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DISCUSSION PAPER

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Executive Compensation Tied to ESG Performance: International Evidence

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Executive Compensation Tied to ESG Performance: International Evidence

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Executive Compensation Tied to ESG Performance: International Evidence

ABSTRACT

This paper examines the reliance on ESG metrics in executive compensation contracts. In our sample of international publicly traded firms, a rapidly growing fraction incorporate ESG metrics in the compensation schemes of their top executives. Our analysis links the reliance on these metrics to firm fundamentals, the geographic location of firms, as well as the influence of institutional shareholders. Our findings also suggest that the adoption of ESG variables in managerial performance measures is accompanied by improvements in ESG performance and meaningful changes in the compensation of executives.

Keywords: ESG metrics, Executive compensation, Institutional ownership.

JEL Classifications: M12, M41, Q54.

1. Introduction

With the growing interest in Corporate Social Responsibility (CSR) principles, a broad set of Environmental, Social and Governance (ESG) variables have been proposed as metrics for gauging corporate CSR efforts. As might be expected, the proportion of global firms indicating that their executive compensation schemes are tied to ESG metrics has also grown. According to the global ISS Executive Compensation Analytics database, the share of firms indicating that some ESG metrics are Key Performance Indicators (KPI) for their executives has grown from 3% in 2010 to over 30% in 2021.[1]

The practice of including ESG metrics in executive compensation schemes (henceforth referred to simply as "ESG Pay") raises two broad sets of questions: who are the adopters of ESG Pay and what economic outcomes are associated with the inclusion of ESG metrics in executive compensation schemes? More specifically, what characteristics, such as geographic location, size, industry and ownership structure, tend to make firms more prone to adopt the practice of ESG Pay? Further, what economic outcomes, such as ESG performance and financial returns are associated with the adoption of ESG Pay? For a large sample of international publicly listed firms, our analysis examines both the determinants of, and the economic outcomes associated with ESG Pay practices.

From an agency and stewardship perspective, one would expect reliance on ESG metrics in executive compensation packages, provided a firm's owners and the Board of Directors acting on their behalf intrinsically care about ESG outcomes (Bonham and Riggs-Cragun 2022).[2] Another agency-theoretic rationale for ESG Pay emerges if ESG metrics are viewed as indicators of future

[1] See Figure1 for the actual growth rates between 2010 and 2020. The available data for 2021 indicates that the percentage of firms basing executive pay on some ESG metric has most recently grown to 38%.

[2] Recent studies in finance have suggested that some investor groups are willing to compromise financial results for improvements in certain ESG scores (Pastor et al. 2020; Riedl and Smeet 2017; Barber et al. 2021).

financial risks. Some institutional investors, for instance BlackRock, have urged firms to articulate their sustainability agenda because of impending financial risks resulting from climate change. Provided the firm's owners and its board of directors share this view, the adoption of ESG Pay would then be in line with earlier agency-theoretic findings demonstrating that reliance on operational metrics, such as product quality or customer satisfaction, can make managerial incentive contracts more efficient.[3] This prediction emerges even if the firm's share price, a key indicator of future performance, is available for contracting purposes.[4]

A distinctive characteristic of many ESG metrics, in particular those in the "E" and "S" categories, is that some of the firm's stakeholders intrinsically care about these metrics. This reflects that some of the firm's activities entail external effects, the costs of which are not fully internalized by the firm. A firm's greenhouse gas emissions or other forms of environmental pollution are prime examples of activities whose social cost are arguably not fully internalized by corporate decision makers. By including ESG metrics for activities subject to external costs in executive compensation schemes, owners convey to the firm's stakeholders that management's attention will be drawn to these external effects. In particular, a firm commitment to be "ESG conscious" may strengthen customer loyalty and make the firm's equity shares more attractive for certain investor groups.

The literature on CSR has long been concerned about the possibility of "window-dressing" or "green-washing" (Delmas and Burbano 2011; Marquis et al. 2016; Grewal and Serafeim 2021). In the context of ESG Pay, window-dressing may be tempting for firms whose owners neither intrinsically care about ESG metrics, nor believe that higher ESG scores will result in higher

[3] See, for instance, Ittner, Larcker, and Rajan (1997), Dikolli (2001), Sliwka (2002), and Dutta and Reichelstein (2003).
[4] Conversely, the need for accounting variables in addition to stock price has been demonstrated, among others, by Bushman and Indjejikian (1993); Kim and Suh (1993), Paul (1992) and Dutta and Reichelstein (2005).

profitability, except for the general benefit that results from improving the firm's corporate image with certain stakeholder groups. Ideally, those firms would want to be classified as "ESG responsible" without having to "walk the talk". Window-dressing is arguably difficult to detect in the context of ESG Pay because the measurement of these variables is frequently subjective at the firm level. Furthermore, outside observers generally do not have full information on the relative weights given to different performance indicators, the use of targets and thresholds, as well as the exact form of the payout function.

Our empirical tests are based on the ISS Executive Compensation Analytics database, covering a sample of 4,395 public firms from 21 countries between 2011 and 2020. We count a firm as practicing ESG Pay if at least one ESG criterion was considered a key performance indicator in the firm's executive compensation scheme. The criteria span a wide range of "E", "S" and "G" variables.

Our analysis shows that several external factors appear to make firms more prone to adopt ESG Pay. At a macro level, the inclusion of ESG metrics in compensation contracts is more common in countries that are generally perceived to be ESG sensitive, including the possibility that some form of ESG reporting is already mandatory in these countries. As one might expect, firms operating in environmentally burdensome industries also have a higher proclivity to adopt ESG Pay. At the firm level, we find that, aside from size and volatility, the practice of ESG Pay is associated with firms that have publicly issued environmental commitments. We also find that ESG Pay is associated with more independent boards with a higher percentage of female members and, notably with the presence of institutional investors.

As a second step in our characterization of ESG Pay adopters, we analyze the interaction between these firms and their capital providers. We collect data on engagements by the three

largest institutional investors (i.e., Blackrock, State Street, and Vanguard) and find that their engagements tend to increase the likelihood of a particular firm implementing ESG Pay. We also find that firms with ESG Pay exhibit more shareholder support on key voting items such as director elections and proposals on executive compensation. When analyzing investors' reaction to ESG Pay, we find that funds tend to tilt their portfolios towards firms that do rely on ESG Pay. Our analysis of credit agreements also reveals that adopters are more likely to issue green bonds and ESG-linked bonds.

In terms of subsequent outcomes observed for ESG adopters, we find that these firms receive on average more favorable ESG scores from outside rating agencies. We also observe a decrease in carbon emissions in cases in which the contract includes a measure specifically related to emissions. These patterns are more pronounced among ESG sensitive countries, specifically countries within the European Union. The effect of ESG Pay on shareholder wealth is less clear-cut. We find no positive association with financial outcomes, such as return on assets, and even find a decrease in stock returns after the adoption of ESG Pay. These findings are consistent with the notion that some investment groups are willing to trade improvements in those dimensions for lower returns.

Taken together, our findings on the determinants of and outcomes associated with ESG Pay are consistent with the hypothesis that ESG Pay provisions play a substantive role in executive compensation packages by supplementing traditional financial metrics.

To date, there appear to be relatively few studies examining the link between executive compensation and CSR activities. Somewhat complementary to our approach, some studies have asked whether basing compensation on CSR-contingent variables results in increased agency costs, possibly without increasing shareholder value. Higher agency costs may be the consequence

of top-level managers having intrinsic CSR preferences and their power to lobby boards of directors to include CSR variables in executive compensation contracts. Some of these studies find that contracting based on CSR criteria is more common among firms with relatively less powerful CEOs (Hong et al. 2016; Ikram et al. 2019).[5] In contrast, Bebchuk and Tallarita (2022) argue that a broader set of KPIs is helpful for executives seeking to extract larger rents from shareholders.[6]

Our result that institutional investors have a significant role in firms' decision to adopt ESG Pay adds to the burgeoning literature on the effects of environmental activism on corporations (Dimson et al. 2015; Azar et al. 2021). Closely related to our study is Dimson et al. (2015), who study the activism of one large institutional investor with a major commitment to responsible investment. Consistent with our findings, Azar et al. (2021) demonstrate that the Big Three appear to push firms towards incremental reductions in carbon emissions.

The remainder of the paper is organized as follows. Section 2 develops our hypotheses on the determinants of and outcomes associated with ESG Pay, while Section 3 describes our data and sample. Section 4 reports the empirical findings on the determinants of ESG Pay. Section 5 analyzes the relations between ESG adopters and their capital providers. Section 6 focuses on the observed outcomes associated with the inclusion of ESG metrics in compensation contracts. We conclude in Section 7.

[5] Relatedly, Flammer et al. (2019) conclude that integrating CSR variables into executive compensation tends to improve firms' financial performance. Maas (2018) finds that quantitative, hard corporate social performance targets is an effective way to improve CSR results.

[6] These previous studies are restricted to the U.S. where we observe less frequent use of ESG Pay. Moreover, their analyses are based on a relatively small cross-section of firms (S&P100 or S&P500) and data from years prior to 2014, a period in which ESG Pay was relatively uncommon (see Figure 1).

2. Conceptual Framework and Empirical Predictions

Our empirical analysis is conceptually grounded in an agency-theoretic framework. Accordingly, executive compensation arrangements are designed to maximize shareholder value.[7] Here, the meaning of "value" extends beyond mere financial value. With regard to ESG metrics, it is plausible that the firm's stakeholders, including its owners, intrinsically care about the firm's ESG outcomes. Such intrinsic preference may reflect that many of the "E" and "S" variables in ESG pertain to activities that are subject to external costs which are not fully reflected in the prices of goods and services transacted by the firm. Greenhouse gas emissions or labor practices in foreign countries are cases in point.

Our data set allows us to partition the sample into ESG adopters and non-adopters. Companies in the latter group are the ones reporting that the set of Key Performance Indicators (KPI) they have identified for their executives is disjoint from the variables identified as ESG variables in our database. At the same time, we cannot observe whether some ESG pay adopters do so only nominally, that is, they apply low-powered incentive provisions to the ESG variables deemed KPIs. We label such arrangements "window dressing" for ESG Pay. Such nominal incorporation of ESG metrics into compensation arrangements is possible because outsiders generally do not have access to the relative weights attached to different metrics. Further, the specific measurement of ESG outcomes generally differs across companies.

We hypothesize that companies adopt real, as opposed to nominal, ESG Pay for a variety of reasons. First, shareholders and their appointed boards may intrinsically care about ESG outcomes (Bonham and Riggs-Cragun 2022). Second, ESG metrics may be viewed as informative

[7] The recent study by Bebchuk and Tallarita (2022), in contrast, approaches ESG variables in executive compensation arrangements as another convenient instrument for executives to camouflage excessive compensation in the guise of "pay-for-performance".

signals about financial performance beyond the usual financial metrics. The rationale for ESG Pay is then similar to that for the inclusion of non-financial variables, e.g., customer satisfaction or product quality, in managerial incentive contracts (Ittner et al. 1997; Dikolli 2001). Finally, ESG metrics may be informative as leading indicators of future risk exposures, such as the risk of stranded assets due to climate change. Agency models have demonstrated the contractual value of such leading indicators (Sliwka 2002; Dutta and Reichelstein 2003).

Firms may also adopt substantive ESG Pay provisions for their executives through high-powered incentive schemes because certain stakeholder groups, other than the firms' owners, intrinsically care about certain ESG outcomes. Due to the external costs associated with variables like environmental pollution or worker safety, it is plausible that an improvement in these variables will result in increased customer loyalty, stronger brand value, better labor relations, or a broader set of investment clients.

Our agency theoretic framework also makes it plausible that a sizable segment of firms will rationally choose not to tie executive compensation to ESG metrics. These are likely to be firms where the majority of shareholders subscribe to Friedman's postulate that the objective of businesses should be to maximize economic profits (Friedman 1970). Furthermore, the owners of these firms believe that pursuit of the ESG metrics popularized in recent years will diminish economic profitability, taking into consideration the possibility that pursuit of these metrics may improve the firm's standing with certain stakeholder groups.

