminal). The ranking ranges from 0 for the poorest-ESG-quality companies to 100 for the best. The Sustainalytics ESG ranking is meant to encompass a company's level of preparedness, disclosure and controversy involvement across all three ESG themes. The Sustainalytics component rankings similarly rank companies along each of the three ESG dimensions.

The Robeco Total Sustainability Rank rates companies based on company responses to questionnaires regarding their practices across the three ESG dimensions. RobecoSAM crafts and sends the questionnaires to companies in cooperation with Standard and Poor’s (S&P). RobecoSAM, part of the Robeco group, is “an investment specialist focused exclusively on sustainability investing” (Bloomberg Financial Terminal). Like the Bloomberg and Sustainalytics rankings, the Robeco scores make adjustments by industry. “The types and weights of individual questions and criteria are adjusted for each industry-specific questionnaire to reflect the materiality of specific sustainability themes within each industry” (Bloomberg Financial Terminal).

The Bloomberg ESG disclosure scores measure the amount of ESG data a company reports publicly and does not measure the quality of a company's performance on any data point. However, previous research has shown that part of being a high-quality ESG company is the transparency and disclosure of ESG quality. In a previous paper, we established that, given the largely voluntary nature of ESG disclosure requirements, as well as the lack of standardization, there exists a strong correlation between ESG disclosure and ESG quality (Lopez de Silanes et al., 2019).

In the context of our research question, the nature of the Bloomberg ESG disclosure score is somewhat more objective and transparent than that of the other two ratings providers, as it does not assign subjective quality judgements to the individual ESG criteria, aside from the relative importance of the data point itself, and not what constitutes a “good” or “bad” quality. On the other hand, the Sustainalytics and Robeco ESG scores, while widely

published and used by industry (as evidenced by its prominence on the Bloomberg Financial Terminal), contain significant value judgements as to what constitutes a company's "good" or "poor" performance with regard to ESG.

ESG data suppliers can be differentiated between value-driven or values-oriented, with only little consolidation and convergence over time (Eccles and Stroehle, 2018). In contrast to the Sustainalytics values-oriented approach, Robeco ESG ratings would be value-driven according to financial performance, and they claim to emphasize the ESG factors most correlated with superior financial results. Indeed, the Robeco index is based largely on the internal proprietary analyses conducted by RobecoSAM, a sustainable investments asset management subsidiary of Robeco, which developed their ESG rankings primarily for internal investment management purposes in addition to publishing ESG rankings (Bloomberg Financial Terminal; Eccles and Stroehle, 2018).

Much of the early research sought to examine correlation or diversion among CSR ratings (Chatterji and Toffel, 2010). For instance, competing environmental ratings are strongly correlated (Delmas et al., 2013). Accounts along the same lines, such as Daines et al. (2010), find little predictive power of corporate governance ratings for performance, but slightly better for ratings based on financial disclosures rather than on qualitative information on corporate governance. Similarly, numerous researchers find that market intermediaries often influence ESG ratings and that changes in firm performance often precede the publication of a ratings change, thus making the rating less useful for investors since it conveys only information already absorbed by market prices (Doh et al., 2010).

More recently, Kotsantonis and Serafeim (2019) illustrate the difficulty in creating a standard and objective framework for reporting and evaluating ESG data metrics. While Eccles and Stroehle (2018) argue that the differences in ratings can be attributable to the "mission" and origins of the rating provider (i.e. "values-oriented" versus "value-driven"), Gibson et al (2019) argue that disagreements among ESG ratings may be attributable to differences in the legal systems of the countries where ratings providers are based. This view, however, overlooks the globalized nature of the ESG ratings market and the cross-country nature of some ratings that are partnerships of rating providers located in different countries (e.g. the

Robeco index is jointly managed by S&P and Robeco). Regardless of the origins of the differences, it is clear that divergence is a poignant issue when comparing ESG ratings data. Furthermore, any subsequent analysis may be highly sensitive to the ESG ratings provider being used. This is our motivation for using three data providers and demonstrating the sensitivity of results to the data provider used.

Dataset construction

This section describes our data collection methodology and our general description and summary of the data.

In constructing our dataset, we screened for US publicly listed companies for which composite and all three component ratings from all three ESG data providers were available for any of the years 2016-2018. Any company-year observation that did not have a complete set of ratings from all three providers was excluded. We also excluded any company-year observation that did not have complete financial information to calculate the control and independent variables used in our analyses.

We then accessed SEC 13F and 13D/G filings data available through the Thomson Reuters Database to match institutional holding and blockholder holding data to each company-year observation. Any investment manager with at least USD 100 million in assets under management is required to file form 13F, listing their equity ownership stakes (17 CFR § 240.13f-1). Additionally, anyone with a beneficial ownership stake of more than 5% of a publicly traded company's equity must file schedule 13D/G (17 CFR § 240.13d-1).

We use the number of 13F filers for a company to represent the number of institutional investors holding shares in that firm and the number of 13D/G filers to represent the number of blockholders. This is also the category into which activist shareholders would fall. We are careful to include the ultimate or beneficial owner of the shares. This way, when an asset manager holds shares in the same company in different funds or managed accounts, we avoid double-counting the number of investors holding the company's shares. For our dataset all

blockholders are also institutional investors who are also subject to file form 13F. We therefore label any institutional investor with a beneficial ownership stake of more than 5% as a "blockholder" for the purpose of our analyses. In order to maintain a scale consistent with that of our other variables, we standardize the number of institutional investors and the number of blockholders using z-scores.

The data obtained from the forms 13F allow us to calculate the percentage of common shares held by institutional investors (all 13F filers) as well as the percentage of common shares owned by blockholders (investors whose stake is at least 5%). These data are also used to calculate ownership concentration, measured by the Herfindahl-Hirschman Index (HHI). The HHI is calculated as the sum of the square of each shareholder's percentage ownership in the firm. The equation for the HHI is

$$\mathrm{HHI}_{i,t} = \sum_{j=1}^{N_{i,t}} s_{i,t,j}^2,$$

where $N_{i,t}$ is the number of shareholders in firm i at time t, and $s_{i,t,j}$ is the percentage ownership in firm i at time t of shareholder j. A higher HHI is a measure of greater concentration of equity holdings in a smaller number of shareholders, while a smaller HHI indicates dispersed shareholding by a larger number of shareholders with smaller stakes.

Table 1 contains full descriptions and definitions of all the variables used in our analyses. Table 2a also provides summary univariate statistics for the variables used in our regressions, and Table 2b shows a correlation matrix of all the variables used in our analyses.

4. Results

We begin our analysis by examining the relative preferences of institutional investors among the three dimensions of ESG. Specifically, we look at how investors allocate their capital among companies by considering financial characteristics as well as ESG criteria. In addition to voice and complete exit, investors have the option to increase and decrease their holdings

in response to the changing financial and ESG characteristics of their portfolio companies. Furthermore, we recognize the importance of voice to institutional investors (McCahery et al, 2016), and hypothesize that among ESG criteria strong governance structures are of paramount importance as governance is the mechanism by which investors can voice their preferences for firm policy while considering long-term value creation as well as social and environmental sustainability goals. Therefore, we expect the governance dimension to be the most important factor of how investors choose portfolio companies.

Across the three data providers we examine, we believe that the Bloomberg ESG disclosure indices are the most relevant. For one, it is the most objective set of ratings as the Bloomberg ratings simply measure how much data along each dimension of ESG a company discloses. Given the difficulty of relying on one particular ESG rating provider, companies that disclose the most data should be most attractive to investors who are interested in these data. Furthermore, we hypothesize that it in the absence of standardized and comparable ESG ratings, investors will prefer the optionality of being able to evaluate company ESG criteria themselves in order to supplement or complement third party ESG ratings. Additionally (or alternatively), in the absence of mandatory ESG disclosure guidelines and objective ESG ratings, investors may view companies which self-disclose high levels of ESG data as a signal of high quality. (We previously found evidence supporting this view in Lopez de Silanes et al, 2019).

Relative emphasis of ESG component rankings

Before we turn our attention to examining the relative impact of ESG components on institutional investor holdings, we recognize the divergence among ESG ratings and the difficulties of objectively measuring ESG (as discussed above). We therefore begin our analysis by looking at how the ratings providers in our sample set weight the three sub-dimensions of ESG and the relative emphasis attached to each component rating in calculating the composite ratings. In order to do this, we regress the three component rankings of each ESG index onto the composite ranking. We use dummy variables to control

for industry and year effects. This is particularly important because each of the ratings providers adjusts its ratings over time and tailors the ratings to each industry.

Table 3 presents the results of the regressions. The Bloomberg and Robeco ratings show a clear emphasis on the environmental dimension and roughly equal weights on the social and governance dimensions. We find that the Bloomberg environmental rating accounts for twice as much as each of the social and governance dimensions in contributing to the composite ESG rating. The Robeco ESG rating places approximately 50% more weight on the environmental dimension as each of the other two dimensions. On the other hand, the Sustainalytics ESG ratings emphasize the environmental and social dimensions equally, while attaching a weight to the governance dimension of about half of that applied to each of the other two dimensions.

The differences we find among the ratings illustrate the importance of, in the absence of a single objective measure for ESG criteria, considering multiple proxies in order to test the robustness of any analyses relying on one set of data concerning ESG (or any component dimension). We therefore continue with our analysis while looking across all three data providers.

Institutional investor holdings and ESG

The next step in our analysis is to distinguish among investor preferences across the three dimensions of ESG. To estimate these preferences, we regress composite ESG ratings from all three rating providers, as well the environmental, social, and governance component scores, onto the number of institutional investors and 5% blockholders. We use z-scores to standardize the number of institutional investors and the number of blockholders in order to use a consistent scale as the other variables in our regressions. We also consider the total percentage of shares held by institutional investors generally and blockholders in particular. We then consider whether the average ownership stake of institutional investors and blockholders is affected by ESG characteristics. Finally, we consider relationships between ESG and the HHI measure of ownership concentration in firms. These tests are designed to

test to what extent investors are drawn to firms based on each component of ESG, and whether and which ESG characteristics affect the relative ownership size of investor stakes.

We use a standard set of control variables. To control for firm size, we use the natural logarithm of the firm's market capitalization. To control for varying degrees of leverage, we use the ratio of total debt to market capitalization. We use Tobin's Q as a control variable for the level of a firm's intangible assets, which previous research has shown to be correlated with a firm's environmental quality scores (see, for example, Dowell et al., 2000 and Konar and Cohen, 2001). Tobin's Q is also highly correlated with the firm's book-to-market ratio, which is a widely quoted financial metric and found to be related to financial performance (Fama and French, 1996, 2015; Carhart, 1997). We use return on assets as a measure of a firm's long-term profitability and CAPM beta to measure a firm's exposure to systemic risk (Sharpe, 1964; Lintner, 1965). We use dummy variables to control for industry-level and year effects. For details of the definitions and calculations of all variables, see Table 1.

Table 4 shows the result of our regressions where the dependent variable is the standardized number of 13F filers, and Table 5 shows the regressions repeated where the standardized number of blockholders is the dependent variable. Table 6 uses ownership concentration as the dependent variable. Table 7 and Table 8 examine the relationship between ESG and total institutional and blockholder ownership respectively. And Table 9 and Table 10 show regressions on the average ownership stake of institutional investors and blockholders.

Table 4 presents the results of our regressions on the total number of institutional investors and ESG scores. The most important finding is that, with the exception of the Robeco ratings, investors have a significant preference for firms with strong ESG rankings. We conjecture that the coefficients on the composite rankings should relate to institutional investors' relative preferences for the three dimensions of ESG. For the composite rankings, the Bloomberg ESG scores are more strongly correlated with holdings than are the Sustainalytics ratings. The non-significant finding of the Robeco ratings implies no correlation between these ratings and institutional investors' holdings.

The fact that Bloomberg disclosure scores have the strongest relation to holdings may indicate that investors prefer holding companies with strong ESG disclosure records. There may be several possible explanations for this result. First, since the Sustainalytics score also shows statistical significance, it may be the case that, second to ESG disclosure scores, investors prefer companies with high values-oriented qualities. Second, this supposition is reflected in the Sustainalytics rankings, as opposed to the more value-based ratings of Robeco, for which we find no statistically significant relation to holdings (see Eccles and Stroehle (2018) on the values-oriented versus value-based approach of ratings providers). Thus, the results are consistent with the relatively low impact of the financial metrics in our regressions on holdings data.