Finally, some firms in our sample may find it preferable to adopt ESG Pay, but do so only nominally. Owners of these companies and their appointed boards of directors may engage in "window-dressing" in order for the firm to reap the benefit of being perceived as "ESG conscious" by outside stakeholders. At the same time, the firm may want to avoid high-powered incentive

provisions attached to their ESG- based KPIs because "moving the needle" on these ESG outcomes could result in adverse financial consequences.[8]

While our study cannot distinguish directly between nominal and substantive ESG Pay adopters, we gain some understanding of their relative proportion in our sample by exploring the determinants of ESG Pay and the extent to which the adoption of such compensation schemes is associated with improvements in subsequent ESG outcomes.

2.1. Determinants of ESG Pay

Industry- and Country Level Determinants. The tendency to base executive compensation on ESG metrics is plausibly higher for firms operating in industries with significant environmental impact, specifically in heavy manufacturing industries. Similarly, we expect a higher proclivity to adopt ESG Pay for firms located in countries that are either considered to be sensitive to environmental protection and/or have regulations in place that mandate corporate ESG disclosures.

Firm Fundamentals. ESG Pay could be associated with firm fundamentals in several ways. We expect firms exhibiting greater volatility to be more likely to implement ESG Pay, since for these firms ESG metrics could be informative about future performance, i.e., ESG variables are leading indicators of future financial performance. We also expect larger firms to be more likely to implement ESG Pay since the environmental and social management practices of larger firms are more visible to the public.

ESG Pledges. We predict that firms with pledges to improve ESG scores will seek to lend further credibility to these commitments by tying executive compensation to ESG metrics. A prominent example are carbon dioxide (CO_2) reduction pledges. As part of their sustainability

[8] Companies that currently choose not to adopt ESG Pay would not necessarily be better off by becoming nominal adopters, because doing so may also require that ESG performance metrics be given non-trivial compensation weights in order to avoid accusations of false disclosure. From that perspective, the decision to become an ESG Pay adopter may be interpreted as a costly but credible signal to the general public.

efforts, a sizable number of global firms have recently articulated net zero emission pledges. Accordingly, these firms have stated the goal to reduce their emissions (gross emissions less so-called offsets) to zero by 20xx, where frequently xx=50.[9] To strengthen the credibility of their net zero pledges, some firms have partnered with NGOs such as the Science-Based Target initiative (SBTi).[10] We therefore examine the association between firms becoming SBTi signatories and adopting ESG Pay.

Shareholder Pressure. Survey evidence suggests that a nontrivial number of institutional investors believe that climate risks have financial implications for their portfolio firms (Krueger et al. 2020). That said, it is plausible that a substantial number of investment fund managers may themselves be agnostic in their beliefs regarding the relationship between ESG criteria and financial performance. Yet, they may push for the adoption of ESG metrics in the executive compensation schemes of the portfolio companies for fear of losing their investment clients with an intrinsic ESG preference.[11] Indeed, recent research in finance has argued that some investment groups are willing to trade financial returns for improvements in ESG performance (Pastor et al. 2020; Riedl and Smeet 2017; Barber et al. 2021; Kruger et al. 2020).[12] Because these investment clients are frequently represented by institutional equity investors, it is plausible that a higher share of institutional ownership is associated with a higher proclivity to adopt ESG metrics in executive compensation schemes.

[9] Critics have argued that these self-imposed targets often lack credibility, as firms do not specify how they are to achieve these targets 30 years into the future (Comello et al. 2022).

[10] Launched in 2014, the *Science-Based Targets Initiative* (SBTi) seeks to define and promote net-zero carbon emission targets in line with climate science. The list of companies that have set emissions reduction targets through the SBTI is available on the Emission Pledge's web-site: https://sciencebasedtargets.org/companies-taking-action#anchor-link-test.

[11] For example, the equilibria emerging in the model of Friedman and Heinle (2016) has the feature that investors effectively exert pressure on management to improve the firms' sustainability practices.

[12] For further evidence on investors' preferences towards ESG see also Hartzmark and Sussman (2019) and Ceccarelli, Ramelli, and Wagner (2021).

In his annual letters to CEOs, BlackRock's CEO Larry Fink has been explicit that, in order for firms to be eligible portfolio companies for BlackRock, they need to be transparent about their sustainability practices.[13] Mr. Fink has also been explicit that this insistence does not reflect BlackRock being a climate activist. Instead, BlackRock's position supposedly reflects the belief that climate change poses a long-term financial risk to many corporations, in part due to impending regulatory risk, and yet these risks may not be properly reflected in current share prices.[14]

Directors' Preferences. The push/resistance to adopt ESG Pay could also relate to the composition of the board of directors. For example, it is plausible that independent directors are in favor of ESG Pay because reputational concerns make these directors sensitive to external pressure to implement ESG strategies. Moreover, based on prior literature showing that female directors are more sensitive to ESG issues (Atif et al. 2021; Ginglinger and Raskopf 2021; Liu 2018), it is possible that ESG Pay is more prevalent among firms with more female directors.[15]

2.2. ESG Outcomes Associated with ESG Pay

ESG outcomes. Since corporate carbon emissions are frequently a primary ESG metric, we expect that, in comparison to non-adopters of ESG Pay, adopters will achieve significant reductions in their levels of CO_2 emissions. We expect this relation to be particularly strong for firms that single-out carbon-based metrics among their KPIs. Similar to carbon emissions, we expect the adopters of ESG Pay to receive more favorable ratings from external agencies such as Sustainalytics or Refinitiv.

[13] The annual letter to CEOs in 2020 stated: "*we will be increasingly disposed to vote against management and board of directors when companies are not making sufficient progress on sustainability-related disclosures and the business practices and plans underlying them*" (Sprouse 2020).
[14] Generation Investment Capital is another example of an equity fund emphasizing that long-term value maximization requires management practices that are environmentally and socially sustainable (Bebb and Reichelstein 2016).
[15] See also Adams and Ferreira (2009) and Cronqvist and Yu (2017) for other research with consistent conclusions on the effect of women on corporate decision-making and, specifically, on CSR.

Pay for ESG performance. If firms merely seek to claim the "green mantle" by nominally including ESG metrics in executive compensation schemes, there should be no association between ESG performance and the cash bonuses received by the firm's executives. In contrast, we would expect to see a positive association for substantive ESG Pay adopters.

In sum, if the adoption of ESG Pay is associated with the determinants hypothesized above as well as with improvements in ESG outcomes, the findings would suggest that a significant portion of ESG Pay adopters do not engage in mere "window dressing".

3. Data, Sample, and Descriptive Statistics

3.1. Data and Sample

Our main sample includes international public firms covered by ISS Executive Compensation Analytics (ECA) from 2011 to 2020. ECA provides detailed, comparable data on incentive awards, including performance metrics, performance goals and payout structures on all incentive awards for over 9,000 companies across the U.S., Canada, U.K., Europe, Australia, New Zealand, and South Africa. Although the ECA database starts in 2008, comprehensive coverage of performance metrics used in compensation contracts is only available from 2011.[16] Our analysis ends in 2020, the last year with complete available data at the time of our study.

Aside from the ECA data on compensation contracts, our analysis incorporates separate data sources on greenhouse gas emissions, ESG ratings and institutional ownership on individual firms. Trucost, a commercial provider of corporate carbon emission data, is a widely used source of firm carbon emissions data for the corporate sector (for example, MSCI and S&P use Trucost data in their indexes) and for international organizations such as UNEP FI (i.e., the United Nations

[16] Unfortunately, the data on performance goals and payout structures is not available for many firms covered by the ECA database.

Environment Program Finance Initiative). Trucost collects carbon emissions data from publicly available sources, including the Carbon Disclosure Project.[17] When a covered firm does not publicly disclose its carbon emissions, Trucost estimates a firm's annual carbon emissions based on an environmental profiling model.

We obtain data on institutional ownership from the FactSet/LionShares database. FactSet/LionShares gathers institutional ownership for U.S. equities from mandatory filings with the SEC. For stocks traded outside the U. S., FactSet/LionShares gathers institutional ownership data from national regulatory agencies and stock exchange announcements, as well as direct disclosures of mutual funds, mutual fund industry directories, and company proxies and annual reports. We obtain accounting and market data from Datastream/WorldScope. This data set provides stock price, balance sheet, and income statement information for a large number of international firms. We collect data on commercial ESG Ratings sources from Refinitiv, Sustainalytics, and MSCI (ESG KLD Stats).

Table 1, Panel A, outlines the sample selection procedure. We start with 53,565 firm-year observations in the ECA dataset. To be included in our sample, we require that the firm is publicly traded and is covered by Datastream and FactSet/LionShares. The resulting sample consists of 35,076 firm-year observations corresponding to 6,262 firms. Some of the tests require non-missing Trucost data, which further restricts the sample size to 22,603 observations corresponding to 4,395 firms from 21 countries.

Table 1, Panel B, presents the sample composition by year. The table shows a remarkable increase in the number of firms adopting ESG Pay over the sample period, with the increase being most pronounced in the latter part of the sample. This is consistent with a substantial body of

[17] Other sources of carbon emissions data include companies' websites, annual reports (10-K), CSR reports, and direct communications with companies.

evidence of a significant increase in the social sensitivity towards ESG in these recent years (e.g., Azar et al., 2021). As shown in the table, a non-trivial number of firms have implemented ESG Pay by the end of our sample period (1,198 firms, corresponding to 31% of our sample firms in 2020).

Table 1, Panel C, presents the sample composition by country. We observe that the use of ESG Pay is more common among European countries, Australia, and Canada. The table also shows that the frequency of ESG Pay in the US is significantly lower than that in these countries. This is consistent with evidence suggesting that societies within the EU being more sensitive to ESG issues (Gibson et al. 2020).

Table 1, Panel D, presents the sample composition by industry. ESG metrics are most commonly used in the compensation contracts of producers of oil and petroleum products, utilities, and automakers. That is, ESG Pay appears to be more prevalent in industries that are environmentally controversial.

3.2 Firm, Industry, and Country Characteristics

Table 2 presents descriptive statistics of the variables used in our tests.[18] Panel A presents the summary data for the pooled sample and Panel B distinguishes between observations with and without ESG Pay. Table 2, Panel B, shows that firms with ESG Pay are larger, exhibit higher CO_2 emissions, higher ESG ratings, and are more likely to make environmental pledges.

3.3 Contract Characteristics

Table 3 presents summary data on the characteristics of compensation contracts containing ESG metrics. Panel A presents a taxonomy of the ESG metrics we observe (see Table 3 for the number of sample firms using each type of metric and Appendix B for examples of each type).

[18] Continuous variables are winsorized at the top and bottom 1%.

Most of our sample firms use metrics related to environmental dimensions. Indicators related to carbon emissions are popular but, as shown in the table, firms also use a wide range of other environmental metrics. In the "S" dimension of ESG, Table 3 also indicates that firms often use indicators related to safety, diversity and inclusion, and employee satisfaction/development. We also observe metrics related to governance, most frequently in relation to corporate culture.

Table 3, Panel A also shows that compensation contracts often include firm specific ESG scores (see also Appendix B for examples) and, to a lesser extent, scores provided by external parties (e.g., ESG ratings provided by agencies such as Refinitiv, MSCI or Sustainalytics). Clearly, the categories listed in Table 3, Panel A, are not mutually exclusive; a substantial number of executive compensation contracts include more than two metrics, presumably to capture the multidimensional nature of ESG performance.[19]

The disclosure of the use of ESG metrics in compensation contracts also varies significantly. Some companies provide a detailed description of the metrics, weights, targets, and structure of the contract (see Appendix C for an example). In contrast, other firms state that compensation is based on criteria such as "Decarbonisation and sustainability", "Equal opportunities and non-discrimination", "Strategic priorities", "Conduct and Culture", "ESG performance", but provide little detail about the pay scheme and the corresponding assessment process.

Table 3, Panel B, indicates that, while a majority of the ESG metrics are used for annual (short-term) variable compensation, these metrics are also often found in long-term incentive

[19] To have a sense of the number of ESG metrics typically used in compensation contracts, we manually count the number of metrics in the subsample of observations containing at least one environmental KPI. We focus on environmental metrics for practical purposes (conducting the hand-collection exercise for the whole sample would require a disproportionate amount of resources). We find that 276 firms use only one metric, 133 firms use two metrics, and 305 firms use more than two metrics. This suggests that the use of multiple ESG metrics is not uncommon.

plans. Finding ESG metrics in both parts of the compensation contract is also not uncommon. As shown in Table 3, Panel C, the typical weight assigned to these metrics is not negligible: the average weight is 13% in the short-term part of the contract and 16% in the long-term part of the contract.

4. Determinants of ESG Pay

We start our empirical analysis by examining the determinants of the use of ESG metrics in compensation contracts. As discussed above, these determinants likely relate to industry, country, and firm characteristics. As such, we explore cross-sectional variation at these three levels.

4.1 Industry- and Country-level Determinants

We first explore variation in the use of ESG metrics across country and industries. Table 4, Panel A, presents the results of regressing *ESG Pay* on year, industry, country, industry-year, and country-year fixed effects. *ESG Pay* equals one if the compensation contract of any of the top executives of the firm includes an ESG performance criterion, and zero otherwise.[20] As shown in the table, time, industry, and country fixed effects alone explain 4%, 16%, and 6% of the variation in *ESG Pay*, respectively. Industry-year, and country-year fixed effects explain close to 30% of the variation in *ESG Pay*. This suggests that a substantial part of the variation in *ESG Pay* is firm specific.

To explore the time, industry, and country variation in *ESG Pay*, we construct the following industry- and country-level variables. *Industry with Significant Environmental Footprint* is an

[20] To identify ESG metrics we use the data items *disclosed_metric_name*, *overall_metric_type*, and *metric_type_itemized*, which contain the description of the specific variables used by the firm as well as their classification. We focus on metrics related to "sustainability", "environmental, social, and governance", and "corporate social responsibility". The definitions of all these terms are close (Christensen et al. 2021). We also check manually the conformity of the names of the metrics with their classification by the data provider.

indicator variable for companies from transportation, utilities, steel, and oil & petroleum products. *ESG Disclosure Mandate* is defined as an indicator for companies listed in countries with mandatory ESG disclosure policies (Krueger, Sautner, Tand, and Zhong 2021). *Country ESG Sensitivity* is the value of the Environmental Performance Index (see Dyck et al. 2019 for an example of prior research using this metric).[21] Table 4, Panel A, shows that these variables are strongly associated with the use of ESG metrics in compensation contracts.

4.2. Firm-level Determinants

We next explore firm-level variation in the use of ESG metrics in compensation contracts. To test the determinants of ESG, we estimate the following model (*i* denotes firm and *t* year):

$$\begin{aligned} ESG\ Pay_{it+1} = \alpha + \beta_1 * Fundamentals_{it} + \beta_2 * ESG\ pledges_{it} \\ + \beta_3 * Shareholder\ pressure_{it} + \beta_4 * Directors\ preferences_{it} + \tau_t + \delta_k + \gamma_c + \varepsilon_{it} \end{aligned} \quad (1)$$

As before, the dependent variable *ESG Pay* equals one if the compensation contract of any of the top executives of the firm includes an ESG criterion, and zero otherwise. Based on the discussion in Section 2, we include four vectors of variables: *Fundamentals*, *ESG Pledges*, *Shareholder Pressure*, and *Directors Preferences.* The variables τ_t, δ_k, γ_c refer to year-, industry-, and country-fixed effects, respectively.

The vector *Fundamentals* contains the first group of variables that relate to firm fundamentals potentially associated with ESG-based compensation. *Log(CO_2)* is the natural logarithm of firm's direct (Scope 1) GHG emissions measured in metric tons of CO_2 equivalent.

[21] The Environmental Performance Index is developed by the Yale Center for Environmental Law (Yale University) and the Center for International Earth Science Information Network (Columbia University). The Environmental Performance Index (EPI) ranks 178 countries on 20 performance indicators in the following nine policy categories: health impacts, air quality, water and sanitation, water resources, agriculture, forests, fisheries, biodiversity and habitat, and climate and energy. These categories track performance and progress on two broad policy objectives: environmental health and ecosystem vitality. The EPI's proximity-to-target methodology facilitates cross-country comparisons among economic and regional peer groups.

Volatility is the standard deviation of stock returns measured over the year (in percentage). *Size* is the logarithm of total assets. *Log(BM)* is the logarithm of the book-to-market ratio (book value of equity divided by market value of equity). We also include two measures of past performance. *ROA* is defined as net income scaled by total assets. *Return* is computed as the stock return over the year. *Leverage* is computed as the sum of long-term debt and debt in current liabilities over the firm's total assets. *Tangibility* is the ratio of property, plant, and equipment over the firm's total assets. We include these two variables to measure credit constraints. More leveraged firms may find it difficult to finance environmental and other ESG investments. Conversely, pledgeable assets support more borrowings, which in turn allow for further investment. Finally, to control for disbursement to shareholders we include *Dividends*, measured as total amount of dividends scaled by net income.

The second group of variables, included in the vector *ESG pledges,* seeks to capture that some firms are more prone to benefit from improved ESG performance. For example, firms with higher CO_2 emissions will be able to reduce more significantly their expenses for emission permits or carbon taxes. *Emission Pledge* equals one if the firm is a signatory of the Science-Based Target Initiative, and zero otherwise. *ESG Rating* is the rating assigned to the company by Refinitiv. This rating is based on firm policies and outcomes related to ESG, and thus is a proxy for the extent to which a firm is making an effort to improve ESG performance.

The third group of variables, included in the vector *Shareholder pressure*, relates to firm-level characteristics potentially associated with the likelihood that the firm is under external pressure to implement ESG strategies. *Institutional Ownership* is the fraction of shares owned by institutional shareholders. *Controlling Shareholder* equals one if the firm is controlled by one shareholder (owning more than 50% of the shares). Firms with a controlling shareholder are less

sensitive to pressure from shareholders. *Pct Peer ESG Pay* is the percentage of industry peers that have ESG Pay in that year. We include this variable based on earlier work showing substantial peer effects in corporate social responsibility (Cao et al. 2019).

The fourth group of variables, *Directors Preferences* includes board characteristics that relate to directors' preferences for ESG. *Pct Independent* is the percentage of independent directors on the board. *Pct Female* is the percentage of female directors.

Finally, we include *Abnormal Compensation*, defined as the total compensation of the CEO minus the median CEO compensation among industry peers. We include this variable to explore the possibility that the inclusion of ESG metrics in compensation contracts could be yet another way to disguise excessive managerial compensation (Bebchuk and Tallarita 2022).

Table 4, Panel B, presents our findings on the determinants of ESG-based pay. The results show that larger firms are more likely to link pay to ESG criteria. This is consistent with ESG strategies being more costly for smaller firms, but the association with size is also consistent with larger firms having more visibility and thus being more likely to be the target of ESG activism and/or regulatory pressure. The results for Model 1 also show that the use of ESG metrics is more common among firms with lower accounting profitability and among firms that are less likely to be financially constrained, i.e., firms with lower leverage and a smaller volume of collateralizable assets.

The coefficient on *Log(CO_2)* is positive and significant. This suggests that, controlling for industry, country, year, and firm fundamentals, higher carbon emitters tend to be more likely to base compensation on ESG performance. This result is particularly important in light of the concern emerging from earlier studies that high carbon emitters have been more reluctant to make carbon reduction commitments (Bolton and Kacperczyk 2021). Also consistent with the

hypothesis that the benefits from ESG Pay are more significant for firms with explicit ESG strategies, Table 4, Panel B, shows that firms with environmental pledges and higher ESG ratings are more likely to base compensation contracts on ESG criteria.[22]

Table 4, Panel B, also provides further evidence that firms adopting ESG Pay are more likely to do so in response to external pressure. We find a strong association between ESG and the percentage of institutional ownership. To gauge the magnitude of the effect of institutional shareholders, we compute the marginal effects from re-estimating equation (1) using a logit model (see Table OA1 in the online appendix). The marginal effect of one standard deviation in *Institutional ownership* ranges from 4% to 8% (the within-firm standard deviation of *Institutional ownership* is 0.05).

Our results also indicate that ESG metrics are less common among firms with a controlling shareholder. One potential explanation here is that dispersed ESG-sensitive shareholders hold a lower percentage of shares and therefore are less influential. Also consistent with the notion that firms implement ESG Pay partly due to external pressure, we find an empirical association between the inclusion of ESG metrics and the percentage of industry peers that implement this practice.

Regarding board characteristics, we find that linking pay to ESG metrics is more common among firms with more independent directors and female directors. The former result could be due to independent directors' reputational concerns. The latter result is consistent with prior literature documenting that, in comparison to men, women are more inclined to address environmental and social issues (e.g., Atif et al. 2021; Liu 2018).

[22] Table 4 uses the ESG ratings from Refinitiv. We repeat the analysis for the ESG ratings from Sustainalytics and KLD (MSCI). While data on these other two ratings are missing for a substantial number of our sample observations, we obtain the same inferences. The coefficients on *ESG Rating (Sustainalytics)* and *ESG Rating (KLD)* are positive. The t-statistics are, respectively, 8.96 and 1.42.

Column 5 of Table 4 Panel B presents the results of including all the previous right-hand side variables in the specification. Except for *Leverage*, all the previously discussed patterns remain statistically significant in the extended specification. This test also shows that ESG Pay is not related to abnormal levels of CEO compensation, which is not consistent with the notion that ESG Pay is yet another way to overcompensate the CEO.[23]

As an extension of our analysis of the determinants of ESG Pay, we conduct an instrumental variables analysis on the association between this pay practice and institutional ownership. Online Appendix (section OA.3) presents the details of the two-stage least squares (2SLS) estimation of the association between ESG Pay and foreign institutional ownership instrumented by MSCI membership. As shown in Table OA.3, we obtain the same inference as in Table 4.

5. Interactions with Capital Providers

As a further step in the characterization of ESG Pay adopters, we next study variations in the relations between firms and their capital providers, contingent on the firm adopting ESG Pay. Specifically, we analyze whether ESG Pay adopters differ from other firms in terms of shareholders' engagement, voting, and trading. Regarding creditors, we explore whether ESG Pay adopters differ from other firms in terms of using ESG-based debt instruments.

[23] One potential concern about Table 4 is that US firms are overrepresented in the sample, which could affect our inferences (US firms have on average different characteristics from international firms). In Table OA.2 we repeat the analysis of Table 4 restricting the subsample of US firms to the constituents of S&P 500 index. This restriction makes the subsample of US firms more comparable to other sample firms, as ISS ECA's coverage is mainly based on major indexes (for example, in Europe ISS ECA covers constituents the STOXX 600 and the main stock index of each country). As shown in Table OA.2, we obtain the same inferences.

5.1. Engagements by Institutional Investors

We first examine the engagements of institutional investors with their portfolio firms. To keep the analysis tractable, we focus on the three largest asset managers, BlackRock, Vanguard, and State Street, often referred to as the "Big Three", for several reasons. These firms recently started to disclose investment stewardship reports (ISR), reporting on private engagements with their portfolio firms.[24] Collecting this data for all investment funds represented in our sample would be prohibitively costly. Finally, studying the Big Three is in and of itself interesting in light of the recent debate on the influence of these investment groups (e.g., Bebchuk and Hirst 2019; Azar et al. 2021).

We hand collect engagement information from the recent ISRs published by the Big Three. We disregard engagements by letters and include only comprehensive engagements via calls and in-person meetings. The length of the period covered by the ISRs exhibits some variation across the three investors. BlackRock's ISRs include engagements data from 7/1/2017 to 6/30/2020. Vanguard's ISRs include engagements data from 7/1/2018 to 6/30/2020. State Street's ISRs include engagements data from 1/1/2014 to 12/31/2020. Vanguard and State Street classify engagements into broad categories and report reasons for the engagements. BlackRock simply publishes a list of firms contacted for comprehensive engagement.[25]

[24] According to the narrative in the investment stewardship reports (ISRs), most engagements go beyond sending a letter to the firm. For example, BlackRock's ISR states that the fund's investment stewardship department had "substantive dialogue with the companies listed as engaged firms." The ISR also states that the fund "engages companies for the following reasons: (1) to ensure that BlackRock can make well-informed voting decisions; (2) to explain its voting and governance guidelines; (3) to convey its thinking on long-term value creation and sound governance practices."