We compare next the coefficients on the component ratings in order to estimate the relative preferences of institutional investors among the three dimensions of ESG. First, for both the Bloomberg and Sustainalytics ratings, the highest impact on holdings is from the governance dimension. The coefficient on the Bloomberg governance rating is approximately twice that of the Bloomberg environment rating, while the coefficient of the social rating lacks statistical significance. Second, the coefficient on the Sustainalytics governance rating is slightly higher than that of the Sustainalytics social rating, which, in turn, is slightly higher than that of the Sustainalytics environment rating. Moreover, given the close range of the values of the coefficients on the Sustainalytics component ratings and the similar magnitudes of the standard deviations, one cannot clearly conclude that there is a relative preference among the ESG dimensions. Thus, the results from the Bloomberg ratings are quite clear – investors strongly prefer companies with high disclosure of governance data, followed by environmental data, and they appear indifferent to disclosure of social data.

We find a strong relationship between institutional holdings and a firm's combined environmental, social and governance ratings. This is consistent with the findings of Dyck et al. (2019), but our analysis extends beyond the E and S dimensions of ESG. Furthermore, our result regarding the overwhelming importance of G to institutional investors is not inconsistent with the premise of Dyck et al (2019) that institutional ownership drives E and S increases over time. In fact, our results so far can show that it is through investing in firms

with high governance quality, that investors are able to effectively drive increased E and S performance.

We then proceed further to consider the relative ownership stakes and this relationship with ESG.

Table 5 presents our findings of whether the holdings of blockholders are driven by the component and composite E, S and G ratings. We find that although the regressions on 13D/G filers lack statistical significance, this result suggests there are likely to be differences between institutional investors generally and blockholders involving ESG issues. First, institutional investors generally are more likely to be strongly driven by ESG ratings. Consistent with our expectations, large blockholders and activist investors are less motivated by these ratings. To be sure, there is prior evidence which indicates that some activist investors are driven by ESG and are able to create value by following an ESG-focused strategy (see Barko et al. (2018)). However, it may be that our sample set is not representative of such investors, who may be in the vast minority of activist investors. Alternatively, it may be that such investors tend to rely more on their proprietary collection and evaluation of ESG data and less on the publicly disclosed ESG data and rankings. On the other hand, our results are consistent with Griffin (2020) who finds that the largest institutional investors are rarely supportive of shareholder proposals related to improving a firm's E and S quality, thus supporting the proposition that large investors care much less about ESG.

The regressions in Table 6 on the HHI concentration index also lack statistical significance. This tells us that, while ESG attracts institutional investors to invest in a company, it does not impact the relative size of their investments. Similarly, the analyses in Table 7 and Table 8 show no significant, robust relationships between ESG and the total number of shares owned by either institutional investors generally (Table 7) or blockholders in particular (Table 8).

In Table 9 and Table 10, we regress on the average ownership stake of institutional investors (Table 9) and blockholders (Table 10). While Table 10 shows no convincing evidence that blockholder stakes are related to ESG, Table 9 shows weak, but statistically significant

negative relationships between ESG ratings and the size of the ownership stake taken by institutional investors. Although the effect is weak, it is statistically significant and robust across all ESG composite and component ratings. The evidence here is consistent with our hypothesis that large and activist investors are much less motivated by ESG. The results of our regressions on ownership statistics, and Table 9 in particular, suggest that while institutional investors are strongly motivated to invest in companies with high quality ESG, those investors interested in taking a larger ownership stake are actually demotivated by high ESG scores. This may indicate the efforts of large activist investors identifying companies with poor ESG performance (as described by Barko, et al. 2018), or this may simply be reflective of the phenomenon studied by Griffin (2020) where very large institutional investors fail to support efforts to increase the environmental and social performance of their portfolio companies.

Relationship of ESG with financial performance and systemic risk

We turn next to the effect of ESG factors on financial performance. In this section, we assess the relationship between ESG composite and component scores against several measures of financial performance.

As discussed in Section 2, a factor likely to influence the link between ESG ratings and investor holdings is the degree to which a subsector of investors has a non-pecuniary component of utility (Fama and French, 2007). On the other hand, it may be that these investors are motivated not purely by ESG considerations but also by the possibility that ESG is correlated with firm financial performance. Indeed, the survey literature suggests that most institutional investors consider ESG factors because they believe them to be linked to financial performance (Amel-Zadeh and Serafeim, 2017). It is therefore important that we understand how each component dimension of ESG correlates with financial performance.

One possibility is that company investments in ESG criteria may have positive externalities affecting financial performance, or, conversely, investments with a pure profit motivation may have positive ESG-related externalities. An example of the first case would be if a firm

invests in energy-saving technologies to reduce its carbon footprint, and this creates a positive externality of lowering the firm's energy costs. In the second case, it is possible, and perhaps even more likely, that a firm may invest in green technologies with the purely financial motive of reducing costs, but the investment may coincidentally improve its environmental rating. Investors can recognize such effects and see ESG characteristics as proxies for gauging a firm's financial prospects. Dowell et al. (2000) argue that investors see positive environmental performance as a sign of a high-quality company. Evidence also suggests that firms with better environmental performance have higher intangible-asset valuations, which may indicate positive technological spillover from green investments (Konar and Cohen, 2001).

Another possible link between ESG and firm financial performance may be the combined effects of a sufficiently large number of investors acting on non-financial motives to slant their portfolios towards firms with strong ESG criteria and away from firms with poorer ESG quality. While these investors are motivated, at least in part, by non-financial factors, if a sufficiently large number of investors act in a similar fashion, there will be fewer investors willing to hold poor-quality ESG firms. As a result, it will be harder to diversify the risk of holding these poor-quality ESG firms, and those remaining investors willing to hold these firms' securities will demand higher risk premia to compensate them for reduced diversification possibilities. The subset of investors acting this way needs to be just large enough to raise the cost of capital for firms with poor ESG quality in order to provide a financial incentive to invest in improving ESG quality and, thus, to attract a larger number of investors (see Heinkel et al., 2001).

A third explanation for a positive relationship between ESG and financial performance involves considering the risk benefits that may accrue to individual firms due to their ESG characteristics, as well as the diversification benefits related to firm ESG characteristics. This would explain the results of some strands of the literature that argue for the need to consider the financial performance impacts of ESG factors at the portfolio level. Some of this literature argues that portfolio performance depends on how ESG is used in constructing an investment portfolio (Statman and Glushkov, 2008). These studies find that improved financial performance depends on how the portfolio manager uses ESG screenings. Barnett

and Salomon (2006), for example, find that the link between performance and ESG depends on how a fund manager applies ESG criteria; they also find that positive returns depend on using ESG considerations to weight portfolios away from poor-quality ESG companies rather than using ESG as an absolute screening method to completely exclude them. Sherwood and Pollard (2018) and Hanson et al. (2017) argue that ESG can be used to diversify risks in portfolio construction. Consistent with that view, Barnett and Salomon (2006), Shafer and Szado (2019), and Hanson et al. (2017) find evidence that ESG can be important in managing tail risks. Hoepner et al. (2019) and Bialkowski and Starks (2016) also find some evidence that ESG factors are negatively related to extreme downside risks. This is also consistent with the evidence from Gisbon et al. (2019) and Lopez de Silanes et al. (2019) showing that the relationship between ESG and financial performance is primarily attributable to decreased risk of securities with high ESG scores.

What explains the relevance of ESG factors to a company's risk exposure? A company may invest in lowering its carbon footprint and improving its environmental impact as a way to avoid environmental fines and regulations in the present. However, by investing to improve its environment credentials even further, the company is also hedging against the possibility of more stringent future environmental regulations. In the same vein, similar to the relationship between a firm's environmental quality and performance, a firm may be able to generate positive financial returns, or at least hedge against potential risks, by investing in improving "social" criteria. Doing so would help the firm avoid or limit the risk of controversy and poor publicity (i.e., reputational risk), as well as litigation risk related to negative "social" behavior, such as discriminatory employment practices, health and safety violations, and labor law violations. Similarly, a firm's investments in better corporate governance structures and mechanisms may enhance its financial performance by reducing the risks of agency problems and rent-seeking behavior by management, as well as the possibility of corporate fraud and other scandals, through improved firm governance and oversight.

In order to tease out these multiple effects on financial performance, we test the relationship between ESG composite and component scores against several measures of financial performance. In Table 11, we examine total risk-adjusted returns (assuming reinvested

dividends). Table 12 examines security risk as measured by volatility, and Table 13 considers exposure to systemic risk, as measured by CAPM beta.

For all regressions, we use the following independent variables: to control for size, we use the natural logarithm of the firm's market capitalization; to control for varying degrees of leverage, we use the ratio of total debt to market capitalization. We use Tobin's Q as a control variable for the level of a firm's intangible assets, which previous research has shown to be correlated with a firm's environmental quality scores (see, for example, Dowell et al., 2000; and Konar and Cohen, 2001). This relationship between intangible assets and environmental quality is due, in part, to firms in certain industries (e.g., internet companies) incidentally having a lower carbon footprint because of the nature of their operations. Furthermore, firms that invest in more-efficient technologies often develop technologies that are not only more cost-effective, but that also have smaller carbon footprints. We use dummy variables to control for industry-level and year effects. This is particularly important, as ESG ratings are adjusted periodically and adapted for each industry. The regressions on total returns in Table 11 additionally include volatility as a control variable, so we are, in effect, examining risk-adjusted returns. For details of the definitions and calculations of all variables, see Table 1.

The regression results on risk-adjusted returns in Table 11 show positive relationships between risk-adjusted returns and Bloomberg ESG disclosure composite ratings as well as the environmental and social composite ratings. Interestingly, there is no such evidence for governance ratings. Recall that Table 4 shows that the governance rating has, by far, the greatest impact on institutional ownership. Consequently, an alternative interpretation is that many investors overweight this factor, which essentially overvalues securities with high governance scores and removes any statistically significant relationship with returns when we control for other fundamental financial factors.

Table 11 provides the results that the Bloomberg ESG ratings are the only ones having a statistically significant connection with returns, possibly because the Bloomberg ratings measure only the amount of information disclosed along each ESG dimension and not the ESG quality. While there is likely a strong connection between the extent and the quality of

the disclosed information, the delay before the information is reflected in the ratings of the other providers allows for market information to already be absorbed. It is also possible that the Bloomberg ratings are most significantly related to institutional ownership because they are the most closely related to returns and, as the following tables illustrate, have the strongest relationship with financial performance characteristics generally.

Next, we focus on the relationship between ESG ratings and volatility. Table 12 shows a compelling negative relationship between ESG and risk, as measured by annual volatility. Similar to the results on returns, we find that the strongest relationship is with the Bloomberg disclosure scores, perhaps because of these ratings measure of information content and the relative objectivity of these ratings. It could also be that the companies that disclose more ESG data, as measured by the Bloomberg ratings, happen to disclose more information generally, and this provides investors with more information and helps to minimize price volatility (see Lopez de Silanes et al., 2019).

Looking at the relationship of the composite and component ratings with volatility, we observe that it is strongest for the governance criteria as measured by Bloomberg. This is consistent with what we have shown is strong investor demand for companies with high governance scores. The weakest relationships tend to be on the social and environmental component scores. The reason may be that a lot of environmental- and social-related characteristics are correlated with other control variables in much the same way that environmental scores are correlated with Tobin's Q (as established by Dowell et al, 2000 and Konar and Cohen, 2001).

Table 13 considers whether there is a correlation between ESG and general market risk or systemic risk, as measured by CAPM beta. The results are generally similar to those of Table 11 and 12. The main point that we want to establish here is that there is strong evidence of a statistically significant negative relationship between ESG and systemic risk. This suggests that firms with high ESG quality characteristics are less exposed to systemic risk. However, as before, we caution that the strongest relationship is with the Bloomberg ESG disclosure score, so, again, it may simply be that disclosing a lot of data generally is associated with decreased exposure to systemic risk. Furthermore, the correlation with the governance

dimension across all data providers is consistent and statistically significant. Our analysis here again demonstrates the importance of considering several ESG ratings and looking across composite and component scores. The fact that the Bloomberg ratings are most statistically significant across all components indicates that it likely ESG disclosure that is the most important impact on financial performance. The robustness of the relationship between governance and financial performance across all ratings, supports the evidence we have found related to investor holdings, that governance is the most significant of the ESG dimensions.

In general, our results on the connections between ESG and financial performance in Tables 11, 12, and 13 support the portfolio-optimization strand of the literature, which argues that ESG filters can help to construct a portfolio with superior financial performance (Sherwood and Pollard, 2018; Bannier et al., 2019 Hanson et al., 2017; and Boze et al., 2019).

Furthermore, our evidence suggests that the effect seems to be most pronounced on the risk side – volatility and beta – and this is consistent with the literature suggesting that ESG is a hedge against extreme events. As Hoepner et al. (2019) show, ESG investing helps limit downside risk in extreme situations. Similarly, Shafer and Szado (2019) show, by analyzing volatility surfaces, that options markets price with a lower probability that firms with better ESG quality are exposed to "left-tail" events and extreme downside risk. This is likely because firms' investments in ESG can provide a "hedge" against regulatory risk (more-stringent standards help prevent future environmental and health and safety issues); litigation risk (by having a more diverse workforce and better governance oversight); reputational risk (thanks to an enhanced public image through supporting environmental and social sustainability causes); and the risk of corporate scandals (strong corporate governance mechanisms in place can help to deter and catch fraud and malfeasance).

An interesting question remains about whether there is a relation between corporate carbon emissions and large shareholders. From a policy standpoint, this question is important whether institutional investors' ownership can affect the carbon emissions of investee companies. There are a number of reasons why we may expect a different effect for large shareholders. One possibility is that the holdings of large investors might, indirectly,

influenced firms' efforts to reduce carbon emissions (Gianfrante et al., 2021). Another reason that we might expect to see holdings related to carbon emissions is that if investors hold a significant ownership stake, it may be possible that they can reduce the carbon emissions of investee companies (Azar et al., 2021). The results, presented in Table 14, show that there is no evidence of a statistically significant connection between carbon emissions and large shareholders. The results may be explained by the limited ability of large shareholders' ownership stakes to influence the carbon emissions of their investee companies (Gianfrante et al., 2021). Our findings are in line with our predictions about the relationship between blockholder stakes and ESG.

Finally, the evidence in this section highlights the relationship with financial performance and in part explains the large ESG-driven nature of institutional holdings, despite the fact that governance is the most significant sub-dimension when analyzing holdings and financial performance and that ESG disclosure is generally more significant than ESG quality. While a large number of these investors appear to be driven by non-financial, ESG considerations, the situation can clearly arise in which these investors overinflate the price of securities with high ESG characteristics. This lowers the firms' cost of capital (Heinkel et al., 2001) but can contribute to an unsustainable bubble if it is detached from financial performance considerations. This would especially be the case if investors' preferences for ESG characteristics is cyclical and income-elastic (as suggested by Bansal et al. 2018, who argue that ESG investing is a luxury good and that investor demand for ESG is dependent on disposable income levels), then the shares of such companies are particularly exposed to devaluation in the case of a recession. On the other hand, the fact that ownership stake is negatively correlated with ESG criteria (as illustrated by Table 10) leads support to the argument that activist investors may seek out companies with poor ESG criteria as a way to find companies who are also underperforming financially (Barko, et al., 2018). This, too, is consistent with the empirical findings of Griffin (2020).

5. Conclusion

In this paper, we examine the financial and non-pecuniary, ESG preferences of institutional investors. Using a unique dataset, we focus our analysis on the SEC 13F and 13D/G filings of

institutional investors and blockholders of US equities to test institutional investors' interest in companies. Moreover, we examine the extent to which institutional investors' allocations are driven by ESG versus companies' financial characteristics. The results show that institutional investors have a strong preference for investing in firms with strong ESG rankings relative to other financial metrics and proxies for financial performance. The findings also show that when it comes to the size of the ownership stake the relationship with ESG quality is negative. This study further suggests that high quality ESG companies receive too much attention from institutional investors and are in danger of being overvalued. These results lend support to the claims that activist investors are increasing their stakes in companies with poor ESG performance and large institutional investors are seldom interested in advancing environmental- and social- related shareholder proposals.

We also find that institutional investors have a preference for ESG disclosure over actual ESG quality of portfolio companies. Blockholders on the other hand, appear much less interested in ESG than institutional investors generally. We also find no evidence of a relationship between the holdings of large shareholders and carbon emissions. Upon considering the three dimensions of ESG, we find that governance factors trump social and environmental factors in determining institutional investor interest. Again, company disclosure of governance criteria appears more important than actual governance quality rankings.

Second, we examine the relationship between ESG and financial performance to determine whether institutional investors are, to an extent, overweighting ESG data. We find weak but statistically significant evidence to support the view that ESG is related to decreased risk. Again, ESG disclosure scores are more strongly correlated with decreased risk than actual ESG quality rankings. We also show that the correlation between decreased risk and better governance ratings is stronger than for the social and environmental dimensions of ESG; furthermore, the governance disclosure scores are more strongly correlated than the governance quality rankings. This positive relationship between financial performance and ESG supports the argument that activist investors prefer to find value in companies which are underperforming financially and with respect to ESG; this helps to explain why ownership stake size is negatively correlated with high quality ESG.

Overall, our results support recent evidence of the portfolio-optimization benefits of ESG. We also help to bridge a gap in the literature by showing the relative impact of each of the three subfactors of ESG and clearly distinguishing between the disclosure and quality of ESG. The results of this paper contribute to the literature by shedding light on the ESG preferences of institutional investors.

References

Amel-Zadeh, A. and Serafeim, G. (2017). Why and How Investors Use ESG Information: Evidence from a Global Survey. Financial Analysts Journal, 74(3), 87-103.

Azar, J., Duro, M., Kadach, I., and Ormazabal, G. (2021). The Big Three and Corporate Carbon Emissions Around the World. Journal of Financial Economics, 142, 674-696.

Baker, M.P., Bergstresser, D.B., Serafeim, G., and Wurgler, J.A. (2018). Financing the Response to Climate Change: The Pricing and Ownership of U.S. Green Bonds. Working paper. Available at: http://dx.doi.org/10.2139/ssrn.3275327

Bansal, R. Wu, D., and Yaron, A. (2018). Is Socially Responsible Investing A Luxury Good? Working paper. Available at: http://dx.doi.org/10.2139/ssrn.3259209

Bannier, C.E., Bofinger, Y., and Rock, B. (2019). Doing Safe by Doing Good: ESG Investing and Corporate Social Responsibility in the U.S. and Europe. Centre for Financial Studies Working Paper No 621, available at: https://www.uni-giessen.de/fbz/fb02/fb/professuren/bwl/bannier/team/190424ESGPaper.pdf

Barko, T., Cremers, M., and Renneboog, L. (2018). Shareholder Engagement on Environmental, Social, and Governance Performance. CentER Discussion Paper Series No. 2017-040; European Corporate Governance Institute (ECGI) - Finance Working Paper No. 509/2017; TILEC Discussion Paper No. DP 2017-021. Available at: http://dx.doi.org/10.2139/ssrn.2977219

Barnett, M., and Salomon, R. (2006). Beyond dichotomy: The curvilinear relationship between social responsibility and financial performance. Strategic Management Journal, 27(11), 1101-1122.

Bialkowski, J. and Starks, L.T., (2016). SRI Funds: Investor Demand, Exogenous Shocks and ESG Profiles. University of Canterbury Department of Economics and Finance Working Papers in Economics 16/11, available at: https://ir.canterbury.ac.nz/handle/10092/12492

Bloomberg Financial Terminal, Bloomberg Finance L.P., accessed July 2019.

Boze, B., Krivitski, M., Larcker, D.F., Tayan, B., and Zlotnicka, E. (2019). The Business Case for ESG. Rock Center for Corporate Governance at Stanford University Closer Look Series: Topics, Issues and Controversies in Corporate Governance No. CGRP-77, Available at: https://ssrn.com/abstract=3393082

Carhart, M.M. (1997), On Persistence in Mutual Fund Performance. The Journal of Finance, 52: 57-82.

Chatterji, A., Durand, R., Levine, D., and Touboul, S. (2016). Do ratings of firms converge? implications for managers, investors and strategy researchers. Strategic Management Journal, 37(8), 1597-1614.

Chatterji, A.K. and Toffel, W.W., (2010). How firms respond to being rated. Strategic Management Journal, 31(9), Strategic Management Journal, 31(9), 917-945.

Daines, R., Gow, I., and Larcker, D. (2010). Rating the ratings: How good are commercial governance ratings? Journal of Financial Economics, 98(3), 439-461.

Dasgupta, S., Laplante, B., and Mamingi, N. (2001). Pollution and capital markets in developing countries. Journal of Environmental Economics and Management, 42(3), 310-335.

Delmas, M., Etzion, D., and Nairn-Birch, N. (2013). Triangulating environmental performance: What do corporate social responsibility ratings really capture? Academy of Management Perspectives, 27(3), 255-267.

Doh, J., Howton, S., Howton, S., and Siegel, D. (2010). Does the market respond to an endorsement of social responsibility? the role of institutions, information, and legitimacy. Journal of Management, 36(6), 1461-1485.

Dowell, G., Hart, S., and Yeung, B. (2000). Do corporate global environmental standards create or destroy market value? Management Science, 46(8), 1059-1074.

Duque-Grisales, E. and Aguilera-Caracuel, J. (2019). Environmental, social and governance (ESG) scores and financial performance: moderating effects of geographic international diversification and financial slack. Journal of Business Ethics. Available at: https://doi.org/10.1007/s10551-019-04177-w.

Dyck, A., Lins, K., Roth, L., and Wagner, H. (2019). Do institutional investors drive corporate social responsibility? international evidence. Journal of Financial Economics, 131(3), 693-714.

Eccles, R., Serafeim, G., and Krzus, M. (2011). Market interest in nonfinancial information. Journal of Applied Corporate Finance, 23(4).

Eccles, R.G. and Stroehle, J. (2018). Exploring Social Origins in the Construction of ESG Measures. Working paper. Available at: http://dx.doi.org/10.2139/ssrn.3212685

Fama, E.F., and French, K.R. (2007). Disagreement, tastes, and asset prices, Journal of Financial Economics 83, 667-689.

Fama, E.F., and French, K.R. (2015). A five-factor asset pricing model. Journal of Financial Economics 116(1), 1-22.

Fama, E.F. and French, K.R. (1996). Multifactor Explanations of Asset Pricing Anomalies. The Journal of Finance 51, 55-84.

Gianfrate, G., Kievid, T., and Nunari, A. (2021). Institutional Investors and Corporate Carbon Footprint: Global Evidence. Available at: https://risk.edhec.edu/publications/institutional-investors-and-corporate-carbon

Gibson, R., Glossner, S., Krueger, P., Matos, P., and Steffen, T. (2019). Responsible Institutional Investing Around the World. Swiss Finance Institute Research Paper No. 20-13. Available at: http://dx.doi.org/10.2139/ssrn.3525530

Griffin, C. (2020). Environmental & Social Voting at Index Funds. Working paper. Available at http://dx.doi.org/10.2139/ssrn.3542081

Hainmueller, J., Hiscox, M., and Sequeira, S. (2015). Consumer demand for fair trade: Evidence from a multistore field experiment. Review of Economics and Statistics, 97(2), 242-256.

Hanson, D., Lyons, T., Bender, J., Bertocci, B., and Lamy, B. (2017). Analysts' Roundtable on Integrating ESG into Investment Decision-Making. Journal of Applied Corporate Finance, 29: 44-55.

Hartzmark, S.M. and Sussman, A.B. (2019), Do Investors Value Sustainability? A Natural Experiment Examining Ranking and Fund Flows. The Journal of Finance, 74: 2789-2837.

Heinkel, R., Kraus, A., and Zechner, J. (2001). The effect of green investment on corporate behavior. Journal of Financial and Quantitative Analysis 36, 431-449.

Hoepner, A.G.F., Oikonomou, I., Sautner, Z., Starks, L.T., and Zhou, X. (2019) ESG Shareholder Engagement and Downside Risk; European Corporate Governance Institute – Finance Working Paper No. 671/2020. Available at: http://dx.doi.org/10.2139/ssrn.2874252.

Humphrey, J., Lee, D., and Shen, Y. (2012). The independent effects of environmental, social and governance initiatives on the performance of UK firms. Australian Journal of Management, 37(2), 135-151.

Konar, S., and Cohen, M. (2001). Does the market value environmental performance? The Review of Economics and Statistics, 83(2), 281-289.

Kotsantonis, S., and Serafeim, G. (2019). Four Things No One Will Tell You About ESG Data. Journal of Applied Corporate Finance, 31(2), 50-58.

Lintner, J. (1965). The Valuation of Risk Assets and the Selection of Risky Investments in Stock Portfolios and Capital Budgets. The Review of Economics and Statistics, 47(1), 13-37.

Lopez de Silanes, F., McCahery, J.A., and Pudschedl, P.C. (2019). ESG Performance and Disclosure: A Cross-Country Analysis. TILEC Discussion Paper No. DP2019-032; European

Corporate Governance Institute - Law Working Paper No. 481/2019; Singapore Journal of Legal Studies, March 2020, 217-241. Available at: http://dx.doi.org/10.2139/ssrn.3506084

McCahery, J.A., Sautner, Z., and Starks, L.T. (2016). Behind the Scenes: The Corporate Governance Preferences of Institutional Investors. The Journal of Finance, 71, 2905-2932.