[25] In absolute terms, we observe that, during the period covered by the ISR reports, the Big Three engage with a relatively large number of firms; BlackRock engaged with 3,102 firms, State Street engaged with 2,376 firms, and Vanguard engaged with 1,301 firms. In relative terms, however, the Big Three appear to engage with a relatively small percentage of their portfolio firms: BlackRock, Vanguard, and State Street annually engage with 9%, 3%, and 5% of their portfolio firms, respectively.

We conduct a multivariate test on whether the probability that a firm includes ESG metrics in its executive compensation contracts is higher when the firm is engaged by the Big Three. That is, we regress *ESG Pay* on *Engagement by at least one Big Three.* This indicator variable equals one if the firm is included in the list of engagements disclosed in the ISR of at least one Big Three institution (Blackrock, State Street, or Vanguard). We also repeat the analysis replacing *Engagement by at least one Big Three* with equivalent variables specific to each of the three asset management companies.[26] The corresponding three variables are labelled as *Engagement by Black Rock*, *Engagement by State Street*, and *Engagement by Vanguard*, respectively. The specification also includes a vector of controls for firm characteristics: *Size*, *Log(BM)*, *ROA*, *Leverage*, *Tangibility*, *Dividends* and *Return*, all of them as previously defined (see Appendix A for variable definitions).

Table 5 presents the results of estimating OLS regressions based on the above variables. The coefficient on *Engagement by at least one Big Three* is positive and statistically significant. The coefficients on the fund-specific variables *Engagement by Black Rock*, *Engagement by State Street*, and *Engagement by Vanguard* are also positive and significant except for the case of Vanguard. In sum, the results in Table 5 indicate that the inclusion of ESG metrics in compensation contracts is more frequent among firms that are engaged by the Big Three. This is consistent with our inferences from prior tests that institutional investors play a significant role in the adoption of this compensation practice.

[26] The classification of engagements across the Big Three is not homogeneous. Vanguard includes engagements on environmental issues in the "oversight of strategy and risks" category. State Street includes engagements on environmental issues in the "Environmental/Social" category. While Blackrock does not classify engagements into categories, environmental issues are a commonly included in the agenda of Blackrock's engagements with portfolio companies (e.g., BlackRock 2019).

5.2. Shareholder Voting

Next, we analyze whether ESG Pay is associated with higher voting support at director elections and compensation-related proposals. To that end, we estimate the following model at the firm level:

$$Voting\_Support_{it} = \alpha + \beta_1 * ESG\ Pay_{it} + \gamma * Controls_{it} + \tau_t + \delta_i + \varepsilon_{it} \quad (2)$$

where *Voting_Support* is the percentage of support votes casted for each of the two voting items (i.e., director elections and compensation-related proposals) at the annual meeting of firm *i* in year *t*. *ESG Pay* is as previously defined. *Controls* includes *Size*, *Log(BM)*, *ROA*, *Leverage*, *Tangibility*, *Dividends* and *Return*, (see Appendix A for variable definitions).

Table 6, columns (1) and (2), shows a positive association between ESG Pay and voting support, for both director elections and compensation-related proposals. These results support the notion that ESG Pay is viewed favorably by shareholders. Consistently, columns (3) and (4) document that ISS (a major proxy advisory firm) is more likely to issue a positive voting recommendation on director elections and compensation-related proposals if the firm adopts ESG Pay. In section OA.4 of the Online Appendix, we analyze the voting decisions by the Big Three. Consistent with the evidence on engagements by the Big Three in the previous section, ESG Pay is associated with higher support by these large investors (see Table OA.4).

5.3. Trading by Institutional Investors

Even if they are not the target of direct engagements, firms could also implement ESG Pay to attract and/or retain institutional investment. This is consistent with prior literature documenting that institutional investors influence firms not only through direct engagements, but also through trading decisions (e.g., Admati and Pfleiderer 2009). We next explore this possibility by testing

whether ESG Pay is associated with changes in institutional investors' ownership in the firm. Focusing on investment funds, we estimate the following model at the firm-fund-year level:

$$\Delta\, Fund\_Ownership_{ift} = \alpha + \beta * ESG\ Pay_{it} + \gamma * Controls_{it-1} + \tau_i + \delta_{ft} + \varepsilon_{ift} \quad (3)$$

The dependent variable, $\Delta\_Fund\_Ownership_{ift}$, is defined as the fractional change in the number of shares of firm *i* owned by fund *f* in year *t*. $ESG\ Pay_{it}$ and $Controls_{it}$ are as previously defined for firm *i* in year *t*. Equation (3) includes firm fixed effects to capture time variation in *ESG Pay.* The model also incorporates fund-year fixed effects to control for time-variant fund characteristics such as capital inflows. As shown in Table 7, the coefficient on *ESG Pay* is positive and statistically significant. This suggests that investment funds are more likely to increase their stake in firms that implement ESG Pay.[27]

5.4. Creditors

To complete our analysis of firms' interactions with capital providers, we analyze whether ESG Pay adopters are more likely to issue ESG-based debt instruments. We study four types of such instruments: (i) "green" loans, (ii) ESG-linked loans, (iii) "green" bonds, and (iv) ESG-linked bonds. "Green" loans/bonds are issued for projects with an environmental focus. "ESG-linked" loans/bonds do not have any specific purpose but have contractual terms (e.g., interest rate, coupon) that depend on specific ESG conditions (e.g., environmental covenants). We obtain data on these debt instruments from Bloomberg and Refinitiv DealScan (see Kölbel and Lambillon

[27] In Table OA5 (Online Appendix) we analyze whether ESG pay explains investor behavior beyond the ESG ratings and emissions, we repeat the analysis including two additional control variables: *ESG Rating* (i.e., the ESG rating of firm *i* in year *t* and *Δ CO2* (i.e., the fractional change in scope 1 CO2 emissions in year *t*). The coefficient on *ESG Pay* remains positive and statistically significant.

(2022) and Kim et al. (2022) for a detailed description of this data). We estimate the following model:[28]

$$ESG\ Debt\ Instrument_{it+1} = \alpha + \beta_1 * ESG\ Pay_{it} + \gamma * Controls_{it} + \tau_t + \delta_i + \varepsilon_{it} \quad (4)$$

ESG Debt Instrument is one of the following variables. *Green Loan* is an indicator for whether the company takes a green loan in that year. *ESG-linked Loan* is an indicator variable for whether the company takes an ESG-linked loan in that year. *Green Bonds*, an indicator variable for whether the company issues green bonds in that year. *ESG-linked Bonds* is an indicator variable for whether the company issues an ESG-linked bond in that year. *ESG Pay* and *Controls* are as previously defined (equation 2).

Table 8 provides evidence that ESG Pay is associated with the use of green bonds, ESG-linked loans and ESG-linked bonds, suggesting that ESG Pay adopters seek alignment between compensation contracts and debt instruments.

6. Economic Outcomes Associated with ESG Pay

Our final tests examine the association between the decision to adopt ESG Pay and several economic outcome variables, in particular ESG performance and financial performance.

6.1 ESG Performance

We first analyze whether improvements in ESG outcomes are associated with the decision to adopt ESG Pay. While descriptive, such an association would be consistent with the notion that ESG Pay, possibly in combination with other corporate and regulatory actions, motivates improvements in ESG performance.

[28] See Amiram et al. (2021), Choy et al. (2021), and Flammer (2021) for a more detailed description of the features of ESG debt instruments.

6.1.1. Carbon Emissions

We start by testing whether the inclusion of ESG metrics among a firm's KPIs is associated with reductions in the firm's carbon emissions. To that end, we estimate the following model:

$$\Delta\ CO2_{it} = \alpha + \beta_1 * ESG\ Pay_{it} + \gamma\ * Controls_{it} + \tau_t + \delta_i + \varepsilon_{it} \quad (5)$$

where $\Delta\ CO2$ is the change in the firm's carbon dioxide emissions, measured in metric tons of CO_2 (scope 1) with respect to the previous year (i.e., from *t*-1 to *t*). We focus on scope 1 emissions because these are directly emitted by the firm.[29] *ESG Pay* and *Controls* are as previously defined (equation 2). We also repeat the analysis replacing *ESG Pay* with indicator variables corresponding to the classification of ESG metrics in Table 3: *Carbon emissions, Other environmental variables, Safety and security, Diversity and inclusion, Employee satisfaction and development,* and *Governance and corporate culture.* As before, sub-indexes *i* and *t* refer to firm *i* and year *t*, respectively. All independent variables are measured at the start of the year. τ_t and δ_i denote year and firm-fixed effects, respectively.

Table 9, Panel A, presents the results of this test. While the coefficient on *ESG Pay* is not statistically significant, when we distinguish between emission-specific KPIs and other metrics, the coefficient on *Carbon emissions* is negative and significant, which is consistent with the notion that introducing emission-specific KPIs in top executive compensation contracts induces a decrease in emissions. It is of course possible that part of the reduction effect materializes in the long-term and therefore is not captured by our empirical tests.[30]

[29] The GHG Protocol proposes a breakdown of the total amount of GHG emissions into three "scopes" based on the source of emission. "Scope 1" emissions relate to direct GHG emissions from sources that are owned or controlled by the company. "Scope 2" emissions relate to indirect GHG emissions from the consumption of purchased electricity, steam, or other sources of energy generated upstream from a company's direct operations. "Scope 3" emissions are the consequence of the firm's activities but occur from sources not owned or controlled by the company, for example employee business travel, outsourced business activities, and other parts of the supply chain.

[30] Recalling our finding above that ESG disclosure mandates tend to make the adoption of ESG pay more likely, the results obtained for equation (5) are consistent with earlier findings that firms located in countries with mandatory carbon reporting achieve incrementally lower carbon emissions (Grewal 2021; Downar et al. 2021).

6.1.2. ESG Ratings

We next repeat the previous test replacing the dependent variable in equation (5), *Δ CO2*, with *Δ ESG Rating*, defined as the change in ESG ratings with respect to the previous year. We use the ESG ratings provided by three major vendors: Refinitiv, Sustainalytics, and KLD. The coverage of these two latter ratings is substantially lower than Refinitiv, which causes sample attrition.[31] Table 9, Panel B, presents the results of these additional tests. When using *Δ ESG Rating* as the dependent variable, the coefficient on *ESG Pay* is positive and significant for two of the ratings, suggesting that ESG Pay is followed by an increase in ESG ratings. Finding that the result differs somewhat for the three ratings is perhaps not surprising given that prior literature documents a significant divergence across these metrics, including their coverage (e.g., Berg et al. 2020). In Online Appendix (Table OA.6) we also explore the relation between the types of ESG metrics in Table 3 and changes in the corresponding components of Refinitiv's ESG rating. We find that, in general, there is a positive and significant association.

Table 10 repeats the analysis splitting the sample by geographic area. The results are somewhat more pronounced in Europe. Consistent with the notion that European countries are more sensitive towards ESG issues, these countries exhibit higher values of *Country ESG sensitivity* and *ESG Disclosure Mandate*, namely the measures used in prior sections to capture regulatory and social pressure to improve ESG performance.

6.2. Financial Performance

For completeness, we also explore whether ESG Pay is associated with financial performance. We repeat the analysis replacing the dependent variable in equation (5), Δ *CO2*, with

[31] Beyond having a smaller coverage of our sample firms, KLD ratings are only readily available until 2018.

Δ *ROA*, namely the change in ROA (i.e., return on assets) with respect to the previous year. ROA is computed as net income scaled by total assets.

Table 11 presents the results of this test. As shown in the table, the coefficient on *ESG Pay* is statistically insignificant, suggesting that adding ESG metrics to compensation contracts is not significantly associated with a change in accounting profitability, at least in the short term. When we distinguish between various categories of ESG metrics, we find some negative relation with the use of carbon-specific metrics. Table 11, Columns (3) and (4), repeats the previous test using the annual *Return* as the dependent variable. Interestingly, the coefficient on *ESG Pay* is negative and marginally significant. When we look at the categories of ESG metrics we find that the coefficient on *Carbon emissions* is negative and significant.