Morningstar (2020). Sustainable Fund Flows in 2019 Smash Previous Records. 10 January 2020. Available at: https://www.morningstar.com/articles/961765/sustainable-fund-flows-in-2019-smash-previous-records.

Renneboog, L., Ter Horst, J., and Zhang, C. (2008). Socially responsible investments: Institutional aspects, performance, and investor behavior, Journal of Banking and Finance 32, 1723-1742.

Renneboog, L., Ter Horst, J., and Zhang, C. (2008). The price of ethics and stakeholder governance: The performance of socially responsible mutual funds, Journal of Corporate Finance 14 (3), 302-322

Riedl, A. and Smeets, P. (2017) Why do investors hold socially responsible mutual funds? Journal of Finance 72, 2505-2550.

Shafer, M. and Szado, E. (2019). Environmental, social, and governance practices and perceived tail risk. Accounting and Finance.

Sharpe, W.F. (1964), Capital Asset Prices: A Theory of Market Equilibrium Under Conditions of Risk. The Journal of Finance, 19: 425-442.

Sherwood, M.W. and Pollard, J.L. (2018). The risk-adjusted return potential of integrating ESG strategies into emerging market equities. Journal of Sustainable Finance and Investment, 8:1, 26-44.

Statman, M. and D. Glushkov, 2009, The wages of social responsibility, Financial Analysts Journal 65: 33-46.

United States Code of Federal Regulations (CFR), Title 17, § 240.13f-1 and § 240.13d-1.

Velte, P. (2017), Does ESG performance have an impact on financial performance? Evidence from Germany, Journal of Global Responsibility 8:2, 169-178.

Appendix

Table 1 – variable definitions

This table provides definitions of the variables used in our data analyses.

Variable	Definition
annualized total returns	This is the annual total return of the company's primary security over the previous calendar year assuming reinvested dividends. Bloomberg field: "CUST_TRR_RETURN_ANNUALIZED"
BBG_ESG	This is a proprietary Bloomberg score based on the extent of a company's publicly disclosed ESG data. Scores range from 0.1 for companies that disclose a minimum amount of ESG data to 100 for those that disclose every data point collected by Bloomberg. Bloomberg tailors the scoring to different industries. In this way, each company is only evaluated in terms of the data that is relevant to its industry sector. This score measures the amount of ESG data a company reports publicly and does not measure the company's performance on any data point. Bloomberg field: "ESG_DISCLOSURE_SCORE"
BBG_environ	This is a proprietary Bloomberg score based on the extent of a company's environmental disclosure as part of ESG data. The score ranges from 0.1 for companies that disclose a minimum amount of ESG data related to the environment to 100 for those that disclose every data point collected by Bloomberg related to the environmental component of ESG. Bloomberg tailors the score to particular industries. In this way, each company is only evaluated in terms of the data that is relevant to its industry sector. This score measures the amount of environmental data a company reports publicly and does not measure the company's performance on any data point. Bloomberg field: "ENVIRON_DISCLOSURE_SCORE"
BBG_social	This is a proprietary Bloomberg score based on the extent of a company's social disclosure as part of ESG data. The score ranges from 0.1 for companies that disclose a minimum amount of ESG data related to the social

	component of ESG to 100 for those that disclose every data point collected by Bloomberg related to social factors of ESG. Bloomberg tailors the score to particular industries. In this way, each company is only evaluated in terms of the data that is relevant to its industry sector. This score measures the amount of social data a company reports publicly and does not measure the company's performance on any data point. Bloomberg field: "SOCIAL_DISCLOSURE_SCORE"
BBG_govn	This is a proprietary Bloomberg score based on the extent of a company's governance disclosure as part of ESG data. The score ranges from 0.1 for companies that disclose a minimum amount of ESG data related to governance to 100 for those that disclose every data point collected by Bloomberg related to the governance component of ESG. Bloomberg tailors the score to particular industries. In this way, each company is only evaluated in terms of the data that is relevant to its industry sector. This score measures the amount of governance data a company reports publicly and does not measure the company's performance on any data point. Bloomberg field: "GOVNCE_DISCLOSURE_SCORE"
Beta	Beta measures the percentage price change of the security given a one percent change in a representative market index - here the S&P 500 index is used. The beta value is determined by comparing the price movements of the security and the S&P 500 index for the past two years of weekly data. Bloomberg field: "EQY_RAW_BETA"
Blockholders	This is the number of 13D/G filers who have a beneficial ownership of at least 5% of a security. The ultimate beneficial owner is used in order to avoid double counting in such cases when a security is held in multiple separate accounts. This value is standardized using a z-score transformation where each observation is transformed to the number of standard deviations that value is from the mean (i.e. $z_i = (x_i - \mu)/\sigma$; where μ is the mean and σ is the standard deviation).
blockholder_ownership	This value represents the percentage of a company's shares which are owned by blockholders.
blockholder_average_stake	This represents the average ownership stake (in percentage terms) in a company by blockholders. It is calculated as: blockholder_ownership / blockholders. For companies with no blockholders, this value is assigned 0.
institutional_investors	This represents the number of 13F filers who disclose ownership of a company's common stock. An asset manager with at least USD 100 million in assets under

	management is required to disclose the securities it manages. We use asset managers name in order to avoid double counting in cases when one asset manager holds securities in multiple separate accounts or funds. This value is standardized using a z-score transformation where each observation is transformed to the number of standard deviations that value is from the mean (i.e. $z_i = (x_i - \mu)/\sigma$; where μ is the mean and σ is the standard deviation).
institutional_investor_ownership	This is the percentage of a company's shares which are owned by institutional investors.
institutional_investor_avg_stake	This is the average size (in percentage terms) of the ownership stake by institutional investors in the company. It is calculated as: institutional_investor_ownership / institutional investors).
log_mktcap	We use the natural logarithm of a company's market capitalization in order to control for relative size in our analyses. This corresponds to the natural logarithm of the Bloomberg field "HISTORICAL_MARKET_CAP".
ownership_concentration (HHI)	Data from forms 13F are used to calculate ownership concentration, measured by the Herfindahl-Hirschman Index (HHI). The HHI is calculated as the sum of the square of each shareholder's percentage ownership in the firm. The equation for the HHI is $\mathrm{HHI}_{i,t} = \sum_{j=1}^{N_{i,t}} s_{i,t,j}^2,$ where $N_{i,t}$ is the number of shareholders in firm i at time t, and $s_{i,t,j}$ is the percentage ownership in firm i at time t of shareholder j.
ROA	As a control variable for company profitability, we use return on total assets. ROA is calculated as: (Trailing 12M Net Income / Average Total Assets) * 100. Bloomberg field: "RETURN_ON_ASSET"
Robeco_ESG	This is a company's total sustainability score based on the RobecoSAM Corporate Sustainability Assessment. This aggregate score is based on all question scores and ranges from 0 to 100. The types and weights of individual questions and criteria are adjusted for each industry-specific questionnaire to reflect the materiality of specific sustainability themes within each industry. Bloomberg field: "ROBECOSAM_TOTAL_STBLY_RANK"
Robeco_environ	This is a company's environmental sustainability score based on the RobecoSAM Corporate Sustainability

	Assessment. This score is based on the company's scores within the environmental dimension of the RobecoSAM Corporate Sustainability Assessment; it ranges from 0 to 100. The types and weights of questions and criteria are adjusted for each industry-specific questionnaire to reflect the materiality of specific environmental sustainability themes within each industry. Bloomberg field: "ROBECOSAM_ENV_DIMENSION_RANK"
Robeco_social	This is a company's social dimension score based on the RobecoSAM Corporate Sustainability Assessment. This score based on the company's scores within the social dimension of the RobecoSAM Corporate Sustainability Assessment; it ranges from 0 to 100. The types and weights of individual questions and criteria are adjusted for each industry-specific questionnaire to reflect the materiality of specific social sustainability themes within each industry. Bloomberg field: "ROBECOSAM_SOCIAL_DIMENSION_RANK"
Robeco_govn	This is a company's governance score based on the RobecoSAM Corporate Sustainability Assessment. This score based on the company's scores within the governance dimension of the RobecoSAM Corporate Sustainability Assessment; it ranges from 0 to 100. The types and weights of individual questions and criteria are adjusted for each industry-specific questionnaire to reflect the materiality of specific corporate governance related themes within each industry. Bloomberg field: "ROBECOSAM_ECON_DIMENSION_RANK"
Sustainalytics_ESG	Sustainalytics assigns a rank to the company based on its total ESG quality relative to its industry peers. Scores range from 0 to 100. Aggregate ESG performance encompasses a company's level of preparedness, disclosure and controversy involvement across all three ESG themes. Bloomberg field: "SUSTAINALYTICS_RANK"
Sustainalytics_environ	Sustainalytics assigns a rank for the company's management of its environmental record in relation to industry peers. Scores range from 0 to 100. Environmental performance is determined by the level of environmental preparedness and disclosure in addition to environmental controversies. Bloomberg field: "SUSTAINALYTICS_ENVIRONMENT_PCT"
Sustainalytics_social	Sustainalytics assigns a rank for the company's management of its social impact relative to industry peers. Scores range from 0 to 100. Social performance is determined by the quality of policies, programs and

	management systems concerning employees, suppliers, customers and society in addition to related controversies. Bloomberg field: "SUSTAINALYTICS_SOCIAL_PERCENTILE"
Sustainalytics_govn	Sustainalytics assigns a rank for the company's management of its governance activities in relation to industry peers. Scores range from 0 to 100. Bloomberg field: "SUSTAINALYTICS_GOVERNANCE_PCT"
Tobin_Q	We use Tobin's Q to control for the level of a firm's intangible assets. It is the ratio of the market value of a firm to the replacement cost of the firm's assets. The ratio is computed by Bloomberg as: (Market Cap + Total Liabilities + Preferred Equity + Minority Interest) / Total Assets. Bloomberg field: "TOBIN_Q_RATIO"
totDebt_to_mktcap	In order to control for leverage, we calculate the ratio of firm debt to market capitalization. This corresponds to the quotient of the Bloomberg fields "SHORT_AND_LONG_TERM_DEBT" / "CUR_MKT_CAP".
Volatility	To measure the risk of holding a company's security, we use historical volatility calculated by Bloomberg as the annualized standard deviation of the relative price changes for the daily closing prices over the previous calendar year. Bloomberg field: "VOLATILITY_360D".
Industry	In our regressions, we use industry dummies based on the first digit of the company's primary Standard Industrial Classification (SIC) code. Bloomberg field: "EQY_SIC_CODE".
Log_GHG_emissions	We use the natural log of the total greenhouse gas (GHG) emissions of the company in metric tons. Greenhouse gases are defined as those gases which contribute to the trapping of heat in the Earth's atmosphere and include Carbon Dioxide (CO2), Methane, and Nitrous Oxide. This includes scope 1 and scope 2 emissions. Scope 1 emissions are direct GHG emissions from sources that are owned or operated by the company. Sources include combustion facilities, company owned or operated transportation, and physical or chemical processes. Scope 2 emissions are indirect GHG emissions that are caused by the company through the consumption of imported heat, electricity, cooling, or steam. Bloomberg field: "TOTAL_GHG_CO2_EMISSIONS".

Table 2a – summary statistics

This table shows summary univariate statistics for all variables used in our analyses.

Variable	Mean	Median	S.D.	Min	Max	observations
annualized total returns	16.2	15.4	27.5	-75.8	232	984
BBG_ESG	35.6	34.7	13.4	13.2	71.1	984
BBG_environ	26.7	24.8	18	1.38	73.6	984
BBG_social	31.7	29.8	14.3	3.12	73.4	984
BBG_govn	59.6	58.9	7.14	26.8	85.7	984
beta	1.03	1.02	0.538	-0.531	4.71	984
blockholders	3.04	3	1.2	0	8	984
blockholders (z-score)	0.00149	-0.0392	1.18	-2.98	4.86	984
blockholder_ownership	23.8	23.2	10.4	0	72	984
blockholder_average_stake	7.62	7.51	2.03	0	27	984
institutional_investors	785	612	462	1	2730	984
institutional_investors (z-score)	-0.00102	-0.374	0.999	-1.7	4.2	984
institutional_investor_ownership	78.7	81.1	15.8	0.0268	100	984
institutional_investor_avg_stake	0.132	0.127	0.0734	0.00991	0.757	984
log_mktcap	9.98	9.79	1.04	7.04	13.6	984
ownership_concentration (HHI)	0.0484	0.0397	0.0642	0.0208	0.9989	984
ROA	5.65	5.18	6.8	-30.1	36.8	984
Robeco_ESG	44	41	27.2	0	100	984
Robeco_environ	44.1	41	27.2	0	100	984
Robeco_social	40.3	33	28.1	0	100	984
Robeco_govn	48.8	47	25.1	0	100	984
Sustainalytics_ESG	52.8	54.8	26.1	0	100	984
Sustainalytics_environ	50.6	51.9	28.2	0	100	984
Sustainalytics_social	51	53.5	27	0	100	984
Sustainalytics_govn	56.6	58.2	25	0	100	984
Tobin_Q	2.18	1.77	1.26	0.626	9.98	984
totDebt_to_mktcap	0.396	0.249	0.537	0	5.64	984
volatility	26.2	23.6	10.9	9.2	102	984
log_GHG_emissions	13.522	13.402	2.0862	8.7491	18.668	984

Table 2b – correlation matrix

This table shows Pearson's pair-wise correlation coefficients for all variables used in our analyses. The two-tailed test 5% critical value is 0.0677 for n=984.

	annualized total returns	BBG_ESG	BBG_environ	BBG_social	BBG_govn
annualized total returns	1	0.0553	0.0543	0.0641	0.034
BBG_ESG		1	0.9768	0.8454	0.7684
BBG_environ			1	0.73	0.6984
BBG_social				1	0.6079
BBG_govn					1

	beta	blockholders	blockholder_ownership	blockholder_average_stake	institutional_investors
annualized total returns	0.1241	0.0353	0.0164	-0.0344	0.0838
BBG_ESG	-0.0976	-0.1148	-0.1796	-0.178	0.3896
BBG_environ	-0.0806	-0.1128	-0.1759	-0.1773	0.3987
BBG_social	-0.1173	-0.0896	-0.1419	-0.1424	0.2304
BBG_govn	-0.1281	-0.0674	-0.1251	-0.1165	0.39
beta	1	0.0541	-0.0136	-0.1176	-0.053
blockholders		1	0.9186	0.2288	-0.2516
blockholder_ownership			1	0.492	-0.3634
blockholder_average_stake				1	-0.2141
institutional_investors					1

	institutional_investor_ownership	institutional_investor_avg_stake	log_mktcap	ownership_concentration (HHI)	ROA
annualized total returns	0.0378	-0.0773	0.1199	-0.0895	-0.0267
BBG_ESG	-0.2092	-0.3663	0.3723	0.009	0.0145
BBG_environ	-0.2014	-0.3644	0.3763	0.0048	0.0204
BBG_social	-0.1828	-0.2624	0.2363	0.034	-0.0103
BBG_govn	-0.1535	-0.3403	0.3745	-0.0284	-0.0157
beta	0.0657	0.1059	-0.0749	0.0598	-0.1445
blockholders	0.6398	0.4043	-0.282	-0.1316	-0.2275
blockholder_ownership	0.6668	0.5082	-0.3929	-0.0466	-0.2348
blockholder_average_stake	0.4736	0.2773	-0.2629	-0.1029	-0.0249
institutional_investors	-0.2839	-0.7485	0.9244	-0.1881	0.2052
institutional_investor_ownership	1	0.4526	-0.3484	-0.4007	-0.0577
institutional_investor_avg_stake		1	-0.7918	0.189	-0.2189
log_mktcap			1	-0.1496	0.2024
ownership_concentration (HHI)				1	-0.1786
ROA					1

	Robeco_ESG	Robeco_environ	Robeco_social	Robeco_govn	Sustainalytics_ESG
annualized total returns	0.0137	0.0247	0.0253	0.0209	0.047
BBG_ESG	0.6439	0.6324	0.6327	0.5563	0.6018
BBG_environ	0.616	0.6184	0.5968	0.5216	0.5939
BBG_social	0.5504	0.512	0.5665	0.4917	0.4855
BBG_govn	0.5274	0.5028	0.5291	0.4752	0.4331
beta	-0.0805	-0.0695	-0.0827	-0.0721	-0.0224
blockholders	-0.1518	-0.1529	-0.1329	-0.1416	-0.116
blockholder_ownership	-0.196	-0.195	-0.1745	-0.1708	-0.1504
blockholder_average_stake	-0.1753	-0.1843	-0.1563	-0.1364	-0.1537
institutional_investors	0.3223	0.3399	0.2974	0.2389	0.3077
institutional_investor_ownership	-0.158	-0.1533	-0.1428	-0.1224	-0.1266
institutional_investor_avg_stake	-0.3202	-0.3199	-0.2938	-0.2578	-0.2675
log_mktcap	0.3304	0.3536	0.3015	0.2422	0.29
ownership_concentration (HHI)	-0.0048	-0.0231	0.0113	-0.0031	0.0196
ROA	0.1057	0.1097	0.0985	0.0718	0.1523
Robeco_ESG	1	0.9494	0.9433	0.9176	0.6799
Robeco_environ		1	0.8772	0.8296	0.6935
Robeco_social			1	0.8471	0.6412
Robeco_govn				1	0.5766
Sustainalytics_ESG					1

	Sustainalytics_environ	Sustainalytics_social	Sustainalytics_govn	Tobin_Q	totDebt_to_mktcap
annualized total returns	0.057	0.0455	0.0158	0.1432	-0.0912
BBG_ESG	0.523	0.5311	0.4437	-0.0456	0.0744
BBG_environ	0.5264	0.5233	0.4142	-0.0374	0.0697
BBG_social	0.3905	0.4456	0.4125	-0.0506	0.0611
BBG_govn	0.3742	0.3729	0.3516	-0.0847	0.1059
beta	-0.018	0.0016	-0.0568	-0.0487	0.083
blockholders	-0.107	-0.0893	-0.0653	-0.0386	0.0046
blockholder_ownership	-0.1399	-0.1255	-0.063	-0.0414	0.0134
blockholder_average_stake	-0.1849	-0.1217	-0.0118	-0.007	-0.0508
institutional_investors	0.3383	0.2803	0.0811	0.1563	-0.0856
institutional_investor_ownership	-0.1489	-0.1103	0.0196	0.0259	-0.1055
institutional_investor_avg_stake	-0.2889	-0.2295	-0.0911	-0.1262	0.0625
log_mktcap	0.3359	0.2604	0.0342	0.2038	-0.0925
ownership_concentration (HHI)	0.0073	0.037	-0.0347	-0.0802	0.1292
ROA	0.1465	0.1155	0.1319	0.4998	-0.3061
Robeco_ESG	0.6431	0.5675	0.4698	0.0467	0.0289
Robeco_environ	0.6883	0.5624	0.4519	0.0694	0.0187
Robeco_social	0.5957	0.5519	0.4517	0.0337	0.0207
Robeco_govn	0.5232	0.4821	0.4516	0.0059	0.0233
Sustainalytics_ESG	0.8769	0.855	0.6211	0.1215	-0.0372
Sustainalytics_environ	1	0.6312	0.4253	0.1328	-0.0432
Sustainalytics_social		1	0.4137	0.1096	-0.0532
Sustainalytics_govn			1	0.062	-0.0113
Tobin_Q				1	-0.4015
totDebt_to_mktcap					1

	volatility	log_GHG_emissions
annualized total returns	-0.0106	-0.0303
BBG_ESG	-0.1261	0.283
BBG_environ	-0.1269	0.2537
BBG_social	-0.0794	0.2587
BBG_govn	-0.1731	0.2701
beta	0.3978	-0.1404
blockholders	0.1718	-0.0364
blockholder_ownership	0.1763	-0.1144
blockholder_average_stake	-0.0173	-0.2265
institutional_investors	-0.3382	0.2507
institutional_investor_ownership	0.1142	-0.2087
institutional_investor_avg_stake	0.3492	-0.265
log_mktcap	-0.3723	0.2385
ownership_concentration (HHI)	0.1546	-0.0549
ROA	-0.3041	-0.1603
Robeco_ESG	-0.161	-0.0448
Robeco_environ	-0.1602	-0.0541
Robeco_social	-0.151	-0.0191
Robeco_govn	-0.1333	-0.0634
Sustainalytics_ESG	-0.0981	-0.0924
Sustainalytics_environ	-0.1366	-0.1218
Sustainalytics_social	-0.0403	-0.0433
Sustainalytics_govn	-0.067	-0.0403
Tobin_Q	-0.0447	-0.2963
totDebt_to_mktcap	0.0961	0.2063
volatility	1	-0.0263
log_GHG_emissions		1

Table 3 – ESG composite and component rankings

This table shows the relative importance that each data provider gives the three components of ESG in their composite ESG rankings. We regress the component rankings of each ESG data provider onto the composite ranking. Dummy variables are used to control for year and industry effects. Coefficients are shown with asterisks denoting statistical significance, and standard errors appear in parentheses below coefficients.

dependent variable:	BBG_ESG		Sustainalytics_ESG		Robeco_ESG
const	0.3027	const	-8.4626***	const	-3.1285**
	(0.2020)		(1.8455)		(1.5096)
BBG_environ	0.5248***	Sustainalytics_environ	0.4486***	Robeco_environ	0.4102***
	(0.0013)		(0.0083)		(0.0118)
BBG_social	0.2452***	Sustainalytics_social	0.4455***	Robeco_social	0.3205***
	(0.0015)		(0.0087)		(0.0120)
BBG_govn	0.2253***	Sustainalytics_govn	0.2382***	Robeco_govn	0.3211***
	(0.0029)		(0.0079)		(0.0115)
Year effects	yes	Year effects	yes	Year effects	yes
Industry effects	yes	Industry effects	yes	Industry effects	yes
n	984	n	984	n	984
R-squared	0.999	R-squared	0.961	R-squared	0.9765

Standard errors in parentheses

Statistical significance is denoted at the *10%, **5%, and ***1% levels

Table 4 – ESG and institutional investors

This table shows how the holdings of institutional investors are related to ESG scores and financial data. We regress component and composite ESG scores along with common financial data of companies onto the number of 13F filers (standardized with z-scores). Dummy variables are used to control for year and industry effects. Coefficients are shown with asterisks denoting statistical significance, and standard errors appear in parentheses below coefficients.

dependent variable: institutional investors (z-scaled)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
const	-9.188651***	-9.124187***	-9.246296***	-9.413263***	-9.237801***	-9.233141***	-9.242298***	-9.248967***	-9.211198***	-9.204422***	-9.224747***	-9.317057***
	(0.1816)	(0.1839)	(0.1811)	(0.1888)	(0.1810)	(0.1812)	(0.1809)	(0.1810)	(0.1804)	(0.1811)	(0.1805)	(0.1809)
log_mktcap	0.883178***	0.879964***	0.897509***	0.880586***	0.892346***	0.891717***	0.892757***	0.894069***	0.886118***	0.886287***	0.888629***	0.896293***
	(0.0136)	(0.0136)	(0.0130)	(0.0136)	(0.0133)	(0.0134)	(0.0132)	(0.0130)	(0.0130)	(0.0132)	(0.0130)	(0.0125)
Tobin_Q	-0.057168***	-0.056561***	-0.060801***	-0.056498***	-0.059842***	-0.059976***	-0.059679***	-0.059745***	-0.060159***	-0.060805***	-0.059886***	-0.060338***
	(0.0126)	(0.0126)	(0.0126)	(0.0126)	(0.0126)	(0.0126)	(0.0126)	(0.0126)	(0.0125)	(0.0126)	(0.0126)	(0.0125)
totDebt_to_mktcap	0.022061	0.020787	0.028746	0.020291	0.02613	0.026155	0.026469	0.027199	0.025104	0.026248	0.026758	0.025575
	(0.0284)	(0.0284)	(0.0285)	(0.0284)	(0.0285)	(0.0285)	(0.0285)	(0.0284)	(0.0283)	(0.0283)	(0.0283)	(0.0282)
beta	0.022105	0.02232	0.017258	0.024242	0.019741	0.019722	0.019856	0.019233	0.0209	0.019507	0.020125	0.022142
	(0.0260)	(0.0260)	(0.0262)	(0.0260)	(0.0261)	(0.0261)	(0.0262)	(0.0261)	(0.0260)	(0.0260)	(0.0260)	(0.0259)
ROA	0.006953***	0.006958***	0.007010***	0.006915***	0.006985***	0.007015***	0.006969***	0.006984***	0.006727***	0.006926***	0.006933***	0.006353***
	(0.0023)	(0.0023)	(0.0023)	(0.0023)	(0.0023)	(0.0023)	(0.0023)	(0.0023)	(0.0023)	(0.0023)	(0.0023)	(0.0023)
BBG_ESG	0.002706**											
	(0.0011)											
BBG_environ		0.002473***										
		(0.0008)										
BBG_social			-0.000332									
			(0.0010)									
BBG_govn				0.006017***								
				(0.0020)								
Robeco_ESG					0.00049							
					(0.0005)							
Robeco_environ						0.000536						
						(0.0005)						
Robeco_social							0.000465					
							(0.0005)					
Robeco_govn								0.000405				
								(0.0005)				
Sustainalytics_ESG									0.001527***			
									(0.0005)			
Sustainalytics_environ										0.001183**		
										(0.0005)		
Sustainalytics_social											0.001210**	
											(0.0005)	
Sustainalytics_govn												0.001753***
												(0.0005)
Year effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Industry effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
n	984	984	984	984	984	984	984	984	984	984	984	984
R-squared	0.871148	0.871684	0.870151	0.871511	0.870277	0.870299	0.870274	0.870225	0.871492	0.871064	0.871053	0.87198