The findings in in Table 11 allow for multiple interpretations. The evidence is consistent with the idea that an emphasis on ESG (particularly in the environmental dimension) may not be beneficial for shareholder wealth in the short term. As stated above, some investor groups may not mind such a tradeoff because of the external costs associated with some ESG metrics. At the same time, lower financial performance in the short term does not necessarily imply a destruction of shareholder value, as superior ESG performance could yield long-term benefits for shareholders that are not fully captured by accounting earnings or/and by stock prices.

6.3. Pay for ESG Performance

Finally, we explore the association between ESG performance and executive pay. Our interest here is in seeing whether this association differs for the subsample of ESG Pay adopters in comparison to those firms that do not include ESG metrics among their KPIs. Table OA.7 tests the time-series association between cash compensation (defined as the logarithm of the sum of annual salary and cash bonus) and ESG performance (i.e., carbon emissions and ESG ratings). We

find some evidence of "pay for ESG performance" in firms with ESG Pay; cash compensation is negatively (positively) associated with emissions (ESG ratings). In contrast, no such association exists for firms that do not adopt ESG Pay.[32] While the results in Table OA.7 are consistent with the notion that ESG Pay provides incentives to increase ESG performance, the magnitude of the effect is small (for example, a 1% decrease in emissions is associated with an increase in cash compensation of around 5 basis points).[33]

7. Concluding Remarks

The number of firms around the world that view ESG metrics as KPIs for their executives is growing rapidly. Relying on an international data set, this study has examined both the factors that favor the adoption of ESG Pay and the economic outcomes that emerge from implementing such compensation plans. Our study thereby provides further insights as to which firms embrace ESG metrics and which firms actually "walk the talk" in terms of incentivizing their top executives on the basis of ESG metrics.

Among the determinants of ESG Pay, we identify several macro-level factors that predict a firm's tendency to include ESG metrics among its KPIs. Aside from operating in an industry with significant environmental footprint, these factors include geographic location as it relates to countries that mandate ESG disclosures and implement stronger environmental regulations. In terms of firm fundamentals, we find that ESG Pay is more common among larger firms subject to higher volatility. Beyond firm fundamentals, our findings show that the proclivity to implement

[32] In the Online Appendix we analyze the association between ESG Pay and the weights assigned to other performance measures in the compensation contract. In the time-series, we observe a positive association between the use of ESG metrics and the weight of financial performance metrics. In contrast, we observe a negative association between the use of ESG performance metrics and the weight of other non-financial performance metrics (see Table OA.8).

[33] We obtain similar but insignificant results when we regress changes in compensation in changes in ESG performance. The small sensitivity of pay to ESG performance in our tests could also be partially driven by the limitations of our data; our right-hand side variables are proxies for ESG performance and we only have ten years of data.

ESG Pay increases with existing public commitments to reduce carbon emissions, the level of institutional ownership, and certain board characteristics.

We find that the adoption of ESG Pay is frequently preceded by shareholder engagement. Adoption of ESG Pay is also associated with higher voting support and accompanied by increases in holdings by institutional investors. Further, ESG Pay adopters are more likely than other firms to use ESG-based debt instruments. Our analysis of different outcome variables associated with ESG Pay shows that ESG Pay adopters tend to improve along some dimensions ESG performance.

Taken together, our empirical findings are consistent with a principal-agent perspective postulating that executive compensation schemes are designed to maximize firm value from a shareholder perspective. Institutional investors, in particular the Big Three, have been explicit regarding their preference for firms to pursue management objectives that, in addition to pure financial criteria, address ESG variables. Our findings on the role of institutional investors in adopting ESG pay provides evidence that the intrinsic preferences of these equity holders, as well as prospective future equity investors, is increasingly reflected in the executive compensation schemes of the portfolio companies.

Our findings give no indication that the adoption of ESG Pay primarily amounts to window-dressing insofar as boards of directors nominally identify ESG metrics without substantive backing in the actual performance assessment and compensation process.

The inferences from our study are limited by the purely descriptive nature of our empirical analysis. A better understanding of the effects of ESG metrics in executive compensation schemes is likely to emerge from knowledge regarding the structure of the executive compensation contracts. Specifically, it would be valuable for future research to have further access to the

specific compensation vehicles, the relative weights attached to difference performance metrics and the use of discretionary bonus rules.

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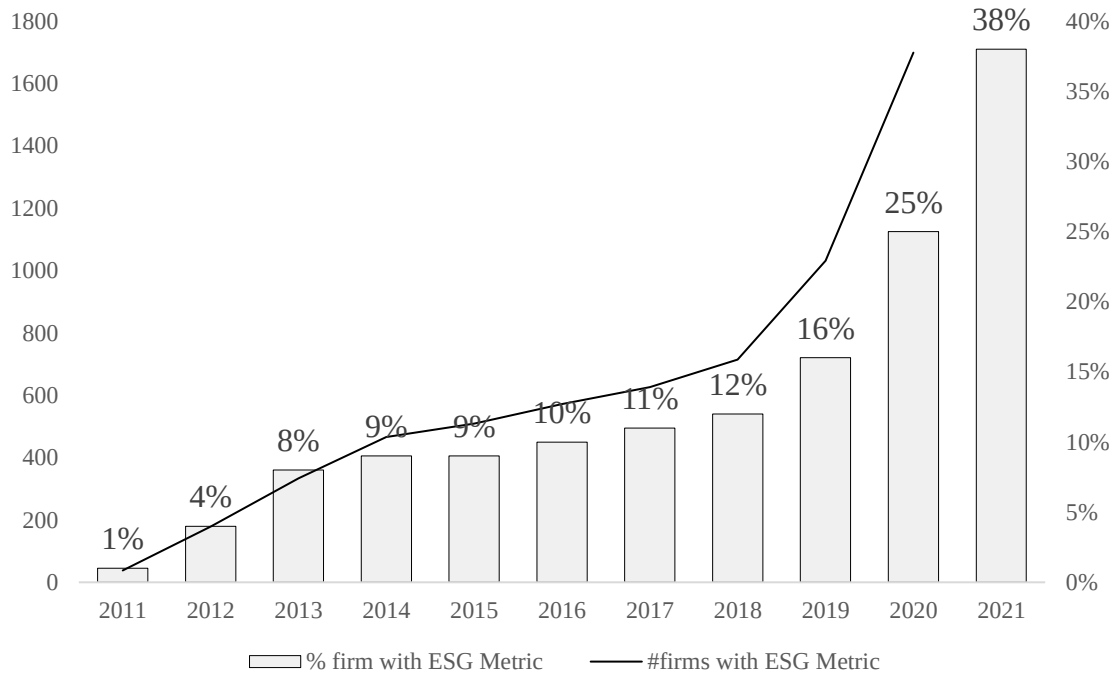
Figure 1. Use of ESG Metrics in Executive Compensation

This figure shows the evolution of ESG pay (i.e., the inclusion of ESG metrics in executive compensation contracts) over our sample period. The data includes all firms covered by ISS Executive Compensation Analytics (ECA) from 2011 to 2021 (10,061 firms). The bars represent the percentage of firms that include ESG performance metrics in their executive compensation contracts in a given sample year (right axis). The solid line represent the number of firms that include ESG performance metrics in their executive compensation contracts in a given sample year (left axis).



Note: The data corresponding to the year 2021 is not complete. At the time of writing this paper ISS ECA had gathered compensation information corresponding to the year 2021 for 3,065 firms.

Appendix A. Variable definitions

ESG Pay	Indicator variable that equals one if the company incorporates any ESG criterion in executive compensation contracts in that year, and zero otherwise.
Size	Logarithm of the firm's total assets (expressed in millions of USD).
BM	Logarithm of the book value of common equity scaled by the market value of equity.
ROA	Net income scaled by total assets.
Leverage	Total debt scaled by total assets. Total debt is the sum of long-term debt and the debt in current liabilities.
Tangibility	Property, Plant and Equipment scaled by total assets.
Dividends	Total amount of dividends scaled by Net income
Return	Stock return of the firm compounded over the year (expressed as a fraction of the past market value)
Volatility	Standard deviation of the stock returns measured over the year, expressed in percentage.
Log(CO2)	Logarithm of the firm's direct GHG emissions measured in equivalents of metric tons of CO_2
Institutional ownership	Fraction of the firm's equity owned by institutional investors
Foreign IO	Fraction of holdings of all institutions domiciled in a country different from the one in which the stock is listed.
Controlling shareholder	Indicator variable that equals one if company's insiders own more than 50% of the firm's outstanding equity, and zero otherwise.
Industry with Significant Environmental Footprint	Indicator variable for companies from transportation, utilities, steel, and oil & petroleum products
ESG Disclosure mandate	Indicator variable that equals one if a company's headquarters is in the country with mandatory ESG disclosure polices, and zero otherwise.
Country ESG sensitivity	Country-specific Environmental Performance Index (EPI) developed by the Yale Center for Environmental Law (Yale University) and the Center for International Earth Science Information Network (Columbia University). The EPI is measured biennially for 180 countries using 32 performance indicators across 11 issue categories that measure environmental health and ecosystem vitality.
Emission Pledge	Indicator variable that equals one if a company has set emissions reduction targets through the "Science-based Targets Initiative", and zero otherwise.
ESG Rating (Refinitiv)	Refinitiv's ESG Score is an overall company score (from 0 to 1) based on the self-reported information in the environmental, social and corporate governance pillars.
ESG Score (Sustainalytics)	Sustainalytics' measure of ESG preparedness and performance that takes value from 0 to 100. A higher score indicates better ESG Performance.
ESG Score (KLD)	Score obtained from MSCI's KLD database, obtained by computing the number of "strengths" and subtracting from this the number of "weaknesses" identified by KLD as related to the firm's overall corporate social responsibility. A higher score indicates better ESG Performance.

Carbon emissions	Indicator variable that equals one if the company incorporates specific GHG emission metrics in executive compensation contracts, and zero otherwise.
Other environmental variables	Indicator variable that equals one if the company incorporates an environmental ESG metric in executive compensation contracts that is not specific to GHG emissions, and zero otherwise.
Safety and security	Indicator variable that equals one if the company incorporates an ESG metric in executive compensation contracts that is related to workplace safety, and zero otherwise.
Diversity and inclusion	Indicator variable that equals one if the company incorporates an ESG metric in executive compensation contracts that aims to promote gender and ethnic diversity, and zero otherwise.
Employee satisfaction and development	Indicator variable that equals one if the company incorporates an ESG metric in executive compensation contracts that is related to workforce training and employee satisfaction, and zero otherwise.
Governance and corporate culture	Indicator variable that equals one if the company incorporates an ESG metric in executive compensation contracts that is related to governance, corporate mission, culture and ethics, and zero otherwise.
Pct Independent	Percentage of independent board members as reported by the company.
Pct Female	Percentage of female directors on the board.
Pct Peer ESG Pay	Percentage of the company's industry peers that include ESG metrics in their compensation contracts (industry affiliation is defined based on the Fama-French 48 industry classification).
Abnormal Compensation	Total compensation of the CEO as disclosed by the company minus the median ECO compensation of industry peers (expressed in USD)
Engagement by Black Rock	Indicator variable that equals one if BlackRock engages with the firm from July 1, 2017 until June 30, 2020, and zero otherwise. The data includes all engagements.
Engagement by State Street	Indicator variable that equals one if State Street Global Advisors engages with the firm from January 1, 2014 until December 31, 2020, and zero otherwise. The data includes engagements about Environmental/Social issues.
Engagement by Vanguard	Indicator variable that equals one if Vanguard engages with the firm from July 1, 2018 until June 30, 2020, and zero otherwise. The data includes engagements about "Oversight of strategy and risk" (which include environmental issues).
Engagement by at least one Big Three	Indicator variable that equals one if BlackRock, State Street, or Vanguard engage with the firm, and zero otherwise.

Appendix B. Examples of ESG metrics

This table provides examples of various ESG metrics used in the compensation contracts of our sample firms, as described in the ISS ECA database. The examples follow the taxonomy defined in Table 3.