Standard errors in parentheses

Statistical significance is denoted at the *10%, **5%, and ***1% levels

Table 5 – ESG and blockholders

This table shows how the holdings of blockholders with a minimum 5% stake in a company are related to ESG scores and financial data. We regress component and composite ESG scores along with common financial data of companies onto the number of 13D/G filers (standardized with z-scores). Dummy variables are used to control for year and industry effects. Coefficients are shown with asterisks denoting statistical significance, and standard errors appear in parentheses below coefficients.

dependent variable: blockholders (z-scaled)												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
const	2.232580***	2.222297***	2.258246***	2.178850***	2.260390***	2.256071***	2.275460***	2.310398***	2.265431***	2.302274***	2.269584***	2.336047***
	(0.5425)	(0.5505)	(0.5384)	(0.5647)	(0.5388)	(0.5395)	(0.5385)	(0.5382)	(0.5397)	(0.5409)	(0.5392)	(0.5422)
log_mktcap	-0.280885***	-0.284393***	-0.279644***	-0.302086***	-0.279425***	-0.281869***	-0.281938***	-0.277711***	-0.287536***	-0.297796***	-0.287807***	-0.292383***
	(0.0406)	(0.0406)	(0.0387)	(0.0408)	(0.0396)	(0.0399)	(0.0392)	(0.0386)	(0.0390)	(0.0395)	(0.0387)	(0.0375)
Tobin_Q	0.112054***	0.113013***	0.110694***	0.117313***	0.112996***	0.113869***	0.112723***	0.110545***	0.114784***	0.114730***	0.114587***	0.114842***
	(0.0377)	(0.0377)	(0.0376)	(0.0377)	(0.0375)	(0.0375)	(0.0376)	(0.0375)	(0.0375)	(0.0375)	(0.0375)	(0.0375)
totDebt_to_mktcap	-0.07547	-0.077199	-0.074294	-0.08563	-0.074234	-0.076242	-0.075882	-0.074608	-0.079356	-0.081856	-0.079978	-0.078869
	(0.0849)	(0.0849)	(0.0846)	(0.0850)	(0.0848)	(0.0848)	(0.0847)	(0.0846)	(0.0846)	(0.0846)	(0.0846)	(0.0846)
beta	-0.000013	0.001472	-0.004701	0.007422	-0.002082	-0.000356	-0.001834	-0.004362	0.002204	0.004423	0.002316	0.000468
	(0.0778)	(0.0777)	(0.0778)	(0.0779)	(0.0778)	(0.0778)	(0.0778)	(0.0777)	(0.0777)	(0.0777)	(0.0777)	(0.0777)
ROA	-0.032683***	-0.032706***	-0.032706***	-0.032787***	-0.032660***	-0.032748***	-0.032619***	-0.032583***	-0.032595***	-0.032773***	-0.032685***	-0.032238***
	(0.0068)	(0.0068)	(0.0068)	(0.0068)	(0.0068)	(0.0068)	(0.0068)	(0.0068)	(0.0068)	(0.0068)	(0.0068)	(0.0068)
BBG_ESG	-0.002369											
	(0.0032)											
BBG_environ		-0.001215										
		(0.0023)										
BBG_social			-0.003913									
			(0.0029)									
BBG_govn				0.00365								
				(0.0060)								
Robeco_ESG					-0.001568							
					(0.0015)							
Robeco_environ						-0.001208						
						(0.0015)						
Robeco_social							-0.001337					
							(0.0015)					
Robeco_govn								-0.002545				
								(0.0016)				
Sustainalytics_ESG									-0.000733			
									(0.0015)			
Sustainalytics_environ										0.00062		
										(0.0014)		
Sustainalytics_social											-0.000726	
											(0.0015)	
Sustainalytics_govn												-0.001319
												(0.0015)
Year effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Industry effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
n	984	984	984	984	984	984	984	984	984	984	984	984
R-squared	0.17875	0.178462	0.180059	0.178557	0.179256	0.178801	0.179028	0.180811	0.178418	0.178378	0.178431	0.178942

Standard errors in parentheses

Statistical significance is denoted at the *10%, **5%, and ***1% levels

Table 6 – ESG and ownership concentration

This table shows how ownership concentration is related to ESG scores. We regress component and composite ESG scores along with common financial data of companies onto the HHI ownership concentration score (for details of HHI calculation, see Table 1). Dummy variables are used to control for year and industry effects. Coefficients are shown with asterisks denoting statistical significance, and standard errors appear in parentheses below coefficients.

dependent variable: ownership_concentration (HHI)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
const	0.135946***	0.136492***	0.134100***	0.132542***	0.133772***	0.133261***	0.133166***	0.131624***	0.136596***	0.137112***	0.135871***	0.133138***
	(0.0315)	(0.0320)	(0.0313)	(0.0328)	(0.0313)	(0.0314)	(0.0313)	(0.0313)	(0.0313)	(0.0314)	(0.0313)	(0.0315)
log_mktcap	-0.008765***	-0.008515***	-0.008764***	-0.008015***	-0.008652***	-0.008224***	-0.008794***	-0.008556***	-0.009202***	-0.009113***	-0.009250***	-0.007998***
	(0.0024)	(0.0024)	(0.0022)	(0.0024)	(0.0023)	(0.0023)	(0.0023)	(0.0022)	(0.0023)	(0.0023)	(0.0022)	(0.0022)
Tobin_Q	0.003789*	0.003721*	0.003852*	0.003604	0.003696*	0.003622*	0.003765*	0.003765*	0.003633*	0.00356	0.003689*	0.003599*
	(0.0022)	(0.0022)	(0.0022)	(0.0022)	(0.0022)	(0.0022)	(0.0022)	(0.0022)	(0.0022)	(0.0022)	(0.0022)	(0.0022)
totDebt_to_mktcap	0.010065**	0.010187**	0.010029**	0.010411**	0.010089**	0.010322**	0.010046**	0.010184**	0.010059**	0.010206**	0.010189**	0.010435**
	(0.0049)	(0.0049)	(0.0049)	(0.0049)	(0.0049)	(0.0049)	(0.0049)	(0.0049)	(0.0049)	(0.0049)	(0.0049)	(0.0049)
beta	-0.000479	-0.000582	-0.000223	-0.000712	-0.000434	-0.000634	-0.000308	-0.000417	-0.000376	-0.000549	-0.000371	-0.000743
	(0.0045)	(0.0045)	(0.0045)	(0.0045)	(0.0045)	(0.0045)	(0.0045)	(0.0045)	(0.0045)	(0.0045)	(0.0045)	(0.0045)
ROA	-0.001655***	-0.001653***	-0.001653***	-0.001652***	-0.001655***	-0.001651***	-0.001660***	-0.001657***	-0.001684***	-0.001660***	-0.001663***	-0.001648***
	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0004)
BBG_ESG	0.000157											
	(0.0002)											
BBG_environ		0.000078										
		(0.0001)										
BBG_social			0.000233									
			(0.0002)									
BBG_govn				0.000006								
				(0.0004)								
Robeco_ESG					0.000079							
					(0.0001)							
Robeco_environ						0.000026						
						(0.0001)						
Robeco_social							0.000101					
							(0.0001)					
Robeco_govn								0.000096				
								(0.0001)				
Sustainalytics_ESG									0.000178**			
									(0.0001)			
Sustainalytics_environ										0.00013		
										(0.0001)		
Sustainalytics_social											0.000194**	
											(0.0001)	
Sustainalytics_govn												-0.00001
												(0.0001)
Year effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Industry effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
n	984	984	984	984	984	984	984	984	984	984	984	984
R-squared	0.061673	0.061221	0.063093	0.060852	0.061752	0.060945	0.062458	0.062115	0.065333	0.063572	0.066588	0.060866

Standard errors in parentheses

Statistical significance is denoted at the *10%, **5%, and ***1% levels

Table 7 – ESG and total institutional ownership

This table shows how total institutional ownership of companies is related to ESG characteristics. We regress component and composite ESG scores along with common financial data of companies onto the total percentage of shares owned by institutional investors. Dummy variables are used to control for year and industry effects. Coefficients are shown with asterisks denoting statistical significance, and standard errors appear in parentheses below coefficients.

dependent variable: percentage of shares held by institutional investors

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
const	1.198554***	1.193282***	1.207674***	1.210671***	1.209894***	1.209394***	1.212200***	1.215794***	1.206273***	1.202221***	1.208846***	1.205507***
	(0.0708)	(0.0719)	(0.0702)	(0.0739)	(0.0704)	(0.0705)	(0.0704)	(0.0704)	(0.0705)	(0.0706)	(0.0704)	(0.0709)
log_mktcap	-0.048001***	-0.048756***	-0.048414***	-0.051720***	-0.049425***	-0.049887***	-0.049698***	-0.050162***	-0.049332***	-0.048697***	-0.049753***	-0.051496***
	(0.0053)	(0.0053)	(0.0050)	(0.0053)	(0.0052)	(0.0052)	(0.0051)	(0.0050)	(0.0051)	(0.0052)	(0.0051)	(0.0049)
Tobin_Q	0.008320*	0.008538*	0.008171*	0.009240*	0.008878*	0.009023*	0.008809*	0.008790*	0.009122*	0.009281*	0.009058*	0.009192*
	(0.0049)	(0.0049)	(0.0049)	(0.0049)	(0.0049)	(0.0049)	(0.0049)	(0.0049)	(0.0049)	(0.0049)	(0.0049)	(0.0049)
totDebt_to_mktcap	-0.032244***	-0.032628***	-0.032291***	-0.033973***	-0.032814***	-0.033164***	-0.033016***	-0.033298***	-0.033211***	-0.033321***	-0.033537***	-0.034132***
	(0.0111)	(0.0111)	(0.0110)	(0.0111)	(0.0111)	(0.0111)	(0.0111)	(0.0111)	(0.0111)	(0.0110)	(0.0111)	(0.0111)
beta	0.004751	0.005117	0.003852	0.005933	0.004942	0.005243	0.004918	0.005127	0.005226	0.005415	0.00536	0.006281
	(0.0102)	(0.0102)	(0.0101)	(0.0102)	(0.0102)	(0.0102)	(0.0102)	(0.0102)	(0.0101)	(0.0101)	(0.0101)	(0.0102)
ROA	0.000056	0.00005	0.000048	0.000041	0.000053	0.000039	0.000061	0.000055	0.000101	0.000064	0.000058	-0.000027
	(0.0009)	(0.0009)	(0.0009)	(0.0009)	(0.0009)	(0.0009)	(0.0009)	(0.0009)	(0.0009)	(0.0009)	(0.0009)	(0.0009)
BBG_ESG	-0.000711*											
	(0.0004)											
BBG_environ		-0.00041										
		(0.0003)										
BBG_social			-0.000936**									
			(0.0004)									
BBG_govn				0.00009								
				(0.0008)								
Robeco_ESG					-0.000247							
					(0.0002)							
Robeco_environ						-0.000182						
						(0.0002)						
Robeco_social							-0.000226					
							(0.0002)					
Robeco_govn								-0.000228				
								(0.0002)				
Sustainalytics_ESG									-0.000319			
									(0.0002)			
Sustainalytics_environ										-0.000325*		
										(0.0002)		
Sustainalytics_social											-0.000269	
											(0.0002)	
Sustainalytics_govn												0.000185
												(0.0002)
Year effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Industry effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
n	984	984	984	984	984	984	984	984	984	984	984	984
R-squared	0.214799	0.213694	0.217967	0.212	0.213467	0.212757	0.213328	0.213161	0.214362	0.214809	0.213804	0.212814