Type of ESG metric	Examples	Company
a) Specific indicators:		
Carbon emissions	Greenhouse gas emissions intensity at gold producing operations measured in kg CO2e/tonne	AngloGold Ashanti Ltd. (2020)
Other environmental variables	Wastewater compliance percentage	Essential Utilities Inc. (2019)
Safety and security	Days Away/Restricted or Transfer (DART) incident rate per 100 full-time employees	New Jersey Resources Corporation (2019)
Diversity and inclusion	Percentage of women among the SMP (Senior Management Position)	BNP Paribas SA (2020)
Employee satisfaction and development	Internal promotion rate in global leadership	Adecco Group AG (2020)
Governance and corporate culture	Colleague Culture & Engagement survey	Lloyds Banking Group Plc (2020)
b) Scores:		
Self evaluation (i.e., scores defined and measured by the firm)	Combination of 3 criteria: (1) Diversity and equal opportunities; (2) Strengthen our People and the Digital Transformation of the Company; (3) Ethics and Good Governance.	Enagas SA (2020)
External evaluation (i.e., scores defined and measured by external parties)	Inclusion over the three-year period 2020-2022 in the DJSI, FTSE4GOOD, and CDP Climate Change	Italgas SpA (2020)
	Bloomberg ESG disclosure score	Newmont Corporation (2020)
	MSCI ESG rating	Standard Bank Group Ltd. (2020)
	"Great Place to Work Trust" Index	Admiral Group Plc. (2021)
	Maintain citation in Bloomberg "Gender-Equality Index"	Scentre Group (2021)

Appendix C. Example of firm disclosure about ESG Pay

This table provides examples of the disclosure of ESG metrics in compensation contracts. The disclosure is an excerpt of the description of the compensation package of the CEO of Schneider Electric, as disclosed in the firm's 2020 public filings.

Panel A. Annual incentives

40% Group organic sales growth markets
30% Adjusted EBITA margin (organic) improvement
10% Group cash conversion rate
20% Schneider Sustainability Impact, defined as follows:

Schneider Sustainability Impact 2018-2020

Megatrends and SDGs	2018-2020 programs	2018 results	2019 results	2020 results
Climate	1. 80% renewable electricity	30%	50%	**80% ▲**
	2. 10% CO_2 efficiency in transportation	-1.8%	4.1%	**8.4% ▲**
	3. 120 million metric tons CO_2 saved on our customers' end thanks to EcoStruxure™ offers	51	89	**134 ▲**
	4. 25% increase in turnover for our EcoStruxure™ Energy and Sustainability Services	13.8%	23.8%	**17.6% ▲**
Circular economy	5. 75% sales under our new Green Premium™ program	45.7%	55.2%	**76.7% ▲**
	6. 200 sites labeled Towards Zero Waste to Landfill	178	193	**206 ▲**
	7. 100% cardboard and pallets for transport packing from recycled or certified sources	62%	96%	**99% ▲**
	8. 120,000 metric tons of avoided primary resource consumption through ECOFIT™, recycling, and take-back programs	43,572	97,439	**157,588 ▲**
Health & equity	9. 70% scored in our Employee Engagement Index	67%	64%	**69% ▲**
	10. 0.88 medical incidents per million hours worked	0.94	0.79	**0.58 ▲**
	11. 90% employees have access to a comprehensive well-being at work program	20%	47%	**90% ▲**
	12. 100% employees are working in countries that have fully deployed our Family Leave Policy	75%	99%	**100% ▲**
	13. 100% workers received at least 15 hours of learning (11.25 in 2020), and 30% of workers' learning hours are done digitally	57%	62%	**90% ▲**
	14. 90% white-collar workers have individual development plans	78%	79%	**92% ▲**
	15. 95% employees are working in a country with commitment and process in place to achieve gender pay equity	92%	99%	**99.6% ▲**
Ethics	16. +5.5pts increase in average score of ISO 26000 assessment for our strategic suppliers	+1.8	+3.7	**+6.3pts ▲**
	17. 350 suppliers under human rights and environment vigilance received specific on-site assessment	155	279	**374 ▲**
	18. 100% sales, procurement, and finance employees trained every year on anti-corruption	69%	94%	**94% ▲**
Development	19. x4 turnover of our Access to Energy program	x1.31	x1.56	**x1.64 ▲**
	20. 400,000 underprivileged people trained in energy management	196,162	246,268	**281,737 ▲**
	21. 15,000 volunteering days thanks to our VolunteerIn global platform	5,691	11,421	**18,469 ▲**

Source: Schneider Electric's 2020 Integrated Report.

Appendix C. Example of firm disclosures about ESG Pay (cont'ed)

Panel B. Long-term incentives

Metric	Weight	Description
Improvement of Adjusted Earnings Per Share (EPS)	40%	Average of the annual rates of achievement of Adjusted EPS improvement targets for the 2020 to 2022 fiscal years. Adjusted EPS performance is published in the external financial communications and its annual variance will be calculated using adjusted EBITA at constant FX from year N-1 to year N.
Relative TSR (benchmark: CAC 40)	17.5%	0% below median; 50% at median (rank 20); 100% at rank 10; 120% at ranks 1 to 4
Relative TSR (benchmark: 11 peer firms)	17.5%	0% at rank 8 and below; 100% at rank 4; 150% at ranks 1 to 3
DJSIW	**6.25%**	**0%: not in World; 50%: included in World; 100%: sector leader**
Euronext Vigeo	**6.25%**	**0%: out; 50%: included in World 120 or Europe 120; 100%: included in World 120 & Europe 120**
FTSE4GOOD	**6.25%**	**0%: out; 50%: included in Developed or Environmental Leaders Europe 40 indexes; 100%: included in Developed & Environmental Leaders Europe 40 indexes**
CDP Climate Change	**6.25%**	**0%: C score; 50%: B score (25% at B-); 100%: A score (75% at A-)**

Source: Schneider Electric's 2020 compensation report.

Table 1. Sample Composition by Year, Country, and Industry

This table reports descriptive statistics for the sample used in our tests. The sample spans from 2011 to 2020 and includes 22,603 firm-year observations. Panel A describes the procedure to construct our sample. Panel B presents summary statistics by year. Panel C presents summary statistics by country. Panel D presents summary statistics by industry affiliation.

Panel A. Sample construction

Sample observations	# Firm-Years	# Distinct Firms
Observations in ISS ECA database from 2011 to 2020	53,565	9,635
Observations with non-missing accounting and market data	38,876	7,014
Observations with non-missing institutional ownership information	35,076	6,262
Observations with non-missing Trucost data	22,603	4,395

Panel B. Sample distribution by year

Country	# obs.	# firms using ESG metric	% firms using ESG metric
2011	887	21	2.37%
2012	1,281	72	5.62%
2013	1,411	140	9.92%
2014	1,625	189	11.63%
2015	1,805	233	12.91%
2016	1,859	276	14.85%
2017	3,107	407	13.10%
2018	3,244	489	15.07%
2019	3,549	715	20.15%
2020	3,835	1,198	31.24%

Panel C. Sample distribution by country

Country	# obs.	# firms	# firms using ESG metric	% firms using ESG metric
Australia	1,675	337	184	54.60%
Austria	150	33	19	57.58%
Belgium	152	25	16	64.00%
Canada	1,716	319	168	52.66%
Denmark	159	37	8	21.62%
Finland	216	45	10	22.22%
France	1,195	192	114	59.38%
Germany	907	167	100	59.88%
Great Britain	2,65	390	172	44.10%
Greece	35	16	8	50.00%
Ireland	72	15	3	20.00%
Italy	423	84	51	60.71%
Netherlands	381	57	35	61.40%
New Zealand	68	19	6	31.58%
Norway	192	49	14	28.57%
Portugal	76	15	10	66.67%
South Africa	77	69	39	56.52%
Spain	288	48	24	50.00%
Sweden	598	132	22	16.67%

Switzerland	398	103	32	31.07%
U.S.	11,175	2,243	370	16.50%

Panel D. Sample distribution by industry

Industry	# obs.	# firms	# firms using ESG metrics	% firms using ESG metrics
Agriculture	103	26	3	11.54%
Food Products	425	80	19	23.75%
Candy & Soda	107	19	6	31.58%
Beer & Liquor	138	22	5	22.73%
Tobacco Products	34	4	1	25.00%
Recreation	92	24	1	4.17%
Entertainment	220	45	10	22.22%
Printing and Publishing	205	33	7	21.21%
Consumer Goods	348	56	12	21.43%
Apparel	169	32	8	25.00%
Healthcare	257	57	18	31.58%
Medical Equipment	566	122	10	8.20%
Pharmaceutical Products	944	232	48	20.69%
Chemicals	564	91	46	50.55%
Rubber and Plastic Products	126	28	9	32.14%
Textiles	39	7	3	42.86%
Construction Materials	536	104	30	28.85%
Construction	685	124	60	48.39%
Steel Works Etc	328	55	24	43.64%
Fabricated Products	23	8	2	25.00%
Machinery	798	139	42	30.22%
Electrical Equipment	185	36	11	30.56%
Automobiles and Trucks	497	86	23	26.74%
Aircraft	198	30	12	40.00%
Shipbuilding, Railroad Equipment	46	8	3	37.50%
Defense	32	7	1	14.29%
Precious Metals	403	84	76	90.48%
Non-Metallic and Industrial Metal Mining	382	76	55	72.37%
Coal	70	17	11	64.71%
Petroleum and Natural Gas	949	164	119	72.56%
Utilities	985	148	113	76.35%
Communication	595	106	42	39.62%
Personal Services	252	51	12	23.53%
Business Services	2,347	530	107	20.19%
Computers	407	83	17	20.48%
Electronic Equipment	941	189	29	15.34%
Measuring and Control Equipment	314	59	3	5.08%
Business Supplies	230	44	18	40.91%
Shipping Containers	103	18	7	38.89%
Transportation	794	148	60	40.54%
Wholesale	676	130	33	25.38%
Retail	1,261	225	57	25.33%
Restaurants, Hotels, Motels	397	78	18	23.08%
Banking	1,773	380	82	21.58%
Insurance	820	143	48	33.57%
Real Estate	384	88	30	34.09%
Trading	749	143	46	32.17%
Other	106	16	8	50.00%

Table 2. Firm, Industry, and Country Characteristics

This table reports descriptive statistics for the variables and observations used in our tests. The sample spans from 2011 to 2020 and includes 22,603 firm-year observations for 4,395 distinct firms. Panel A presents descriptive statistics for the main variables used in our tests. Panel B presents descriptive statistics separately for the subset of firms that use ESG metrics in executive compensation and those that do not use these metrics. See Appendix A for variable definitions.

Panel A. Pooled observations

Variable	#Obs.	Std Dev	P25	Median	Mean	P75
Volatility	22,603	9.79	19.83	25.01	26.98	32.22
Size	22,603	1.90	6.84	8.08	8.15	9.40
Log(BM)	22,603	0.82	-1.32	-0.78	-0.85	-0.30
ROA	22,603	0.13	0.01	0.04	0.03	0.08
Leverage	22,603	0.17	0.08	0.21	0.23	0.34
Tangibility	22,603	0.26	0.05	0.16	0.26	0.39
Dividends	22,603	0.60	0	0.27	0.36	0.54
Returns	22,603	0.50	-0.12	0.07	0.13	0.28
Institutional ownership	22,603	0.31	0.26	0.52	0.54	0.84
Larger IO	22,603	0.17	0.14	0.27	0.28	0.41
Longer Term IO	22,603	0.17	0.09	0.21	0.24	0.39
Foreign IO	22,603	0.12	0.05	0.10	0.13	0.17
ESG Disclosure mand.	22,603	0.45	0	0	0.28	1
Country ESG sensitivity	22,603	7.94	69.30	71.19	74.14	80
Controlling shareholder	22,603	0.31	0	0	0.11	0
Log(CO2)	22,603	2.97	8.32	10.19	10.23	12.04
Emission Pledge	22,603	0.10	0	0	0.01	0
ESG Rating(Refinitiv)	19,829	0.29	0.33	0.69	0.61	0.90
ESG Rating (Sustainalytics)	17,809	10.17	49	55.88	57.51	64.63
ESG Rating (KLD)	1,564	3.43	0	1	2.20	4
ESG Metric	22,603	0.37	0	0	0.17	0
Carbon-Specific metric	22,603	0.11	0	0	0.01	0
Non Carbon-specific metric	22,603	0.36	0	0	0.15	0
Pct Independent	19,882	20.32	61.54	77.78	71.82	87.50
Pct Female	19,885	12.35	11.11	20	20.14	28.57
Pct Peer ESG Pay	22,603	7.64	1.22	3.55	6.67	9.77
Abnormal Compensation	20,258	5.42	-0.87	0.93	2.85	4.63
Log(Variable_Comp)	18,441	1.16	12.83	13.58	13.49	14.28