Standard errors in parentheses

Statistical significance is denoted at the *10%, **5%, and ***1% levels

Table 8 – ESG and total blockholder ownership

This table shows how total blockholder ownership of companies is related to ESG characteristics. We regress component and composite ESG scores along with common financial data of companies onto the total percentage of shares owned by blockholders. Dummy variables are used to control for year and industry effects. Coefficients are shown with asterisks denoting statistical significance, and standard errors appear in parentheses below coefficients.

dependent variable: percentage of shares held by blockholders

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
const	0.610899***	0.609346***	0.614463***	0.613669***	0.614414***	0.613963***	0.616325***	0.620021***	0.615584***	0.618700***	0.616174***	0.620320***
	(0.0455)	(0.0462)	(0.0452)	(0.0474)	(0.0452)	(0.0453)	(0.0452)	(0.0451)	(0.0453)	(0.0454)	(0.0453)	(0.0455)
log_mktcap	-0.037054***	-0.037460***	-0.037085***	-0.038828***	-0.036882***	-0.037224***	-0.037247***	-0.036993***	-0.038063***	-0.038936***	-0.038172***	-0.038507***
	(0.0034)	(0.0034)	(0.0032)	(0.0034)	(0.0033)	(0.0033)	(0.0033)	(0.0032)	(0.0033)	(0.0033)	(0.0033)	(0.0032)
Tobin_Q	0.012314***	0.012426***	0.012204***	0.012753***	0.012434***	0.012547***	0.012410***	0.012224***	0.012662***	0.012659***	0.012650***	0.012670***
	(0.0032)	(0.0032)	(0.0032)	(0.0032)	(0.0031)	(0.0031)	(0.0032)	(0.0031)	(0.0031)	(0.0031)	(0.0031)	(0.0031)
totDebt_to_mktcap	-0.003996	-0.004197	-0.003943	-0.004828	-0.003846	-0.004113	-0.004076	-0.00403	-0.004536	-0.004752	-0.004608	-0.004552
	(0.0071)	(0.0071)	(0.0071)	(0.0071)	(0.0071)	(0.0071)	(0.0071)	(0.0071)	(0.0071)	(0.0071)	(0.0071)	(0.0071)
beta	-0.014780**	-0.014602**	-0.015248**	-0.014199**	-0.015035**	-0.014806**	-0.014978**	-0.015144**	-0.014452**	-0.014259**	-0.014418**	-0.014513**
	(0.0065)	(0.0065)	(0.0065)	(0.0065)	(0.0065)	(0.0065)	(0.0065)	(0.0065)	(0.0065)	(0.0065)	(0.0065)	(0.0065)
ROA	-0.003043***	-0.003045***	-0.003046***	-0.003050***	-0.003040***	-0.003051***	-0.003035***	-0.003033***	-0.003036***	-0.003052***	-0.003045***	-0.003019***
	(0.0006)	(0.0006)	(0.0006)	(0.0006)	(0.0006)	(0.0006)	(0.0006)	(0.0006)	(0.0006)	(0.0006)	(0.0006)	(0.0006)
BBG_ESG	-0.000298											
	(0.0003)											
BBG_environ		-0.000158										
		(0.0002)										
BBG_social			-0.000435*									
			(0.0002)									
BBG_govn				0.00012								
				(0.0005)								
Robeco_ESG					-0.000196							
					(0.0001)							
Robeco_environ						-0.000147						
						(0.0001)						
Robeco_social							-0.000161					
							(0.0001)					
Robeco_govn								-0.000262**				
								(0.0001)				
Sustainalytics_ESG									-0.000067			
									(0.0001)			
Sustainalytics_environ										0.000049		
										(0.0001)		
Sustainalytics_social											-0.000053	
											(0.0001)	
Sustainalytics_govn												-0.000079
												(0.0001)
Year effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Industry effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
n	984	984	984	984	984	984	984	984	984	984	984	984
R-squared	0.252332	0.251781	0.254175	0.251246	0.253338	0.252352	0.252751	0.254774	0.251434	0.251346	0.251358	0.251545

Standard errors in parentheses

Statistical significance is denoted at the *10%, **5%, and ***1% levels

Table 9 – ESG and institutional investor stakes

This table shows how the ownership stakes of institutional investors is related to ESG characteristics of companies. We regress component and composite ESG scores along with common financial data of companies onto the average percentage of shares held by institutional investors. Dummy variables are used to control for year and industry effects. Coefficients are shown with asterisks denoting statistical significance, and standard errors appear in parentheses below coefficients.

dependent variable: average holding size of institutional investors (as percent of all shares)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
const	0.671497***	0.667666***	0.676228***	0.686067***	0.675381***	0.674619***	0.677251***	0.680546***	0.674438***	0.673891***	0.676389***	0.685066***
	(0.0217)	(0.0221)	(0.0216)	(0.0227)	(0.0215)	(0.0216)	(0.0216)	(0.0215)	(0.0216)	(0.0217)	(0.0217)	(0.0217)
log_mktcap	-0.052897***	-0.053028***	-0.053457***	-0.053688***	-0.052810***	-0.053023***	-0.053094***	-0.053152***	-0.053336***	-0.053400***	-0.053802***	-0.054432***
	(0.0016)	(0.0016)	(0.0016)	(0.0016)	(0.0016)	(0.0016)	(0.0016)	(0.0015)	(0.0016)	(0.0016)	(0.0016)	(0.0015)
Tobin_Q	0.003329**	0.003377**	0.003386**	0.003523**	0.003471**	0.003571**	0.003430**	0.003329**	0.003681**	0.003749**	0.003666**	0.003701**
	(0.0015)	(0.0015)	(0.0015)	(0.0015)	(0.0015)	(0.0015)	(0.0015)	(0.0015)	(0.0015)	(0.0015)	(0.0015)	(0.0015)
totDebt_to_mktcap	-0.000348	-0.000427	-0.000561	-0.000687	-0.000237	-0.000448	-0.000429	-0.000519	-0.000732	-0.000864	-0.000946	-0.00081
	(0.0034)	(0.0034)	(0.0034)	(0.0034)	(0.0034)	(0.0034)	(0.0034)	(0.0034)	(0.0034)	(0.0034)	(0.0034)	(0.0034)
beta	0.002791	0.0029	0.002635	0.002975	0.002562	0.002743	0.002577	0.002577	0.002959	0.003116	0.003097	0.002869
	(0.0031)	(0.0031)	(0.0031)	(0.0031)	(0.0031)	(0.0031)	(0.0031)	(0.0031)	(0.0031)	(0.0031)	(0.0031)	(0.0031)
ROA	-0.000758***	-0.000760***	-0.000763***	-0.000760***	-0.000756***	-0.000767***	-0.000750***	-0.000752***	-0.000734***	-0.000756***	-0.000758***	-0.000701**
	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
BBG_ESG	-0.000316**											
	(0.0001)											
BBG_environ		-0.000213**										
		(0.0001)										
BBG_social			-0.000301***									
			(0.0001)									
BBG_govn				-0.000287								
				(0.0002)								
Robeco_ESG					-0.000196***							
					(0.0001)							
Robeco_environ						-0.000162***						
						(0.0001)						
Robeco_social							-0.000171***					
							(0.0001)					
Robeco_govn								-0.000223***				
								(0.0001)				
Sustainalytics_ESG									-0.000164***			
									(0.0001)			
Sustainalytics_environ										-0.000122**		
										(0.0001)		
Sustainalytics_social											-0.000100*	
											(0.0001)	
Sustainalytics_govn												-0.000170***
												(0.0001)
Year effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Industry effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
n	984	984	984	984	984	984	984	984	984	984	984	984
R-squared	0.647294	0.646841	0.647596	0.645248	0.649098	0.647559	0.648306	0.650001	0.647651	0.646536	0.64584	0.647977

Standard errors in parentheses

Statistical significance is denoted at the *10%, **5%, and ***1% levels

Table 10 – ESG and blockholder stakes

This table shows how the ownership stakes of blockholders is related to ESG characteristics of companies. We regress component and composite ESG scores along with common financial data of companies onto the average percentage of shares held by blockholders. Dummy variables are used to control for year and industry effects. Coefficients are shown with asterisks denoting statistical significance, and standard errors appear in parentheses below coefficients.

dependent variable: average holding size of blockholders (as percent of all shares)												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
const	15.058327***	14.958229***	15.185133***	15.267296***	15.138750***	15.086125***	15.206921***	15.302755***	15.114402***	14.973041***	15.188709***	15.194608***
	(0.9459)	(0.9600)	(0.9394)	(0.9859)	(0.9372)	(0.9383)	(0.9379)	(0.9378)	(0.9399)	(0.9390)	(0.9407)	(0.9467)
log_mktcap	-0.507756***	-0.511410***	-0.523476***	-0.545254***	-0.491502***	-0.488055***	-0.506352***	-0.511997***	-0.512609***	-0.483340***	-0.532078***	-0.548766***
	(0.0708)	(0.0709)	(0.0674)	(0.0712)	(0.0689)	(0.0694)	(0.0684)	(0.0672)	(0.0678)	(0.0686)	(0.0676)	(0.0655)
Tobin_Q	0.06628	0.067608	0.068097	0.075544	0.067974	0.070392	0.067577	0.065528	0.075411	0.078746	0.075216	0.076455
	(0.0657)	(0.0657)	(0.0656)	(0.0658)	(0.0653)	(0.0652)	(0.0654)	(0.0654)	(0.0653)	(0.0651)	(0.0654)	(0.0655)
totDebt_to_mktcap	-0.189122	-0.191298	-0.195216	-0.206356	-0.179143	-0.181816	-0.188171	-0.192596	-0.197263	-0.195542	-0.20502	-0.209368
	(0.1480)	(0.1480)	(0.1477)	(0.1483)	(0.1475)	(0.1474)	(0.1476)	(0.1473)	(0.1474)	(0.1469)	(0.1476)	(0.1477)
beta	-0.432631***	-0.429700***	-0.436167***	-0.421193***	-0.444777***	-0.442511***	-0.441708***	-0.439646***	-0.430113***	-0.429784***	-0.424438***	-0.417762***
	(0.1356)	(0.1356)	(0.1358)	(0.1360)	(0.1353)	(0.1353)	(0.1356)	(0.1354)	(0.1353)	(0.1348)	(0.1355)	(0.1357)
ROA	0.001937	0.001881	0.001817	0.00179	0.002079	0.001668	0.002214	0.002135	0.002754	0.002297	0.001928	0.001446
	(0.0118)	(0.0118)	(0.0118)	(0.0118)	(0.0118)	(0.0118)	(0.0118)	(0.0118)	(0.0118)	(0.0117)	(0.0118)	(0.0118)
BBG_ESG	-0.008367											
	(0.0055)											
BBG_environ		-0.005605										
		(0.0041)										
BBG_social			-0.007691									
			(0.0050)									
BBG_govn				-0.001311								
				(0.0106)								
Robeco_ESG					-0.006870***							
					(0.0026)							
Robeco_environ						-0.006906**						
						(0.0027)						
Robeco_social							-0.005370**					
							(0.0025)					
Robeco_govn								-0.006326**				
								(0.0027)				
Sustainalytics_ESG									-0.005350**			
									(0.0027)			
Sustainalytics_environ										-0.007628***		
										(0.0025)		
Sustainalytics_social											-0.002582	
											(0.0026)	
Sustainalytics_govn												0.000866
												(0.0027)
Year effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Industry effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
n	984	984	984	984	984	984	984	984	984	984	984	984
R-squared	0.14942	0.148996	0.149512	0.147074	0.154003	0.153809	0.151644	0.152564	0.151118	0.156491	0.148077	0.147167

Standard errors in parentheses

Statistical significance is denoted at the *10%, **5%, and ***1% levels

Table 11 – ESG and risk-adjusted returns

This table shows the relationship between ESG scores and annual security returns. We regress component and composite ESG scores along with common financial data of companies onto total annual returns (assuming reinvested dividends). We include volatility as a control variable for security riskiness. Dummy variables are used to control for year and industry effects. Coefficients are shown with asterisks denoting statistical significance, and standard errors appear in parentheses below coefficients.

dependent variable: annualized total returns (with reinvested dividends)												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
const	-49.751289***	-48.539418***	-51.533935***	-55.235903***	-52.277466***	-52.077934***	-52.434486***	-52.709985***	-51.967632***	-51.493642***	-52.455080***	-53.417068***
	(13.4806)	(13.6640)	(13.3782)	(13.9816)	(13.4221)	(13.4378)	(13.4133)	(13.4260)	(13.4443)	(13.4660)	(13.4455)	(13.5196)
Tobin_Q	2.868681***	2.839767***	2.899971***	2.780411***	2.734585***	2.737409***	2.765325***	2.759431***	2.722726***	2.711102***	2.722037***	2.712639***
	(0.7898)	(0.7899)	(0.7875)	(0.7903)	(0.7877)	(0.7874)	(0.7880)	(0.7886)	(0.7866)	(0.7866)	(0.7869)	(0.7867)
volatility	0.273797***	0.270675***	0.281793***	0.270679***	0.266481***	0.266695***	0.271084***	0.268063***	0.265871***	0.266157***	0.265260***	0.270598***
	(0.1005)	(0.1005)	(0.1005)	(0.1008)	(0.1007)	(0.1006)	(0.1008)	(0.1007)	(0.1006)	(0.1005)	(0.1006)	(0.1009)
log_mktcap	2.696606***	2.792625***	2.791799***	3.057704***	3.226224***	3.180040***	3.094336***	3.172897***	3.185777***	3.086297***	3.326827***	3.305486***
	(0.9805)	(0.9825)	(0.9384)	(0.9772)	(0.9607)	(0.9697)	(0.9517)	(0.9401)	(0.9511)	(0.9626)	(0.9486)	(0.9172)
totDebt_to_mktcap	-7.067801***	-7.027364***	-7.026709***	-6.952617***	-6.874003***	-6.881839***	-6.942869***	-6.905040***	-6.850722***	-6.870927***	-6.827585***	-6.856517***
	(1.8284)	(1.8294)	(1.8221)	(1.8337)	(1.8342)	(1.8313)	(1.8309)	(1.8299)	(1.8267)	(1.8266)	(1.8263)	(1.8264)
BBG_ESG	0.123970*											
	(0.0716)											
BBG_environ		0.076783										
		(0.0533)										
BBG_social			0.155590**									
			(0.0642)									
BBG_govn				0.097476								
				(0.1341)								
Robeco_ESG					0.013672							
					(0.0350)							
Robeco_environ						0.026901						
						(0.0328)						
Robeco_social							0.022499					
							(0.0357)					
Robeco_govn								0.016342				
								(0.0350)				
Sustainalytics_ESG									0.016342			
									(0.0350)			
Sustainalytics_environ										0.024443		
										(0.0330)		
Sustainalytics_social											-0.003348	
											(0.0338)	
Sustainalytics_govn												0.02157
												(0.0345)
Year effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Industry effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
n	984	984	984	984	984	984	984	984	984	984	984	984
R-squared	0.166651	0.165781	0.169353	0.16432	0.163888	0.163965	0.164456	0.164197	0.164026	0.16434	0.163829	0.164189

Standard errors in parentheses

Statistical significance is denoted at the *10%, **5%, and ***1% levels

Table 12 – ESG and security risk (volatility)

This table shows the relationship between ESG scores and volatility. We regress component and composite ESG scores along with common financial data of companies onto total annual volatility. Dummy variables are used to control for year and industry effects. Coefficients are shown with asterisks denoting statistical significance, and standard errors appear in parentheses below coefficients.

dependent variable: volatility												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
const	56.301780***	56.079295***	56.702479***	59.898133***	56.880554***	56.814318***	56.978019***	57.343850***	57.054325***	57.039711***	57.386589***	58.236327***
	(4.0942)	(4.1652)	(4.0526)	(4.2060)	(4.0546)	(4.0642)	(4.0455)	(4.0513)	(4.0665)	(4.0758)	(4.0604)	(4.0576)
Tobin_Q	0.108508	0.119301	0.100437	0.090453	0.128516	0.135622	0.112694	0.123553	0.150954	0.153021	0.155207	0.164711
	(0.2641)	(0.2641)	(0.2635)	(0.2635)	(0.2630)	(0.2630)	(0.2629)	(0.2634)	(0.2629)	(0.2630)	(0.2629)	(0.2620)
log_mktcap	-3.143988***	-3.185082***	-3.168455***	-3.050135***	-3.172042***	-3.195672***	-3.130879***	-3.227238***	-3.286614***	-3.288431***	-3.385820***	-3.307847***
	(0.3106)	(0.3108)	(0.2955)	(0.3094)	(0.3024)	(0.3054)	(0.2994)	(0.2946)	(0.2980)	(0.3021)	(0.2958)	(0.2846)
totDebt_to_mktcap	4.496102***	4.485038***	4.472788***	4.542771***	4.512625***	4.484797***	4.512474***	4.482875***	4.443586***	4.443935***	4.433741***	4.441599***
	(0.5927)	(0.5931)	(0.5910)	(0.5922)	(0.5933)	(0.5929)	(0.5917)	(0.5924)	(0.5922)	(0.5924)	(0.5920)	(0.5899)
BBG_ESG	-0.036163											
	(0.0239)											
BBG_environ		-0.02094										
		(0.0178)										
BBG_social			-0.044161**									
			(0.0214)									
BBG_govn				-0.103030**								
				(0.0446)								
Robeco_ESG					-0.017941							
					(0.0114)							
Robeco_environ						-0.01434						
						(0.0117)						
Robeco_social							-0.023513**					
							(0.0109)					
Robeco_govn								-0.016572				
								(0.0119)				
Sustainalytics_ESG									-0.005907			
									(0.0117)			
Sustainalytics_environ										-0.004605		
										(0.0110)		
Sustainalytics_social											0.00819	
											(0.0113)	
Sustainalytics_govn												-0.030129***
												(0.0115)
Year effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Industry effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
n	984	984	984	984	984	984	984	984	984	984	984	984
R-squared	0.407606	0.407001	0.408913	0.40964	0.407725	0.407091	0.409181	0.407377	0.406247	0.406193	0.406429	0.41068

Standard errors in parentheses

Statistical significance is denoted at the *10%, **5%, and ***1% levels

Table 13 – ESG and systemic risk (beta)

This table shows the relationship of ESG scores and a security's exposure to systemic risk. We regress component and composite ESG scores along with common financial data of companies onto beta (for details of beta calculation, see Table 1). Dummy variables are used to control for year and industry effects. Coefficients are shown with asterisks denoting statistical significance, and standard errors appear in parentheses below coefficients.

dependent variable: beta												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
const	1.032262***	1.008391***	1.065506***	1.262940***	1.076382***	1.066126***	1.087886***	1.115464***	1.073339***	1.077011***	1.082836***	1.154060***
	(0.2428)	(0.2471)	(0.2402)	(0.2496)	(0.2404)	(0.2410)	(0.2399)	(0.2402)	(0.2411)	(0.2418)	(0.2408)	(0.2412)
Tobin_Q	-0.028160*	-0.027466*	-0.028648*	-0.028369*	-0.026726*	-0.026285*	-0.027510*	-0.027119*	-0.024757	-0.02443	-0.02529	-0.024085
	(0.0156)	(0.0156)	(0.0156)	(0.0156)	(0.0156)	(0.0156)	(0.0156)	(0.0156)	(0.0156)	(0.0156)	(0.0156)	(0.0156)
log_mktcap	-0.015199	-0.017664	-0.017603	-0.013425	-0.016698	-0.017044	-0.016139	-0.021257	-0.0215	-0.023394	-0.022748	-0.028908*
	(0.0184)	(0.0184)	(0.0175)	(0.0184)	(0.0179)	(0.0181)	(0.0178)	(0.0175)	(0.0177)	(0.0179)	(0.0175)	(0.0169)
totDebt_to_mktcap	0.224168***	0.223558***	0.222219***	0.225725***	0.225801***	0.224065***	0.224689***	0.223358***	0.220759***	0.220575***	0.219939***	0.219713***
	(0.0352)	(0.0352)	(0.0350)	(0.0352)	(0.0352)	(0.0352)	(0.0351)	(0.0351)	(0.0351)	(0.0351)	(0.0351)	(0.0351)
BBG_ESG	-0.002867**											
	(0.0014)											
BBG_environ		-0.001777*										
		(0.0011)										
BBG_social			-0.003376***									
			(0.0013)									
BBG_govn				-0.006079**								
				(0.0026)								
Robeco_ESG					-0.001500**							
					(0.0007)							
Robeco_environ						-0.001376**						
						(0.0007)						
Robeco_social							-0.001624**					
							(0.0006)					
Robeco_govn								-0.001401**				
								(0.0007)				
Sustainalytics_ESG									-0.001159*			
									(0.0007)			
Sustainalytics_environ										-0.000732		
										(0.0007)		
Sustainalytics_social											-0.001054	
											(0.0007)	
Sustainalytics_govn												-0.001451**
												(0.0007)
Year effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Industry effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
n	984	984	984	984	984	984	984	984	984	984	984	984
R-squared	0.139531	0.13831	0.142399	0.140681	0.140337	0.139424	0.141693	0.139409	0.138277	0.136784	0.137972	0.139964

Standard errors in parentheses

Statistical significance is denoted at the *10%, **5%, and ***1% levels

Table 14 – GHG emissions and holdings data

This table shows the relationship of company greenhouse gas (GHG) emissions to various institutional investor holdings characteristics. The dependent variables in each model are various measure of institutional investor holdings – number of institutional investors (z-scaled) in column 1, number of blockholders (z-scaled) in column 2, ownership concentration (HHI) in column 3, percentage of shares held by institutional investors in column 4, percentage of shares held by blockholders in column 5, average holding size of institutional investors in column 6, and average holding size of blockholders in column 7. The independent variables are the natural log of GHG emissions along with common financial characteristics of companies as control variables. Dummy variables are used to control for year and industry effects. Coefficients are shown with asterisks denoting statistical significance, and standard errors appear in parentheses below coefficients.

dependent variables:	institutional investors (z-scaled)	blockholders (z-scaled)	ownership concentration (HHI)	percentage of shares held by institutional investors	percentage of shares held by blockholders	average holding size of institutional investors (as percent of all shares)	average holding size of blockholders (as percent of all shares)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
const	-9.969683***	1.481668*	0.166454**	1.100125***	0.531733***	0.006429***	0.141013***
	(0.3340)	(0.7701)	(0.0651)	(0.1282)	(0.0757)	(0.0004)	(0.0096)
log_mktcap	0.965550***	-0.225552***	-0.010715***	-0.042899***	-0.035701***	-0.000512***	-0.005516***
	(0.0181)	(0.0418)	(0.0035)	(0.0070)	(0.0041)	(0.0000)	(0.0005)
Tobin_Q	-0.053039***	0.102760**	0.006352*	0.008225	0.011618***	0.000009	0.000786
	(0.0177)	(0.0409)	(0.0035)	(0.0068)	(0.0040)	(0.0000)	(0.0005)
totDebt_to_mktcap	0.043355	-0.024577	0.014113*	-0.029804**	-0.000214	0.000001	-0.000284
	(0.0374)	(0.0862)	(0.0073)	(0.0144)	(0.0085)	(0.0000)	(0.0011)
beta	0.038975	0.106123	0.003016	0.017101	-0.002056	0.000027	-0.003422***
	(0.0353)	(0.0813)	(0.0069)	(0.0135)	(0.0080)	(0.0000)	(0.0010)
ROA	0.006242*	-0.023770***	-0.002250***	0.000018	-0.002495***	-0.000006	-0.000154
	(0.0032)	(0.0074)	(0.0006)	(0.0012)	(0.0007)	(0.0000)	(0.0001)
log_GHG_emissions	-0.015529	0.004508	0.000391	-0.005083	0.000608	-0.000006	0.000116
	(0.0125)	(0.0287)	(0.0024)	(0.0048)	(0.0028)	(0.0000)	(0.0004)
Year effects	yes	yes	yes	yes	yes	yes	yes
Industry effects	yes	yes	yes	yes	yes	yes	yes
n	984	984	984	984	984	984	984
R-squared	0.888156	0.224185	0.088701	0.196493	0.288619	0.634039	0.32376

Standard errors in parentheses

Statistical significance is denoted at the *10%, **5%, and ***1% levels

about ECGI

The European Corporate Governance Institute has been established to improve *corporate governance through fostering independent scientific research and related activities.*

The ECGI will produce and disseminate high quality research while remaining close to the concerns and interests of corporate, financial and public policy makers. It will draw on the expertise of scholars from numerous countries and bring together a critical mass of expertise and interest to bear on this important subject.

The views expressed in this working paper are those of the authors, not those of the ECGI or its members.

ECGI Working Paper Series in Law

https://ecgi.global/content/working-papers

Electronic Access to the Working Paper Series

The full set of ECGI working papers can be accessed through the Institute's Web-site (https://ecgi.global/content/working-papers) or SSRN:

Finance Paper Series	http://www.ssrn.com/link/ECGI-Fin.html
Law Paper Series	http://www.ssrn.com/link/ECGI-Law.html