Table 2. Firm, Industry, and Country Characteristics (cont'ed)

Panel B. Partitioning by ESG Pay

	ESG Metric = 1		*ESG Metric* = 0		Difference in means
Variable	Mean	Median	Mean	Median	(p-value)
Volatility	26.46	24.21	27.09	25.13	-0.63***
Size	8.73	8.74	8.03	7.97	0.70***
Log(BM)	-0.59	-0.55	-0.91	-0.83	0.31***
ROA	0.02	0.03	0.03	0.04	-0.01***
Leverage	0.26	0.26	0.22	0.20	0.04***
Tangibility	0.43	0.42	0.22	0.14	0.21***
Dividends	0.43	0.36	0.35	0.26	0.08***
Returns	0.09	0.03	0.14	0.07	-0.05***
Institutional ownership	0.48	0.42	0.55	0.54	-0.07***
Larger IO	0.26	0.25	0.28	0.28	-0.02***
Longer Term IO	0.21	0.17	0.25	0.22	-0.04***
Foreign IO	0.18	0.14	0.13	0.09	0.05***
ESG Disclosure mand.	0.41	0	0.26	0	0.15***
Country ESG sensitivity	75.13	74.90	73.94	71.19	1.20***
Controlling shareholder	0.10	0	0.11	0	0.003
Log(CO2)	11.95	11.80	9.89	9.92	2.05***
Emission Pledge	0.03	0	0.01	0	0.02***
ESG Rating(Refinitiv)	0.73	0.84	0.59	0.64	0.14***
ESG Rating(Sustainalytics)	64.14	63.55	58.79	57.65	5.34***
ESG Rating(KLD)	2.46	2	1.83	1	0.63***
ESG Metric	1	1	0	0	-
Carbon-Specific metric	0.08	0	0	0	-
Non Carbon-specific metric	0.92	1	0	0	-
Pct Independent	72.71	77.78	71.63	77.78	1.08***
Pct Female	23.77	23.08	19.37	18.18	4.40***
Pct Peer ESG Pay	14.30	13.23	5.16	2.65	9.15***
Abnormal Compensation	2.94	1.11	2.83	0.88	0.11
Log(Variable_Comp)	13.48	13.53	13.49	13.59	-0.02

Table 3. Contract Characteristics

This table describes variation in the characteristics of the compensation contracts that include ESG metrics. Panel A focuses on the types of ESG metrics used in the contracts. Panel B focuses on the types of compensation vehicles in which ESG metrics are included. Panel C presents the median values of the weights assigned to ESG metrics in short-term and long-term compensation vehicles.

Panel A. Types of ESG metrics:	**# firms**
a) Specific indicators[(1)]:	
Carbon emissions	172
Other environmental variables	651
Safety and security	824
Diversity and inclusion	285
Employee satisfaction and development	1,167
Governance and corporate culture	1,323
b) Scores[(2)]:	
Self evaluation (i.e., combination of metrics defined and measured by the firm)	884
External evaluation (i.e., scores defined and measured by external parties)	97
Panel B. Compensation vehicles with ESG metrics:	**# firms**
Short-term compensation (annual variable compensation)	1,321
Long-term compensation (long term incentive plans)	327
Both short-term and long-term compensation	233
Panel C. Weights	**% of comp.**
Short-term compensation	13.2%
Long-term compensation	15.9%

Notes:

(1) Refers to the number of firms that include the corresponding type of metric in the compensation contract. Firms often include several types of metrics in the contract.

(2) Restricted to the companies that use distinctive environmental metrics in the compensation contract.

Table 4. Determinants of Linking Pay to ESG

This table reports estimates from the analysis of determinants of use of ESG metrics in executives' compensation contracts. The dependent variable, *ESG Pay*, is and indicator variable that equals one if the company incorporates any ESG metrics in executive compensation contracts in that year, and zero otherwise. The rest of the variables are defined in Appendix A. Independent variables are measured at the end of the prior year. The sample spans from 2011 to 2020 and includes 22,603 firm-year observations. Standard errors are clustered at the firm level. *t*-statistics are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels (two-tail) respectively. Intercepts are omitted.

Panel A. Industry- and country-level variation

	Dependent Variable: *ESG Pay*						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Industry with Significant Environmental Footprints						0.265***	
						(13.548)	
ESG Disclosure Mandate						0.098***	0.065***
						(6.725)	(6.516)
Country ESG sensitivity						0.008***	0.002***
						(6.520)	(2.896)
Year FE	YES			YES		YES	YES
Industry FE		YES		YES			YES
Country FE			YES	YES		YES	
Industry-year FE					YES		
Country-year FE					YES		
R^2	0.04	0.16	0.06	0.25	0.31	0.17	0.23
# Obs.	22,603	22,603	22,603	22,603	22,593	22,603	22,603

Panel B. Firm-level variation

	Dependent Variable: *ESG Pay*				
	(1)	(2)	(3)	(4)	(5)
Log(CO2)	0.013***				0.013***
	(4.64)				(4.08)
Volatility	0.001**				0.001***
	(2.46)				(2.63)
Size	0.029***				0.015***
	(8.65)				(3.14)
Log(BM)	0.004				0.007
	(0.87)				(1.32)
ROA	-0.064***				-0.081***
	(-2.93)				(-2.99)
Leverage	-0.057***				-0.038
	(-2.76)				(-1.57)
Tangibility	0.122***				0.140***
	(4.66)				(4.58)
Dividends	0.017***				0.020***
	(3.73)				(3.68)
Returns	0.004				0.008
	(0.74)				(1.43)
Emission Pledge		0.143***			0.116***
		(3.82)			(3.13)
ESG Rating (Refinitiv)		0.184***			0.057***
		(12.67)			(2.79)
Institutional ownership			0.129***		0.051**
			(6.59)		(2.02)
Controlling shareholder			-0.049***		-0.033**
			(-3.85)		(-1.97)

Pct Peer ESG Pay			0.015***		0.012***
			(14.08)		(8.49)
Pct Independent				0.002***	0.001***
				(6.74)	(3.35)
Pct Female				0.003***	0.001***
				(7.70)	(3.64)
Abnormal Compensation					0.0001
					(0.07)
Year FE	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES
Country FE	YES	YES	YES	YES	YES
R^2	0.28	0.27	0.26	0.28	0.30
# Obs.	22,603	19,829	22,603	19,882	17,921

Table 5. Engagements by the Big Three

This table reports estimates from the analysis of the association of ESG pay with engagements by the Big Three with their portfolio firms. *ESG Pay* is an indicator variable that equals one if the company incorporates any ESG criteria in executive compensation contracts in that year, and zero otherwise. *Engagement by at least one Big Three* is and indicator variable that equals one if BlackRock, State Street, or Vanguard engage with the firm, and zero otherwise. *Engagement by BlackRock* is and indicator variable that equals one if BlackRock engages with the firm, and zero otherwise. *Engagement by StateStreet* is an indicator variable that equals one if State Street engages with the firm about Environmental/Social issues, and zero otherwise. *Engagement by Vanguard* is and indicator variable that equals one if Vanguard engages with the firm about "Oversight of strategy and risk" (which includes environmental issues), and zero otherwise. The rest of the variables are defined in Appendix A. Independent variables are measured at the start of the year. Standard errors are clustered at the firm level. *t*-statistics are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels (two-tail) respectively. Intercepts are omitted.

Dependent variable:	*ESG pay*			
	(1)	(2)	(3)	(4)
Engagement by at least one Big Three	0.05***			
	(4.99)			
Engagement by BlackRock		0.04***		
		(3.53)		
Engagement by StateStreet			0.03*	
			(1.67)	
Engagement by Vanguard				0.02
				(1.26)
Size	0.04***	0.04***	0.03***	0.05***
	(13.73)	(14.52)	(9.92)	(15.12)
Log(BM)	0.01	0.01	0.01**	0.01
	(1.38)	(1.63)	(2.01)	(1.06)
ROA	-0.08***	-0.13***	-0.08***	-0.15***
	(-4.02)	(-5.37)	(-2.79)	(-5.45)
Leverage	-0.05**	-0.04*	-0.07***	-0.04
	(-2.25)	(-1.71)	(-2.67)	(-1.28)
Tangibility	0.15***	0.14***	0.15***	0.14***
	(5.24)	(4.72)	(4.51)	(3.96)
Dividends	0.02***	0.03***	0.01**	0.02***
	(3.38)	(3.50)	(2.05)	(2.63)
Return	0.01	0.00	0.01*	0.01
	(1.39)	(0.36)	(1.80)	(0.84)
Year FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
Country FE	YES	YES	YES	YES
R^2	0.29	0.32	0.29	0.34
# Obs.	19,024	10,628	12,374	7,384

Table 6. Shareholder Voting

This table reports estimates from the analysis of the association of ESG pay and shareholder voting. In column (1) *Voting_Support* is the average percentage of favourable votes in the election of directors. In column (2) *Voting_Support* is the percentage of favourable votes in compensation-related proposals. In column (3) *ISS_Recommendation* is the fraction of directors for whom ISS recommends voting in favor. In column (4) *ISS_Recommendation* is one if ISS recommends voting in favor of the compensation proposal, and zero otherwise. *ESG Pay* is and indicator variable that equals one if the company incorporates any ESG criteria in executive compensation contracts in that year, and zero otherwise. The rest of the variables are defined in Appendix A. Independent variables are measured at the start of the year. The sample spans from 2011 to 2020 for US firms and from 2013 to 2020 for non-US firms. Standard errors are clustered at the firm level. *t*-statistics are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels (two-tail) respectively. Intercepts are omitted.

Dep. Variable:	*Voting_Support*		*ISS_Recommendation*	
	Director elections	Compensation proposals	Director elections	Compensation proposals
Indep. Var.:	(1)	(2)	(3)	(4)
ESG Pay	0.72**	0.79*	0.025***	0.025**
	(2.24)	(1.67)	(3.34)	(2.34)
Pct Independent	0.05***	0.03*	0.004***	0.002***
	(3.25)	(1.80)	(9.88)	(5.32)
Pct Female	0.06***	0.06***	0.001***	0.002***
	(5.75)	(3.48)	(2.86)	(4.45)
Abnormal Compensation	-0.97***	-8.86***	-0.020**	-0.200***
	(-3.24)	(-17.04)	(-2.25)	(-17.66)
Size	0.57***	1.79***	0.009***	0.049***
	(4.61)	(9.80)	(2.73)	(11.84)
Log(BM)	-0.36**	-1.76***	0.008	-0.036***
	(-2.50)	(-6.52)	(1.45)	(-6.43)
ROA	3.82***	7.85***	0.166***	0.116***
	(5.01)	(5.21)	(6.03)	(3.09)
Leverage	0.90	-4.05***	0.026	-0.132***
	(1.48)	(-3.66)	(1.26)	(-4.95)
Tangibility	0.28	2.05*	-0.003	0.028
	(0.40)	(1.86)	(-0.13)	(1.06)
Dividends	0.25	0.53**	0.002	0.005
	(1.49)	(2.17)	(0.59)	(0.84)
Returns	0.21	1.25***	-0.005	0.008
	(1.17)	(3.00)	(-0.80)	(0.86)
Industry FE	YES	YES	YES	YES
Country FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
R^2	0.84	0.19	0.19	0.14
# Obs.	11,550	10,857	11,658	10,962

Table 7. Changes in Institutional Investment

This table reports estimates from the analysis of the association between ESG pay and investors' changes in ownership in the company. The dependent variable Δ *Fund Ownership* is the fractional change in the number of a firm's shares owned by a particular institutional investor. *ESG Pay* is and indicator variable that equals one if the company incorporates any ESG metrics in executive compensation contracts in that year, and zero otherwise. The test is conducted at the fund-firm-year level. The rest of the variables are defined in Appendix A. Independent variables are measured at the start of the year. Standard errors are clustered at the fund-year level. *t*-statistics are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels (two-tail) respectively. Intercepts are omitted.

Dependent Variable:	Δ *Fund_Ownership*		
	(1)	(2)	(3)
ESG Pay	0.009***	0.019***	0.016***
	(4.58)	(13.33)	(10.38)
Size	-0.015***	-0.005***	-0.000
	(-13.60)	(-7.87)	(-0.01)
Log(BM)	0.012***	0.004***	0.021***
	(7.47)	(4.89)	(12.68)
ROA	0.078***	0.047***	-0.006
	(8.06)	(6.12)	(-0.59)
Leverage	0.013***	-0.001	0.018**
	(3.62)	(-0.41)	(2.32)
Tangibility	0.014***	0.008***	-0.084***
	(5.11)	(4.02)	(-8.17)
Dividends	-0.006***	-0.009***	-0.003***
	(-5.30)	(-13.22)	(-4.82)
Return	-0.034***	-0.045***	-0.070***
	(-15.02)	(-21.69)	(-35.48)
Year FE	YES	YES	n.a
Fund FE	NO	YES	n.a
Firm FE	NO	NO	YES
Fund-Year FE	NO	NO	YES
R^2	0.001	0.138	0.360
# Obs.	11,022,535	11,021,041	11,008,616

Table 8. ESG Pay and ESG debt instruments

This table reports estimates from the analysis of the association between ESG pay and the use of ESG debt instruments. In Panel A, *ESG-linked Loan* is an indicator variable that equals one if in that year the company takes a loan with interest rate linked to a particular ESG metric, and zero otherwise, and *Green Loan* is an indicator variable that equals one if in that year the company takes a loan dedicated to finance a particular environmentally friendly project in that year, and zero otherwise. In Panel B, *ESG-linked Bonds* is an indicator variable that equals one if in that year the company issues bonds with coupon rate linked to a particular ESG metric, and zero otherwise and *Green Bonds* is an indicator variable that equals one if in that year the company issues bonds dedicated to finance a particular environmentally friendly project, and zero otherwise. *ESG Pay* is an indicator variable that equals one if the company incorporates any ESG metrics in executive compensation contracts in that year, and zero otherwise. The rest of the variables are defined in Appendix A. Independent variables are measured at the start of the year. Standard errors are clustered at the firm level. *t*-statistics are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels (two-tail) respectively. Intercepts are omitted.

Panel A. Bank loans

	Dep. Var.: *ESG-linked Loan*		Dep. Var.: *Green Loan*	
Indep. Var.:	(1)	(2)	(3)	(4)
ESG Pay	0.01***	0.01***	-0.00	-0.00
	(4.03)	(2.82)	(-0.30)	(-0.85)
Size	0.00***	-0.00	0.00***	-0.00***
	(7.33)	(-1.52)	(2.69)	(-2.79)
Log(BM)	-0.00*	-0.00	0.00	0.00
	(-1.67)	(-0.33)	(0.07)	(0.33)
ROA	-0.01**	-0.00	-0.00	0.00**
	(-2.38)	(-0.08)	(-1.48)	(1.96)
Leverage	-0.00	-0.00	-0.00	-0.00
	(-0.45)	(-0.22)	(-0.29)	(-0.41)
Tangibility	0.01	0.01	0.01	0.00
	(1.63)	(0.32)	(1.46)	(0.88)
Dividends	0.00	0.00	-0.00	0.00
	(1.04)	(0.69)	(-1.14)	(0.39)
Returns	0.00	0.00	0.00	0.00
	(1.04)	(0.95)	(0.96)	(0.86)
Industry FE	YES	n.a	YES	n.a
Country FE	YES	n.a	YES	n.a
Firm FE	NO	YES	NO	YES
Year FE	YES	YES	YES	YES
R^2	0.04	0.21	0.02	0.21
# Obs.	22,603	22,012	22,603	22,012

Table 8. ESG Pay and Sustainable Finance (cont'ed)

Panel B. Corporate bonds

	Dep. Var.: *ESG-linked Bonds*		Dep. Var.: *Green Bonds*	
Indep. Var.:	(1)	(2)	(3)	(4)
ESG Pay	0.003**	0.007***	0.012***	0.017***
	(1.98)	(2.62)	(2.84)	(3.69)
Size	0.001***	-0.003	0.008***	-0.009***
	(3.19)	(-1.62)	(8.53)	(-2.96)
Log(BM)	0.000	-0.001	-0.000	-0.004*
	(0.00)	(-0.89)	(-0.03)	(-1.69)
ROA	0.000	0.004	-0.012***	0.007
	(0.27)	(0.86)	(-3.73)	(1.61)
Leverage	0.004**	0.004	-0.008	-0.047***
	(1.99)	(0.75)	(-1.61)	(-4.21)
Tangibility	-0.005**	-0.022**	0.023***	-0.018
	(-2.09)	(-2.30)	(2.66)	(-1.05)
Dividends	0.001	0.000	-0.001	0.001
	(0.77)	(0.46)	(-0.62)	(0.55)
Returns	0.001	0.000	0.004***	0.001
	(1.62)	(0.53)	(2.66)	(0.53)
Industry FE	YES	n.a	YES	n.a
Country FE	YES	n.a	YES	n.a
Firm FE	NO	YES	NO	YES
Year FE	YES	YES	YES	YES
R^2	0.02	0.21	0.08	0.35
# Obs.	22,603	22,012	22,603	22,012

Table 9. ESG Performance

This table reports estimates from the analysis of the association between ESG pay and ESG performance. In Panel A, the dependent variable Δ CO2 is defined as the year-to-year change in the firms' direct GHG emissions (measured in tons of CO2 equivalent). In Panel B, the dependent variable Δ *ESG Rating* is the year-to-year changes in ESG ratings/scores provided by Refinitiv, Sustainalytics, and KLD (MSCI). *ESG Pay* is and indicator variable that equals one if the company incorporates any ESG metrics in executive compensation contracts in that year, and zero otherwise. In column (2) *ESG Pay* is replaced with indicator variables for the types of ESG metrics listed in Table 3. The rest of the variables are defined in Appendix A. Independent variables are measured at the start of the year. Standard errors are clustered at the firm level. *t*-statistics are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels (two-tail) respectively. Intercepts are omitted.

Panel A. GHG emissions

Dependent Variable:	Δ CO2	
	(1)	(2)
ESG Pay	-0.07	
	(-0.85)	
Carbon emissions		-0.70***
		(-2.73)
Other environmental variables		-0.07
		(-0.58)
Safety and security		-0.04
		(-0.29)
Diversity and inclusion		-0.01
		(-0.11)
Employee satisfaction and development		-0.06
		(-0.47)
Governance and corporate culture		0.00
		(0.00)
Size	-0.09	-0.10
	(-1.46)	(-1.61)
Log(BM)	-0.02	-0.02
	(-0.54)	(-0.48)
ROA	0.18*	0.19**
	(1.86)	(1.96)
Leverage	0.27	0.28
	(1.54)	(1.59)
Tangibility	0.57	0.57
	(1.60)	(1.61)
Dividends	0.00	0.00
	(0.11)	(0.09)
Returns	0.00	0.01
	(0.16)	(0.22)
Year FE	YES	YES
Firm FE	YES	YES
R^2	0.15	0.15
# Obs.	21,715	21,715

Table 9. ESG Performance (cont'ed)

Panel B. ESG Ratings

Dependent variable:	Δ *ESG Rating (Refinitiv)*		Δ *ESG Rating (Sustainalytics)*		Δ *ESG Rating (KLD)*	
	(1)	(2)	(3)	(4)	(5)	(6)
ESG Pay	-0.00		0.23*		1.00**	
	(-0.17)		(1.95)		(2.42)	
Carbon emissions		-0.00		-0.57*		7.26***
		(-0.07)		(-1.95)		(8.00)
Other environmental variables		-0.00		-0.05		-0.53
		(-0.13)		(-0.28)		(-0.60)
Safety and security		-0.00		0.18		0.68
		(-0.59)		(0.95)		(1.41)
Diversity and inclusion		0.03***		0.08		2.44**
		(3.58)		(0.29)		(2.02)
Employee satisfaction and development		-0.00		0.20		1.29
		(-0.54)		(1.14)		(1.28)
Governance and corporate culture		-0.00		0.05		1.48*
		(-0.48)		(0.23)		(1.84)
Size	0.00	0.00	0.39***	0.37***	0.92	1.02
	(1.15)	(1.19)	(3.17)	(2.96)	(1.35)	(1.49)
Log(BM)	-0.01***	-0.01***	0.04	0.05	-0.13	-0.14
	(-4.03)	(-4.01)	(0.43)	(0.54)	(-0.37)	(-0.39)
ROA	-0.11***	-0.11***	0.22	0.23	-2.80	-2.94
	(-7.58)	(-7.58)	(0.55)	(0.57)	(-1.13)	(-1.17)
Leverage	0.01	0.01	-0.42	-0.39	-1.92	-1.73
	(0.71)	(0.69)	(-0.99)	(-0.92)	(-1.03)	(-0.93)
Tangibility	-0.03*	-0.03	-0.51	-0.48	4.65	5.23
	(-1.69)	(-1.62)	(-0.78)	(-0.75)	(1.37)	(1.54)
Dividends	-0.01***	-0.01***	0.05	0.05	0.09	0.06
	(-5.73)	(-5.80)	(0.98)	(0.97)	(0.54)	(0.36)
Returns	-0.00	-0.00	-0.19**	-0.18**	0.08	0.11
	(-0.18)	(-0.20)	(-2.48)	(-2.43)	(0.31)	(0.38)
Year FE	YES	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES	YES
R^2	0.25	0.25	0.20	0.20	0.22	0.23
# Obs.	19,252	19,252	17,148	17,148	1,351	1,351

Table 10. ESG Performance by Geographic Area

This tables reports estimates from repeating the analyses in Table 9 across different geographic regions. Europe refers to 16 countries of Western Europe (see Table 1). ROW (Rest of the World) refers to Australia, Canada, New Zealand, and South Africa. The empirical specifications are as in Table 9. Independent variables are measured at the start of the year. Standard errors are clustered at the firm level. *t*-statistics are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels (two-tail) respectively. Intercepts are omitted.

	Δ *CO2*			Δ *ESG Rating*		
	Europe	USA	ROW	Europe	USA	ROW
	(1)	(2)	(3)	(4)	(5)	(6)
ESG Pay	-0.19*	0.12	-0.06	0.01*	0.00	-0.01
	(-1.94)	(0.58)	(-0.78)	(1.84)	(0.49)	(-1.21)
Controls	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES	YES
R^2	0.19	0.12	0.15	0.30	0.12	0.28
# Obs.	7,577	10,801	3,337	6,125	9,801	3,074

Table 11. Financial Performance

This table reports estimates from the analysis of the association between ESG pay and financial performance. In columns (1) and (2), the dependent variable Δ *ROA* is defined as the year-to-year change in the firms' return on assets (measured as income scaled by total assets). In columns (3) and (4), the dependent variable *Return* is the stock return compounded over the year. *ESG Pay* is and indicator variable that equals one if the company incorporates any ESG metrics in executive compensation contracts in that year, and zero otherwise. In columns (2) and (4) *ESG Pay* is replaced with indicator variables for the types of ESG metrics in Table 3. The rest of the variables are defined in Appendix A. Independent variables are measured at the start of the year. Standard errors are clustered at the firm level. *t*-statistics are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels (two-tail) respectively. Intercepts are omitted.

Dependent Variable:	Δ *ROA*		*Return*	
	(1)	(2)	(3)	(4)
ESG Pay	-0.003		-0.032*	
	(-0.94)		(-1.82)	
Carbon emissions		-0.02**		-0.09***
		(-2.11)		(-2.74)
Other environmental variables		0.01*		0.02
		(1.82)		(0.93)
Safety and security		-0.01*		-0.04
		(-1.70)		(-1.36)
Diversity and inclusion		0.01		-0.00
		(1.29)		(-0.10)
Employee satisfaction and development		0.00		0.02
		(0.41)		(0.80)
Governance and corporate culture		-0.00		-0.05**
		(-0.67)		(-2.25)
Controls	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
R^2	0.50	0.50	0.34	0.34
# Obs.	22,011	22,011	22,012	22,012

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